Palm Oil Handbook

Commodities and Export Projections Division
Economic Analysis and Projections Department

November 1981

TECHNICAL CONVERSION FACTORS

	Meal yield	Oil yield
	(%)	
Palm kernels	52.5	46.5

Source: FAO, Technical Conversion Factors for Agricultural Commodities, Rome, 1972.

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I. INTRODUCTION *

After a period of slow growth between 1955-1965, world production of palm oil has been expanding rapidly since the late 1960s. In line with the increasing trend of output, world trade in palm oil more than doubled between 1969 and 1979. About 90 percent of palm oil exports go to markets in industrialized countries, but exports to new markets in developing countries have shown the most rapid growth. Indonesia, Ivory Coast and Malaysia now account for the bulk of total world export of palm oil, with Malaysia contributing a very large portion of that total in 1981.

This rapid expansion of international trade in palm oil has been enhanced, in part, by the growth of processing in some of the producing areas. The successful establishment and growth of a processing industry in Malaysia in the last five years, for example, has meant that an increasing larger proportion of palm oil exports is now in refined or fractionated form and this has helped widen the end-uses of palm oil and facilitated the penetration of new markets, particularly in Asia and in Eastern Europe.

The most rapid increases in the consumption of palm oil during the last two decades have been in the industrialized countries—especially in Germany, the Netherlands and the United Kingdom. Together these countries have been importing about 60 percent of the palm oil traded internationally. The United States has become an important consumer only in the last few years.

Following the market condition of most other fats and oils, prices of palm oil and palm kernel oil have been fluctuating widely for sometime. Since most fats and oils are interchangeable, end-users tend to substitute one oil for another. Consequently, prices of individual fats and oils are largely determined through the simultaneous interaction of supplies and demands for all fats and oils in international markets.

Although palm oil production and trade are expected to continue to expand, competition from other fats and oils is likely to remain keen.

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*This is the first of a number of handbooks on specific fats and oils. This Handbook should be read in conjunction with the Fats and Oils Handbook.

II. THE PRODUCT

A. Physical Characteristics

The oil palm produces two kinds of oils, palm oil and palm kernel oil. Palm oil contains almost the same fatty acids as other fats and oils. Palm kernel oil is closely akin to coconut oil. Both oils compete with other vegetable oils and with animal and marine oils and fats for edible and industrial uses.

One important characteristic of fats and oils is the extent to which their fatty acids are saturated. Oils with a high degree of unsaturated fatty acids--for example, soybean oil--are generally liquid at room temperature in temperate climates, and are thus called "soft" oils. Oils or fats with a large proportion of saturated fatty acids, such as palm oil, are usually solid or semisolid. 1/ It is the degree of unsaturation that largely determines the ultimate use of a given fat or oil.

Palm oil and other vegetable fats and oils tend to melt between 20° to 30° C (68° and 95° F). They have relatively low iodine values and consist of glycerides containing high percentages of such saturated acids as lauric, myristic, and palmitic. Fats from fruits of many members of the palm family, notably coconut and babassu oils, contain large amounts of combined lauric acid. Because of such complex mixtures of glycerides, each of which has a different melting point, fats and oils have no distinct melting points or solidifying points. 2/

Palm oil and palm kernel oil, like other fats and oils are insoluble in water and, with the exception of castor oil, are insoluble in cold alcohol. However, most fats are soluble in ether, carbon disulfide, chloroform, carbon tetrachloride, petroleum benzine, and benzene.

Table II-A1 represents a summary of some of the major characteristics of selected fats and oils. The principal acids from palm oil are stearic and palmitic while palm kernel oil contains lauric acid. The solidification point for palm oil ranges from 24° to 30° C and that for palm kernel oil is between 19° and 30° C.

1/ IBRD, Commodity Paper No. 23, 1976.
2/ For more details see Fats and Oils Handbook.

Table II-A1: SOME TECHNICAL CHARACTERISTICS OF FATS AND OILS

Fat/Oil	Main Fatty Acid	Iodine Number	Solidification Point (Centigrade)
Soybean Oil	Linoleic	121-142	-18 to -8
Sunflower Oil	Linoleic	115-135	-19 to -16
Groundnut Oil	Oleic	84-105	-2 to 3
Cottonseed Oil	Linoleic	101-107	2 to 4
Rapeseed Oil	Linoleic	94-105	0
Olive Oil	Oleic	78-95	-9 to 0
Palm Oil	Stearic/Palmitic	44-56	24 to 30
Coconut Oil	Lauric	7-10	14 to 25
Palm kernel Oil	Lauric	16-23	19 to 30
Fish Oil	Linoleic	110-180	-4 to 24
Tallow	Stearic/Palmitic	45-55	30 to 38
Lard	Stearic/Palmitic	58-77	22 to 32

Source: IBRD

B. Methods of Extraction (Production)

Most oil palms start to bear fruits in about two and a half to three years after planting. For unimpeded growth and high yields to take place, climatic and soil conditions must be favorable. Oil palm thrives well on flat to gently undulating clay soils. Where soils are not sufficiently fertile, fertilizers are often applied to improve yields. One hectare of oil palm can take up as much as 42 kg of fertilizer 1/ Plenty of sunshine and well-distributed rainfall averaging about 2,000 mm per year are also a pre-requisite.

Depending on the variety of palm seedling planted and the level of maintenance, minimum yields of about 2.5 tons of fresh fruit bunches (ffb) per hectare which provide about 200 to 225 kg of palm oil and around 135 kg of kernels can be expected. Table II-B1 shows possible yields by age of tree when the high yielding varieties (D by P palms) are planted. To ensure high

1/ IBRD, Report No. 1160-PNG, 1976, p. 13.

grade oil, the fresh fruit bunches must be carried (usually by trucks) to mills for processing soon after they are harvested.

Extraction of Oils: Fats and oils may be recovered from oil-bearing tissues by two main methods--rendering and pressing. The crudest method of rendering oil from oleaginous fruit consists of heaping them in piles, exposing them to the sun and collecting the oil that exudes. In somewhat improved form, this process is used in the preparation of palm oil; the fresh palm fruits are boiled in water and the oil is skimmed from the surface.

With many oil-bearing seeds and nuts, rendering will not sufficiently liberate the oil from the cellular structures in which it is held. In such cases, the cell walls are broken down by grinding, flaking, rolling, or pressing under high pressures to liberate the oil.

The technology for extracting oils from seeds and nuts has been evolving over several centuries. There have been many transitions from traditional, labor-intensive presses to modern labor-saving machines. The most traditional application of pressing technique consists in the crushing of (oil palm) seeds in mortars until oil exudes.

The Dutch or Stampee press invented in the 17th century was used almost exclusively in Europe for pressing oilseeds until the early part of the 19th century, when the hydraulic press was developed. The yield of oil from the hydraulic press was considerably higher than that from earlier processing methods because of the much higher applied pressure.

The modern screw press later replaced many of the hydraulic presses because it is a continuous process, has greater capacity, will normally remove more oil and requires less labor.

The general sequence of modern operations in pressing oilseeds and nuts is as follows: (1) the seeds are passed over magnetic separators to remove any stray bits of metal, (2) if necessary, the shells or hulls are removed; (3) the kernels are converted to coarse meal by grinding them between grooved rollers or with special types of hammer mills; and (4) they are pressed in hydraulic or screw presses with or without preliminary heating, depending on the oil-bearing material and the quality of oil desired.

Table II-B1: OIL PALM YIELDS*

Age of Tree Years After Planting	FFB (MT/acre)	Oil in FFB (Percent)	Oil (MT/acre)	Kernel in FFB (Percent)	Kernel (MT/acre)	Palm kernel Oil /a (MT/acre)	Total Oil (MT/acre)	Palm kernel Cake /b (MT/acre)
3	2.40	15.00	0.360	3.6	0.086	0.040	0.400	0.042
4	4.80	16.50	0.792	3.9	0.187	0.088	0.880	0.091
5	7.75	17.75	1.376	4.2	0.326	0.153	1.702	0.158
6	8.95	19.25	1.723	4.5	0.403	0.191	1.914	0.195
7	10.00	20.00	2.000	4.5	0.450	0.222	2.222	0.218
8	10.50	21.50	2.258	4.5	0.473	0.251	2.509	0.229
9	10.50	22.00	2.310	4.5	0.473	0.257	2.567	0.229
10	10.30	22.00	2.266	4.5	0.464	0.252	2.518	0.225
11	10.10	22.00	2.222	4.5	0.455	0.247	2.469	0.221
12	9.90	22.00	2.178	4.5	0.446	0.242	2.420	0.216
13	9.70	22.00	2.131	4.5	0.437	0.237	2.371	0.212
14	9.50	22.00	2.090	4.5	0.428	0.232	2.322	0.208
15	9.30	22.00	2.046	4.5	0.419	0.227	2.273	0.203
16	9.10	22.00	2.002	4.5	0.410	0.222	2.224	0.199
17	9.80	22.00	1.958	4.5	0.401	0.218	2.176	0.195
18	8.70	22.00	1.914	4.5	0.392	0.213	2.127	0.190
19	8.50	22.00	1.870	4.5	0.383	0.208	2.078	0.186
20	8.30	22.00	1.826	4.5	0.374	0.203	2.029	0.181
21	8.10	22.00	1.782	4.5	0.365	0.198	1.980	0.177
22	7.90	22.00	1.738	4.5	0.356	0.193	1.931	0.172
23	7.70	22.00	1.694	4.5	0.347	0.188	1.882	0.168
24	7.50	22.00	1.650	4.5	0.338	0.183	1.833	0.164
25	7.30	22.00	1.606	4.5	0.329	0.178	1.784	0.160

* Yields are based on estates planted with higher yielding varieties (D by P palms), 60 palms per acre.

/a Assuming a ratio of palm oil to palm kernel oil of 90:10.
/b Assuming a yield of 48.5 tons of cake per 100 MT of palm kernels.

Source: IBRD.

A technique that supplements operations involving presses is the use of solvents. Cakes obtained by pressing procedures still retain a substantial percentage of residual oil. Such residual oil can be removed with solvents.

The Problem of Pests: One major problem faced by farmers in certain palm oil producing areas is how to control pests that adversely affect the growth and hence the yield of oil palms. Since poor yields translate into reduced supply of oil palm products, some measures of combating diseases and pests are already available. After planting, the young oil palm seedlings are increasingly sprayed with special chemicals. The purchase of chemicals and spraying equipments obviously add to oil palm project costs.

C. Various End-Uses:

Palm oil and palm kernel oil have been used for both food and non-food purposes. In West Africa, for example, palm oil has traditionally been used in the preparation of food. In most industrialized countries, palm oil was used only for industrial purposes until recently. However, improved fractioning techniques have allowed it to compete with other fats and oils in the manufacture of margarines, shortenings, salad oils, confectionery and ice cream. 1/

In addition, palm oil is an important ingredient in the manufacture of soaps and candles and is still widely used in the tinplate industry. Its extensive use in the manufacture of soaps and in the preparation of fatty acids for industrial applications is attributed to the property that fats are hydrolyzed quite readily.

Like many oilseeds, palm kernel meal can be used in animal feeds.

1/ IBRD, Commodity Paper No. 23, 1976.

D. Marketing of the Product

Marketing of oil palm products is a complex process. Government intervention at some stage of the production and marketing process is a common feature in most exporting countries. In some West African countries the export trade is the monopoly of marketing boards. By monopolizing exports and dealing directly with importers, these organizations can strengthen their bargaining position. This influence is, however, relatively limited because of the extensive degree of interchangeability of many oils and the existence of numerous suppliers of any one kind.

Nearly all of the palm oil sold is on forward contract with brokers, selling agents, state trading agencies and independent dealers being involved. A market-clearing price is determined as the buyers and sellers make bids and counter bids.

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III. PRODUCTION

A. Geographical Distribution

After a period of slow growth between 1955-1965, world production of palm oil expanded rapidly in recent years. The share of palm oil which constituted about 5 percent of global production of all fats and oils in 1970 rose to about 7 percent in 1975 and is expected to approach 15 percent in the early 1980s. 1/

Table III-A1 shows the major palm oil producing countries and regions as well as their shares in world palm oil production. Palm oil is produced mainly in Africa, Asia and Latin America. The key producers include Indonesia, Malaysia, Ivory Coast, Nigeria and Zaire.

Malaysia is the world's largest producer of palm oil. It accounted for 31.5 percent of world production between 1970 and 1974 but by 1979 its share of world output had increased to 33.6 percent. Besides Malaysia, Indonesia and Ivory Coast have increased their shares of palm oil output significantly. The share of the former grew from about 12 percent in 1974 to 13 percent in 1979 while that of the latter rose from 3.9 percent to 4.2 percent during the same period.

One traditional but important producer of palm oil that is losing its relative position internationally is Nigeria whose share in world output fell by 50 percent between 1964 and 1979. It is now a net importer of palm oil. The other is Zaire.

Although the relative shares of Latin American producers in world production are small and sometimes negligible, more and more countries are attempting to diversify their economies by cultivating oil palm. Colombia and Paraguay are already making some progress.

1/ IBRD, "Prospects And Structure of the World Fats And Oils Economy", 1979.

Table III-A1: PALM OIL PRODUCTION IN MAJOR PRODUCING COUNTRIES, FIVE-YEAR AVERAGES AND PERCENTAGE SHARES 1960-79

Country	1960-64		1965-69		1970-74		1975-79		1979
	'000 mt	Percent	'000 mt	Percent	'000 mt	Percent	'000 mt	Percent	'000 mt
Western Africa	763.64	59.93	750.98	53.88	995.23	43.02	855.2	36.4	1155.5
Nigeria	497.98	39.09	431.60	30.96	533.40	23.06	480.40	20.80	675.0
Ghana	32.20	2.53	49.20	3.53	61.00	2.64	20.30	0.86	15.0
Liberia	40.48	3.18	41.20	2.96	7.00	0.30	15.60	0.66	28.0
Sierra Leone	36.20	2.84	41.40	2.97	58.00	2.51	48.50	2.06	48.0
Dahomey	38.80	3.05	32.92	2.36	42.60	1.84	28.10	1.20	28.0
Ivory Coast	22.86	1.79	30.50	2.19	91.43	3.95	99.10	4.22	158.0
Togo	0.66	0.05	2.80	0.20	4.70	0.20	6.10	0.26	19.0
Cameroon	38.64	3.03	48.36	3.47	57.60	2.49	54.30	2.31	80.0
Central African Rep.	0.88	0.07	0.64	0.05	0.50	0.02	0.60	0.03	2.6
Congo, PR.	6.62	0.52	6.18	0.44	6.14	0.27	3.80	0.16	7.2
Eq. Guinea	3.12	0.24	3.96	0.28	4.16	0.18	4.10	0.17	4.7
Gabon	-	-	1.56	0.11	2.48	10.11	2.40	0.10	1.4
Gambia	1.42	0.11	2.08	0.15	2.02	0.09	2.20	0.09	2.8
Guinea	8.80	0.69	13.80	0.99	40.56	1.75	35.90	1.53	40.0
Guinea Bissau	6.40	0.50	8.00	0.57	8.00	0.35	4.40	0.19	4.8
Sao Tome/Principe	1.78	0.14	1.18	0.08	0.99	0.04	1.10	0.05	1.0
Angola	26.80	2.10	35.60	2.55	74.60	3.22	39.10	1.66	40.0
Eastern Africa	225.04	17.67	172.58	12.38	182.82	7.90	184.10	7.8	173.9
Tanzania	0.32	0.03	0.78	0.06	1.64	0.07	1.50	0.06	2.7
Burundi	1.00	0.08	1.00	0.07	1.00	0.04	1.00	0.04	1.2
Zaire	223.72	17.56	170.80	12.25	180.18	7.79	181.6	7.43	170.0
Latin America - Caribbean	27.67	2.18	53.48	3.84	92.15	3.98	90.20	3.80	149.3
Brazil	1.28	0.10	10.22	0.73	6.78	0.29	7.10	0.30	16.0
Colombia	0.01	0.00	9.72	0.70	38.62	1.67	36.30	1.54	62.1
Costa Rica	6.00	0.47	10.00	0.72	14.44	0.62	16.50	0.70	24.5
Ecuador	0.46	0.04	2.52	0.18	6.00	0.26	9.00	0.38	24.7
Honduras	1.12	0.09	1.40	0.10	7.28	0.32	5.20	0.22	10.5
Mexico	13.36	1.05	13.00	0.93	11.32	0.49	11.30	0.48	7.0
Paraguay	3.94	0.31	3.12	0.37	7.72	0.33	4.80	0.20	4.5
Venezuela	1.50	0.12	1.50	0.11	0.00	0.00	0.00	0.00	0.0
West Asia - Pacific	256.00	20.10	416.86	29.90	1,043.31	45.10	1,204.70	51.30	2,985.0
China Rep.	-	-	-	-	10.00	1.73	114.00	4.85	184.0
Indonesia	147.52	11.58	176.42	12.65	273.72	11.84	299.60	12.75	610.0
Malaysia	108.48	8.52	240.44	17.25	728.10	31.47	790.00	33.61	2,180.0
Philippines	-	-	-	-	1.49	0.06	1.10	0.05	11.0
Others	1.47	0.12				16.00	0.70	64.6	
World Total	1,273.82	100.00	1,393.90	100.00	2,313.52	100.00	2,350.20	100.00	4,528.3

Source: FAO, Production Yearbook.

World production of palm oil in the 1980s is expected to continue to increase as a result of new plantings/replantings undertaken by such countries as Papua New Guinea, Chile, Philippines, India, Indonesia, and Malaysia.

In terms of the decision to invest in oil palm estates or smallholdings, the high costs tend to relate to establishment, machinery (mills), labor and infrastructure. Estimated typical costs of establishing and operating a hectare of oil palm based on economic life of 30 years for oil palm trees are illustrated in Table III-A2 for Malaysia and these are compared to the costs of planting rubber under similar assumptions.

B. Some Factors Affecting Supply

One of the major factors affecting increasing supplies of palm oil has been the massive effort by the governments of many producing countries to establish oil palm estates, smallholdings and to replace wild groves with modern varieties. For example, it is indicated that despite recent higher world prices for Indonesia's major tree crop products, only oil palm has shown sustained large increases in production, due to investment programs by Government and private estates. 1/ The producers of palm oil, like other farmers, take into account the price at which they will sell their product. Their response to price is discussed in Section V-B.

1/ IBRD, Report No. 2939-IND, July, 1981.

FOR RUBBER AND PALM OIL
(in U.S. cents per kg)

RUBBER		PALM OIL	
Type of Cost	Amount	Type of Cost	Amount
Fixed:		Fixed: /d	
Total amortized /a	4.4	Settlement cost /e	4.4
		Administration	.7
		Mills	.4
	4.4		5.5
Variables:		Variables:	
Tapping	10.7	Maintenance	3.1
Cultivation /b	3.8	Fertilizer /f	3.3
Diseases and pests	.2	Diseases and pests	.4
Collection	15.0	Assisted polination	1.1
Processing	2.6	Processing	4.9
	32.3		12.8
Transportation:		Transportation:	
Plantation to port	3.7	Plantation to port	3.7
	3.7		3.7
Total	40.4 /c	Total	22.0 /c

/a Based on establishment costs of US $1,450 per hectare and an economic life of 30 years for rubber trees.
/b Includes weeding, draining, and fertilizer.
/c F.o.b. excluding export taxes.
/d Based on establishment costs of US $1,680 per hectare and economic life of 30 years for oil palm trees.
/e Includes felling and cleaning costs, construction, roads, and allocation for land input.
/f Computed from average fertilizer costs on FELDA schemes of US $10 per hectare per month.

Sources: Figures are averages based on surveys of private and Government plantations and mills in Malaysia.
USDA, The Palm Oil Industry in West Malaysia, June 1977.

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USDA, The Palm Oil Industry in West Malaysia, June, 1977.

IV. CONSUMPTION AND TRADE

A. Consumption

Since 1960 more than half of world palm oil output is consumed in producing countries. Regional consumption of fats and oils generally reflect regional production patterns and natural storage conditions. Economic protection and lower transport costs also play an important role in the preference for locally produced fats and oils. Thus traditional palm oil producing countries like Colombia, Ghana, Indonesia, Ivory Coast, Malaysia, Nigeria and Zaire have had long histories of consumption of the product.

The consumption of palm oil is now increasing in many non-producing developing countries. Substantial quantities of palm oil are currently being consumed in India and Pakistan, 1/ where palm oil was hardly known until a few years ago.

Industrialized countries account for more than half of world consumption of all fats and oils and have been the main export market for fats and oils produced in developing countries. Within the industrialized countries, the most rapid increases in the consumption of palm oil during the last two decades have been recorded in the Federal Republic of Germany, the Netherlands, and the United Kingdom. Together these countries have been importing about 60% of the palm oil traded internationally.

Unlike a number of industrialized countries which have been major consumers of palm oil for sometime, the United States has become an important consumer only in recent years. The growth in demand for palm oil in the United States seems to reflect movements in relative prices of other fats and oils. The use of vegetable oils in consumer products has increased at the expense of animal fats, as the latter's relative prices rose, and the price of palm oil declined, relative to those of other vegetable oils (see the section on prices). 2/

1/ India has recently started producing some palm oil.

2/ IBRD, Commodity Paper No. 23, 1976.

The industrialized countries also consume the largest part of palm kernel oil traded, with the United States being the only major market showing significant growth. Imports of palm kernel oil into developing countries for consumption have risen at a fast rate but remain less than 10% of the total. 1/

The consumption of palm oil has also increased in the centrally planned economies. Although China produces palm oil, its imports in 1979 amounted to 7% of all fats and oils imported and palm oil constituted 5% of all fats and oils consumed. The USSR and Eastern Europe also imported and consumed more palm oil in 1979 than previously. Table IV-A1 shows the share of palm oil in total imports and total apparent consumption in selected countries and economic regions in 1979.

In general, per capita consumption of fats and oils depends mainly on incomes. It is noted, therefore, that demand for fats and oils increases rapidly at low income levels. At high income levels--roughly those now reached in Japan, Western Europe and United States--the demand for fats and oils due to increases in income levels off at about 30 kg. per capita (see Section V-C on income elasticities of demand). 2/ Table IV-A2 points to high levels of consumption of all fats and oils in the industrialized countries while the levels for developing countries are relatively low.

1/ FAO, Palm Oil and Palm Kernel Oil in the World Fats and Oils Economy.

2/ IBRD, op. cit, p.II-1.

Table IV-A1: SHARE OF PALM OIL IN TOTAL IMPORTS AND TOTAL APPARENT CONSUMPTION IN SELECTED COUNTRIES AND COUNTRY GROUPS, 1979

Countries	Imports ('000 tonnes)			Apparent consumption ('000 tonnes)		
	Palm Oil	Total Fats & Oils	Share of Palm Oil (%)	Palm Oil	Total Fats & Oils	Share of Palm Oil (%)
Developing Countries	939	6,901	14	3,652	24,828	15
Algeria	4	286	1	4	308	1
Kenya	47	59	80	47	70	67
Morocco	4	245	2	4	287	1
Mexico	2	260	1	9	771	1
Venezuela	-	100	-	-	255	-
Egypt	-	456	-	-	623	-
Iraq	130	164	79	130	172	76
Iran	-	350	-	-	480	-
Saudi Arabia	30	80	38	30	80	38
Bangladesh	-	90	-	-	170	-
India	400	1,172	34	400	4,452	9
Pakistan	201	489	41	201	46	21
China	45	606	7	229	4,738	5
Developed Countries	1,206	11,024	11	1,206	32,009	4
U.S.A.	148	770	19	145	7,805	2
EEC	694	5,880	12	694	9238	8
Other Western Europe	70	989	7	70	2,984	2
Japan	139	1,705	8	139	2,143	6
USSR/E. Europe	109	1,209	9	109	8,453	1
World	2,145	17,925	12	4,858	56,837	9

Source: Food and Agriculture Organization, 1980.

Table IV-A2: PER CAPITA CONSUMPTION OF VISIBLE FATS IN SELECTED INDUSTRIALIZED AND DEVELOPING COUNTRIES, IN 1975

Countries	Per capita consumption of Visible Fats in Grams Per Day
Netherlands	72.0
United States of America	64.0
Sweden	56.0
Spain	48.0
Mexico	27.2
Japan	27.2
Malaysia	22.4
South Africa	19.2
Philippines	16.6
Nigeria	16.0
Brazil	14.4
Indonesia	9.6
India	8.8
Sri Lanka	8.0
Thailand	4.8

Source: American Oil Chemists Society Journal, Vol. 53, No.6, June 1976.

B. Exports and Imports

World exports of palm oil expanded rapidly during the last decade from about 860.9 thousand tons in 1969 to about 2,294.7 thousand tons in 1979. Tables IV-B1 and IV-B2 indicate the levels of exports of palm oil by major exporting countries and regions. Palm oil exports grew at an average rate of 13.1% a year. This growth rate is faster than that of any other major fat or oil exported during this period. Export of soybean and rapeseed oils increased at an annual rate of 9.1% and 6.7% respectively (Table IV-B3).

Malaysia is the leading world exporter of palm oil and its share of total world exports averaged 60% per annum between 1975 and 1979. 1/ In general, about 90% of world exports of palm oil go to industrialized countries. Given this direction and pattern of trade, Malaysia's major markets have been Canada, Germany FR, Japan, the Netherlands, the United Kingdom and the United States. Its principal markets in developing areas include India, Iraq, Pakistan and Singapore. Malaysia also exports large quantities of refined palm oil products (Table IV-B4).

Other important developing country exporters of palm oil are Indonesia, Ivory Coast, Papua-New Guinea, and Zaire. These countries compete for the traditional industrialized markets of Western Europe and North America. Indonesia's share of world exports was maintained at an annual rate of 18.4 percent between 1975 and 1979. The average annual share of world palm oil exports had been 3.8 percent for Ivory Coast, 4.9 percent for Nigeria and 1.2 percent for Papua-New Guinea during the same period.

At the close of the last decade the rate of growth of exports by Indonesia fell substantially and by 1980 the Ivory Coast emerged as a producer having the second largest growth rates of both production and export of palm oil (Table IV-B1). The Ivory Coast now accounts for almost all the export from Africa amounting to 5% of world exports.

1/ Market share computed from Table IV-B2.

Table IV-B1: EXPORTS OF PALM AND PALM KERNEL OILS BY SELECTED COUNTRIES AND REGIONS

Product/country	Export ('000 tonnes)			Period 1970-79	
	1970-72 (average)	1977-79 (average)	1980 (preliminary)	Annual average increase ('000 tonnes)	(%)
PALM OIL					
Africa (10 countries)	150	90	70	-8	-5.3
of which: Ivory Coast	30	70	50	6	9.6
Zaire	80	10	10	-10	-31.7
Asia and Pacific (5 countries)	760	2,100	2,810	149	13.1
of which: Malaysia	550	1,610	2,300	111	13.4
Indonesia	200	390	480	27	9.8
World	910	2,240	2,890	146	11.0
PALM KERNEL OIL /a					
Africa (17 countries)	260	160	180	-13	-6.2
of which: Nigeria	130	90	110	-4	-3.7
Asia and Pacific (2 countries)	50	160	240	17	20.8
of which: Malaysia	30	140	210	18	39.5
Indonesia	20	20	20	-1	-2.8
World	320	330	420	3	1.0

/a Including oil equivalent of palm kernel exports.

Source: Food and Agriculture Organization, 1980.

Table IV-5. PALM OIL EXPORTS BY MAJOR EXPORTING COUNTRIES, FIVE-YEAR AVERAGES AND PERCENTAGE SHARES, 1960-79.

Country	1960-64 '000 Mt.	1960-64 Percent	1965-69 '000 Mt.	1965-69 Percent	1970-74 '000 Mt.	1970-74 Percent	1975-79 '000 Mt.	1975-79 Percent	1979 '000 Mt.
WESTERN AFRICA	191.67	31.30	105.45	14.96	86.02	5.18	105.41	4.95	65.2
Nigeria	147.64	24.11	65.23	9.25	5.96	0.44	7.66	0.36	0.0
Ghana	0.06	0.00	0.30	0.04	-	-	0.02	0.00	0.0
Liberia	-	-	-	-	0.23	0.01	1.38	0.06	2.5
Sierra Leone	-	-	-	-	-	-	-	-	-
Dahomy (Benin)	11.61	1.90	10.86	1.54	11.65	0.86	3.22	0.15	3.0
Ivory Coast	0.80	0.14	0.92	0.13	48.90	3.62	81.80	3.84	49.5
Togo	0.43	0.07	0.09	1.09	0.08	0.08	0.00	0.00	
Cameroon	8.26	1.34	8.42	1.19	7.15	0.54	7.96	0.37	7.0
Central Afr. Rep.	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Congo Peop. Rep.	3.31	0.54	0.66	0.09	-	-	0.00	0.00	0.0
Eq. Guinea	2.91	0.47	5.03	0.42	3.00	0.22	3.22	0.15	3.2
Gambia	-	-	-	-	-	-	-	-	-
Guinea	-	-	-	-	-	-	-	-	-
Guinea-Bissau	0.07	0.01	0.08	0.01	0.08	0.00	0.07	0.00	0.0
Sao Tome/Principe	0.95	0.15	0.54	0.07	0.19	0.01	0.00	0.00	0.0
Angola	15.45	2.52	13.44	1.90	7.35	0.54	0.92	0.04	0.0
EASTERN AFRICA	148.87	24.31	114.24	16.21	89.98	6.67	22.40	1.05	0.0
Tanzania	0.08	0.01	0.05	0.00	0.01	0.00	0.00	0.00	0.0
Burundi	-	-	-	-	-	-	-	-	-
Zaire	148.79	24.30	114.19	16.20	89.97	6.67	22.40	1.05	0.0
LATIN AMERICA	2.28	0.37	3.67	0.52	5.22	0.18	2.68	0.13	2.1
Brazil	-	-	-	-	-	-	-	-	-
Colombia	-	-	-	-	-	-	-	-	-
Costa Rica	0.39	0.06	0.17	0.02	0.19	0.01	0.06	0.00	0.0
Ecuador	-	-	-	-	-	-	-	-	-
Honduras	0.14	0.02	0.83	0.11	0.49	0.03	0.00	0.00	0.0
Mexico	-	-	-	-	-	-	-	-	-
Paraguay	1.75	0.28	2.67	0.37	4.54	0.33	2.62	0.13	2.1
Venezuela	-	-	-	-	-	-	-	-	-
EAST AFRICA-PACIFFIC	222.31	36.31	385.44	54.69	903.67	67.05	1,663.90	78.10	1,706.8
China Rep.	-	-	-	-	-	-	0.00	0.00	0.0
Indonesia	113.88	18.60	153.56	21.78	229.70	17.04	391.90	18.40	350.8
Malaysia	108.43	17.71	231.38	32.90	673.97	50.00	1,271.98	59.70	1,356.0
Philippines	-	-	-	-	-	-	0.04	0.00	0.0
EMENA	0.09	0.01	-	-	0.67	0.04	0.09	0.01	0.1
Bahrain	-	-	-	-	0.00	0.00	0.00	0.00	0.0
Lebanon	-	-	-	-	0.00	0.00	0.00	0.00	0.0
Portugal	-	-	-	-	0.67	0.04	0.09	0.01	0.1
Spain	0.09	0.01	-	-	-	-	0.00	0.00	0.0
Syrian Arab Rep.	-	-	-	-	-	-	-	-	-
OTHERS	47.01	7.67	95.93	13.61	262.15	19.45	335.25	15.74	507.5
Austria	-	-	-	-	-	-	-	-	-
Belgium-Luxembourg	7.73	1.26	4.96	0.70	2.72	0.20	7.04	0.33	9.4
Czechoslovakia	-	-	-	-	-	-	-	-	-
Denmark	0.07	0.01	1.58	0.22	0.10	0.00	2.82	0.13	5.0
France	1.65	0.26	0.65	0.09	1.47	0.10	1.06	0.05	1.0
Germany, FR	3.12	0.50	3.54	0.50	7.24	0.53	18.50	0.90	15.1
Hong Kong	-	-	-	-	-	-	0.11	0.01	0.1
India	-	-	-	-	0.00	0.00	0.00	0.00	0.0
Italy	0.10	0.01	0.14	0.01	0.61	0.04	0.42	0.02	1.0
Japan	0.18	0.02	0.11	0.01	0.43	0.03	0.38	0.02	0.2
Mali	-	-	-	-	-	-	-	-	-
Netherlands	5.45	0.89	10.00	1.41	47.40	3.51	63.46	2.98	56.7
Nicaragua	0.24	0.03	-	-	-	-	0.00	0.00	0.0
Norway	-	-	-	-	-	-	-	-	-
Papua-New Guinea	-	-	-	-	4.33	0.32	26.18	1.23	29.4
Singapore	27.02	4.41	74.15	10.52	196.43	14.57	212.54	9.98	383.3
Sweden	0.28	0.04	0.16	0.02	0.54	0.04	1.28	0.07	1.8
Uganda	0.37	0.06	0.33	0.04	0.05	0.00	0.00	0.00	0.0
United Kingdom	0.80	0.13	0.30	0.04	0.33	0.06	1.70	0.08	1.2
Suriname	-	-	-	-	-	-	-	-	2.5
WORLD TOTAL	612.23	100.00	704.73	100.00	1,347.72	100.00	2,129.73	100.00	2,281.7

Source: FAO, Trade Yearbook.

Table IV-B3: AVERAGE GROWTH RATES OF WORLD EXPORTS FOR THIRTEEN OILS AND FATS

Oils and fats	Growth rate per year (%) 1960-1969	1970-1979
Palm	1.97	13.16
Palm Kernel	-2.94	0.59
Soybean	6.19	9.07
Sunflowerseed	20.65	5.18
Cottonseed	-4.30	1.92
Groundnut	2.58	-0.48
Rapeseed	22.40	6.74
Olive	2.33	2.72
Coconut	-0.76	1.98
Lard	0.036	1.39
Tallow	6.13	2.38
Butter	1.65	2.98
Fish	12.89	0.96

Source: PORIM, "A Statistical Analysis of the World Export and Price Relationships of the Major Oils and Fats with Special Reference to Palm Oil," Malaysia, 1980.

Table IV-B4: MALAYSIA EXPORT OF CRUDE AND PROCESSED PALM OIL BY COUNTRY OF DESTINATION
(Tonnes)

Destination	1970			1975			1979		
	Crude	Processed	Total	Crude	Processed	Total	Crude	Processed	Total
USA	19,938	-	19,938	262,624	75,107	337,731	7,840	102,752	110,592
U.K.	74,923	-	74,923	162,565	626	163,191	126,409	35,893	162,302
Netherlands	32,965	-	32,965	163,637	1,303	164,940	89,004	79,301	168,305
Iraq	63,241	-	63,241	74,616	-	74,616	-	66,478	66,478
India	128	-	128	23,117	-	23,173	12,173	270,506	282,679
F.R. Germany	6,738	-	6,738	23,079	1,016	24,095	44,606	19,038	63,644
Canada	11,932	-	11,932	23,955	-	23,955	-	-	-
Japan	11,002	-	11,002	50,825	9,165	59,990	8,835	120,604	129,439
Italy	5,042	-	5,042	7,033	-	7,033	23,021	-	23,021
Pakistan	-	-	-	10,262	-	10,262	5,578	62,271	67,849
Singapore	143,341	-	143,341	49,059	106,619	155,678	8,552	518,280	528,832
Others	32,680	-	32,680	106,639	9,396	116,035	32,155	268,056	300,211
TOTAL	401,930	-	401,930	957,411	203,232	1,160,693	358,173	1,543,179	1,901,352

Note: Export of PPO started only from 1975.
Source: Department of Statistics, Malaysia.

Most of the industrialized country importers are engaged in the re-exports of palm oil. The leading re-exporters have been the Netherlands and Germany, FR. Since 1975 the average annual share in world export trade of the former has been 3 percent and that of the latter about 1.0 percent. 1/

From the developing world, Singapore is the major re-exporter. Its re-exports amounted to about 10 percent of total exports in each of the years between 1975 and 1979.

Imports: A fairly recent feature of the trade in palm oil is the fact that the biggest part of the growth in imports has been taken by developing countries (Table IV-B5). The share of developing importers has grown from 15% to over 40% in the last ten years. 2/ However, industrialized countries still account for some 60 percent of total world imports. The fastest and largest expansion in import demand in the developing region has been in India, Iraq and Pakistan.

Sizeable markets have also been developed in certain countries in Africa. The most likely prospect is that many more developing countries, some of them producers and exporters in the past, would soon become net importers if their domestic outputs of palm oil continue to decline while their consumptions increase. A case in point is Nigeria, a country that once dominated world export trade in palm oil but is now a net importer of vegetable oils.

The above scenario implies that as the potential for expanding consumption diminishes in industrialized countries, an increasing share of the world production of palm oil (as well as some other fats and oils) will be marketed in developing countries.

The traditional importers of palm oil in industrialized countries are likely to continue to import at about current levels (Tables IV-B5 and IV-B6). Imports into these countries have shown little increase in the last few years, with Japanese and EEC imports almost unchanged. They may also undertake some drastic adjustments of their imports in the light of the overall world fats and oils situation in a given period. For example, the United States imported 424.3 thousand tons of palm oil in 1975 because of the need for

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1/ See Table IV-B2.

2/ FAO, "Palm Oil and Palm Kernel Oil in the World Fats and Oils Economy", 1981.

TABLE IV-B5: IMPORTS OF PALM AND PALM KERNEL OILS BY SELECTED COUNTRIES AND REGIONS

Product/Country	Imports ('000 tonnes) 1974-74 (average)	1974-76 (average)	1977-79 (average)	1979	Annual Growth rate (%)
PALM OIL					
Total developing countries	150	320	840	940	21.9
Africa	30	50	90	100	21.5
of which: Kenya	10	20	50	50	32.3
Latin America	10	10	10	10	3.6
Near East	90	100	150	160	5.8
of which: Iraq	90	80	120	130	3.9
Asia and Pacific	20	160	570	630	38.6
of which: India	-	30	390	400	-
Pakistan	-	100	150	200	-
Asia: Centrally Planned	-	10	30	40	-
Total developed countries	790	1,240	1,180	1,210	5.9
of which: United States	120	330	180	140	6.5
EEC	540	650	660	690	3.1
Japan	40	130	140	140	15.9
USSR/E.Europe	10	20	80	110	24.9
World	930	1,560	2,020	2,150	9.8
PALM KERNEL OIL /a					
Total developing countries	10	20	30	30	9.8
Total developed countries	320	350	330	360	0.9
of which: United States	40	70	70	80	7.2
EEC	230	240	210	220	-0.9
Japan	10	10	10	10	0.6
USSR/E.Europe	10	-	-	-	-
World	330	370	360	390	1.4

/a Including oil equivalent of palm kernel imports.

Source: Food and Agriculture Organization.

Table IV-86: PALM OIL IMPORTS BY MAJOR IMPORTING COUNTRIES, FIVE-YEAR AVERAGES AND PERCENTAGE SHARES

Country/Region	1960-64		1965-69		1970-74		1975-79		1979
	'000 Mt.	Percent	'000 Mt.	Percent	'000 Mt.	Percent	'000 Mt.	Percent	'000 Mt.
EAST AFRICA	4.10	0.72	8.76	1.38	18.68	1.50	41.47	2.06	53.5
Kenya	1.76	0.30	5.94	0.93	13.36	1.07	36.80	1.83	47.0
Mozambique	0.00	0.00	0.50	0.07	0.88	0.07	0.76	0.04	3.3
Rhodesia (Zimbabwe)	0.36	0.06	0.30	0.04	0.50	0.04	0.00	0.00	0.0
Sudan	0.16	0.02	0.07	0.01	0.05	0.00	0.01	0.00	0.0
Tanzania	0.06	0.01	0.41	0.06	1.56	0.12	3.42	0.17	2.6
Uganda	1.76	0.30	1.43	0.22	2.29	0.18	0.38	0.02	0.6
Zambia	0.00	0.00	0.06	0.00	0.04	0.00	0.10	0.00	0.0
WEST AFRICA	3.61	0.63	6.61	1.04	8.82	0.70	19.48	0.77	19.0
Angola	0.06	0.01	0.34	0.05	0.05	0.00	4.48	0.22	1.8
Cameroon	0.15	0.02	0.78	0.12	0.04	0.00	0.02	0.00	0.0
CAR	0.19	0.03	0.93	0.14	1.56	0.12	0.13	0.01	0.1
Congo PR	0.10	0.01	0.08	0.01	0.49	0.03	0.84	0.04	1.0
Benin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Eq. Guinea	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Gabon	0.00	0.00	0.00	0.00	0.00	0.00	2.66	0.13	3.4
Gambia	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.0
Ghana	0.21	0.03	1.45	0.22	3.78	0.30	6.70	0.33	6.0
Guinea	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Ivory Coast	2.55	0.44	1.94	0.30	0.00	0.00	0.00	0.00	0.0
Liberia	0.00	0.00	0.04	0.00	0.00	0.00	0.01	0.00	0.0
Mali	0.17	0.02	0.12	0.01	0.75	0.06	0.08	0.00	0.4
Senegal	0.01	0.00	0.78	0.12	1.86	0.14	2.80	0.14	3.7
Sierra Leone	0.02	0.00	0.12	0.01	0.11	0.00	0.00	0.00	0.0
Togo	0.15	0.02	0.03	0.00	0.00	0.00	0.00	0.00	0.0
Niger	0.00	0.00	0.00	0.00	0.18	0.01	1.74	0.09	2.6
EAST ASIA AND PACIFIC	37.56	6.60	76.67	12.12	229.97	18.42	160.63	7.97	245.4
Khmer Rep.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
China Rep.	0.00	0.00	0.00	0.00	1.62	0.12	0.00	0.00	0.0
Fiji	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.0
Hong Kong	0.00	0.00	0.00	0.00	0.17	0.01	0.46	0.02	0.3
Korea Rep.	0.00	0.00	0.14	0.02	1.03	0.08	4.76	0.24	11.9
Malaysia	3.98	0.70	0.12	0.01	1.37	0.10	0.32	0.02	0.0
New Guinea	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.0
Philippines	4.99	0.87	6.99	1.10	4.32	0.34	1.40	0.07	1.0
Singapore	28.54	5.01	69.34	10.96	221.36	17.73	148.18	7.36	223.2
Thailand	0.05	0.00	0.08	0.01	0.10	0.00	5.48	0.27	9.0
Indonesia	-	-	-	-	-	-	-	-	-
SOUTH ASIA	34.13	6.00	8.39	1.32	33.70	2.70	390.76	19.40	607.3
Bangladesh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Burma	0.00	0.00	0.00	0.00	0.00	0.00	5.98	0.30	5.9
Sri Lanka	0.00	0.00	0.75	0.11	0.50	0.04	0.38	0.02	0.0
India	34.13	6.00	5.52	0.87	23.27	1.86	240.92	11.95	400.0
Pakistan	0.00	0.00	2.12	0.33	9.93	0.79	143.68	7.13	201.4
EMENA	5.64	0.99	5.63	0.88	8.85	0.70	24.26	1.20	154.1
Algeria	0.65	0.11	0.72	0.11	1.00	0.08	1.88	0.09	4.1
Bahrain	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.0
Cyprus	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.0
Iran	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.0
Israel	0.37	0.06	0.78	0.12	1.08	0.08	0.36	0.02	0.1
Jordan	0.72	0.12	1.94	0.30	3.13	0.25	1.84	0.09	2.3
Kuwait	0.06	0.01	0.03	0.00	0.00	0.00	0.00	0.00	0.0
Lebanon	0.13	0.02	0.11	0.01	0.07	0.00	0.00	0.00	0.0
Libyan AR	0.01	0.00	0.06	0.00	0.12	0.00	0.84	0.04	1.0
Malta	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.01	0.0
Morocco	0.27	0.04	0.06	0.00	0.00	0.00	1.70	0.08	3.5
Syria	3.40	0.59	1.92	0.30	3.39	0.27	8.52	0.42	11.0
Turkey	0.00	0.00	0.01	0.00	0.00	0.00	8.94	0.44	0.0
UAR	0.03	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.1
Iraq									130.0
Saudi Arabia									2.0

Table IV-B6: (continued) ... (IMPORTS)

Country/Region	1960-64 '000 Mt.	1960-64 Percent	1965-69 '000 Mt.	1965-69 Percent	1970-74 '000 Mt.	1970-74 Percent	1975-79 '000 Mt.	1975-79 Percent	1979 '000 Mt.
LAC 5.25	0.92	4.56	0.72	6.27	0.50	10.61	0.53	11.74	
Argentina	0.26	0.04	0.05	0.00	0.05	0.00	0.07	0.00	0.0
Barbados	0.00	0.00	0.02	0.00	0.06	0.00	0.00	0.00	0.0
Brazil	0.00	0.00	0.06	0.00	0.05	0.00	0.80	0.04	2.0
Chile	0.42	0.07	1.43	0.22	0.02	0.00	0.05	0.00	0.0
Colombia	1.11	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Costa Rica	1.08	0.18	1.61	0.25	0.46	0.03	0.08	0.01	0.0
Ecuador	1.51	0.26	0.94	0.14	5.39	0.43	5.38	0.27	7.4
El Salvador	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Guatamala	0.01	0.009	0.02	0.00	0.00	0.00	0.00	0.00	0.0
Guyana	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Honduras	0.29	0.05	0.00	0.00	0.06	0.00	2.22	0.11	0.0
Jamaica	0.02	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.0
Martinique	0.00	0.00	0.00	0.00	0.01	0.00	0.02	0.00	0.04
Mexico	0.17	0.02	0.19	0.03	0.16	0.01	1.96	0.10	2.3
Nicaragua	0.01	0.00	0.18	0.02	0.00	0.00	0.00	0.00	0.0
Peru	0.09	0.01	0.06	0.00	0.01	0.00	0.00	0.00	0.0
Trinidad	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Venezuela	0.27	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.0
OTHERS	478.28	84.11	521.97	82.51	941.59	75.45	1,367.11	67.87	1,342.1
Australia	2.49	0.43	2.96	0.46	10.01	0.80	20.32	1.0	26.7
Austria	1.28	0.22	0.19	0.03	3.24	0.25	6.66	0.33	6.6
Belgium Lux.	40.19	7.06	26.51	4.19	25.06	2.00	33.74	1.68	43.2
Canada	11.53	2.02	11.08	1.75	18.32	1.46	35.62	1.77	18.4
Denmark	3.84	0.67	1.58	0.24	8.56	0.68	14.68	0.73	19.0
Faeroe Is.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Finland	0.05	0.00	0.02	0.00	0.82	0.06	1.60	0.08	1.1
France	34.90	6.13	38.00	6.00	49.14	3.93	63.72	3.16	69.5
Germany FR	86.57	15.22	115.07	18.19	140.40	11.25	189.18	9.39	174.9
Iceland	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.0
Ireland	4.14	0.72	3.16	0.49	4.25	0.34	5.96	0.30	9.6
Italy	27.59	4.85	38.18	6.03	51.71	4.14	54.50	2.71	71.7
Japan	15.30	2.69	25.70	4.06	70.35	5.63	137.72	6.84	139.0
Netherlands	74.50	13.10	69.32	10.95	137.56	11.02	175.42	8.71	167.0
New Zealand	0.01	0.00	0.01	0.00	0.36	0.02	0.80	0.04	0.0
Norway	0.64	0.11	0.22	0.03	9.93	0.79	3.24	0.16	4.9
Portugal	14.29	2.51	15.48	2.44	18.85	1.51	18.80	0.93	20.0
South Africa	0.00	0.00	0.11	0.01	0.97	0.07	3.70	0.18	3.3
Spain	0.22	0.03	2.39	0.37	5.70	0.45	6.50	0.32	10.2
Sweden	2.03	0.35	2.54	0.40	7.50	0.60	17.88	0.89	20.5
Switzerland	1.55	0.27	2.59	0.40	4.93	0.39	5.96	0.30	6.2
UK	136.70	24.04	122.85	19.42	212.13	16.99	225.00	11.17	228.7
US	15.25	2.68	37.15	5.87	147.86	11.84	269.60	13.38	144.6
Yugoslavia	1.11	0.19	1.31	0.20	0.14	0.01	1.66	0.08	2.9
China	0.03	0.00	0.32	0.05	0.00	0.00	20.68	1.03	44.9
Cuba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Czechoslovakia	0.72	0.12	0.79	0.12	5.27	0.42	0.52	0.03	0.0
Hungary	1.04	0.18	0.54	0.08	0.12	0.00	0.00	0.00	0.0
Poland	1.08	0.18	1.84	0.29	8.41	0.67	14.98	0.74	10.9
USSR	1.22	0.21	2.06	0.32	0.00	0.00	38.66	1.92	98.3
WORLD TOTAL	568.57	100.00	632.59	100.00	1,247.88	100.00	2,014.32	100.00	2,433.1

Source: FAO, Trade Yearbooks

greater use (substitute) of other oils following the simultaneous production shortfalls in coconut and groundnut oils in 1973/74; but this figure had declined to 300.4 thousand tons in 1976 and 140 thousand tons in 1979. 1/

Like the United States, the average levels of imports rose significantly in Canada between 1975-79 both in absolute and relative terms compared to 1970-74 (Table IV-B6). Average Canadian import was up from 18.3 thousand tonnes in 1970-74 to 35.6 in 1975-79--an increase of 94.5 percent. In absolute terms, the largest importers of palm oil during 1975-79 continued to be France, Germany FR, the Netherlands and the United Kingdom. For the period in question, the average share of world imports was 3.2 percent for France, 9.4 percent for Germany, 8.7 percent for the Netherlands, 11.2 percent for the United Kingdom and 13.4 percent for the United States.

Palm kernel oil is almost exclusively imported by industrialized countries, the United States being the only major market showing significant growth. Imports into developing countries have increased but remain less than 10 percent of the total. Generally, palm kernel oil is in close technical and economic competition with coconut oil in world markets.

In the centrally planned economies, China and the USSR are likely to become potential markets for palm oil. Between 1975-79, China accounted, on average, for 1.0 percent of world imports and the share of USSR was about 2.0 percent. A few years earlier (1970-74), imports of palm oil by these two countries were either negligible or non-existent.

It is worth noting that refined palm oil products from developing countries (mainly from Malaysia) are now being exported in large quantities. Refined palm oil is exported to India, North America, Japan, Pakistan and the USSR. The main markets for palm olein include India, Japan and Saudi Arabia. Palm stearin's final markets appear to be largely in the EEC and, to some extent, in China (see Tables IV-B4 and IV-B5).

1/ USDA, U.S. Fats and Oils Statistics 1963-1978, Statistical Bulletin, No. 631, Table 52. (USDA quoted values in thousand pounds); and Hancock, Palm Oil and Palm Kernel Oil in the World Fats and Oils Economy, 1981.

C. Market Structure and the Trading of Palm Oil

State trading agencies and cooperative trading organizations in palm oil producing countries market their products through private companies, independent dealers or other intermediaries in the United Kingdom, the Netherlands and Germany. Although the United States is becoming an important marketing center, the three countries mentioned above constitute the major terminal markets.

The market for processed palm oil products is dominated by a few companies involved in the processing of palm oil and manufacturing of fat and oil-based products. The processors and manufacturers purchase the bulk of the crude oil needed through brokers and dealers at terminal markets. Palm oil is sold mostly on forward contract.

Many of the companies that process and obtain by-products from palm oil own distribution and retail outlets. For example, a large British-based company, Lever Brothers, manufactures products with high palm oil content (especially soap) and undertakes their distribution. Other companies exist as distributing chains for the manufacturers. A lot of processing and refining of palm oil takes place in the United Kingdom, the Netherlands, Germany and Malaysia. The processed products are absorbed mainly by Singapore, India, Iraq, Japan, the United States, the Netherlands and the United Kingdom.

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V. INTERNATIONAL PRICES AND MARKET PARAMETERS

A. Prices

Following the lead of most other fats and oils, prices for palm oil and palm kernel oil fluctuated widely during the last two decades (1960-80). These fluctuations have been partially explained in terms of simultaneous increases or declines in production and export of major fats and oils. Increased or decreased levels of fats and oils output are related to changes in the normal weather pattern (for example, typhoons affect coconut harvesting in the Philippines, droughts reduce soybean yields in US), to disease (in the case of oil palm) and to planting decisions made.

Since most fats and oils are interchangeable, end-users tend to substitute one oil for another. Consequently, prices of individual fats and oils are mostly determined through the simultaneous interaction of supplies and demand for all fats and oils in international markets. Table V-A1 gives a general picture of prices of selected fats and oils since 1960; and Table V-A2 is the correlation matrix of prices of these fats and oils.

The increased possibility of substitution of one oil for another, made practicable by technological improvements of refining of fats and oils, has encouraged the use of cheaper oils (such as palm and soybean oils) at the expense of high-priced oils (such as butter and olive oil). This has tended to depress the general price level of high-priced oils. 1/

Currently the prices of palm oil as well as those of most fats and oils are on a downward trend in West European markets. The price of palm oil declined by $100 (or 17 percent) from $600 per ton in July to $500 in August. Over the same period the prices of palm kernel oil and coconut oil went down from $617 and $586 to $570 and $565, respectively. A downward trend was also detected for soybean oil price which fell by 23% from $529 to $406 during the same period.

As the volume of coconut oil trade is about four times greater than that of palm kernel oil, palm kernel oil prices tend to follow those of coconut oil. The price series for palm kernel oil and coconut oil show that

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1/ IBRD, Price Prospects for Major Primary Commodities, Report No. 814/80.

Table V-A1: PRICES OF SELECTED FATS AND OILS C.I.F. EUROPE, 1960-1980 AND 1985
(In US dollars per metric ton)

Year	Soybean	Sunflower	Cottonseed	Groundnut	Rapeseed	Olive	Palm	Coconut	Palm Kernel	Fish	Lard	Butter	Tallow
1960	225	243	235	326	219	585	228	312	317	155	214	851	142
1961	287	311	305	331	280	561	232	254	263	139	225	706	158
1962	227	246	266	275	221	631	216	251	255	104	218	822	137
1963	223	236	243	268	215	871	222	286	287	160	216	900	141
1964	205	255	250	315	252	586	240	297	299	203	251	911	168
1965	270	294	278	324	263	663	273	348	353	217	293	910	200
1966	261	263	333	296	244	661	236	324	271	196	282	833	180
1967	216	212	378	283	206	690	224	328	249	127	205	817	144
1968	178	172	305	271	161	681	169	399	367	99	169	709	129
1969	228	213	291	332	200	666	181	361	306	150	216	709	166
1970	307	331	354	379	293	699	260	397	429	240	271	733	202
1971	323	375	392	441	295	727	261	371	335	221	262	1,048	176
1972	270	326	324	426	232	916	217	234	244	182	251	1,209	179
1973	465	480	500	546	395	1,399	378	513	491	342	373	975	356
1974	795	903	939	1,077	745	2,174	669	998	1,010	559	602	1,216	448
1975	619	739	726	857	551	2,436	434	393	439	344	479	1,669	340
1976	438	581	593	741	415	2,166	406	418	433	372	480	1,740	371
1977	576	639	622	852	584	2,234	530	578	620	472	618	2,247	421
1978	607	665	661	1,079	597	2,427	600	683	764	451	626	1,982	483
1979	662	772	798	889	621	2,701	654	985	992	450	693	2,698	612
1980	598	632	657	863	570	2,500	674	673	669	450	644	2,352	487

Descriptions

Soybean Oil: Crude, US, c.i.f. Rotterdam
Sunflower Oil: Any origin, ex-tank Rotterdam
Cottonseed Oil: US, PBST, c.i.f. Rotterdam.
Groundnut Oil: Nigerian/Gambian/Any Origin, c.i.f. Europe
Rapeseed Oil: Dutch, f.o.b. ex-mill
Olive Oil: Spanish, edible, 1% drums
Palm Oil: Malaysian, 5%, c.i.f. U.K.

Coconut Oil: Philippines/Indonesian, bulk, c.i.f. Rotterdam.
For 1973, Dutch, 5% ex-mill; prior to 1973, White Ceylon, 1%, bulk ex-tank, Rotterdam.
Palm Kernel Oil: West African, c.i.f. U.K.
Fish Oil: Any origin, crude, c.i.f. Europe. Prior to March 1973, Peruvian, semi-rolled.
Lard: EEC refining quality, c.i.f. U.K. Prior to February 1973, YS, Prime Steam, c.i.f. UK.
Butter: Dutch, bulk, unsalted, UK markets.
Tallow: US, bulk, bleachable fancy, c.i.f. Rotterdam.

Price Index weighted by current world exports (1974=100).

Source: Oil World Digest, and Public Ledger.

Table V-B1: SUMMARY SHEET FOR COMMODITY SUPPLY: PRICE AND INCOME ELASTICITIES OF PALM PRODUCTS

Country	Variables			Own Price Elasticity			Data Interval	Period /e	Quality				
	Quantity variable /a	Price variable /b	Form of variable /c	Short-run	Lag Period	Long-run /d			Method f/	Data Source	Number of data /g	R^2	Significance
Philippines	S	F	AL	.299	1	.66	A	1953-66	D	X	14	.975	X
(number of palm trees)	S	W	AL	-.0008	1	-.012	A	1953-66	S	X	14	.973	0

NOTES

/a Supply = S, Exports = X.
/b Farm level = F, Wholesale = W, Retail = R, Unit Value = U, c.i.f. = C, f.o.b = B.
/c Actuals = A, First differences = F, Logarithms = L, Prices Deflated = P.
/d Annual = A, Quarterly = Q, Monthly = M, Weekly = W, Daily = D, Cross-sectional = C.
/e Arc Computation = C, Graph = G, Guestimate = E, Ordinary Least Squares = O
Simultaneous Equation Method = S, Flexibility = F.
/f Data Source Indicated, Insert = X, Otherwise = O.
/g Significant at 95% = X, Nonsignificant at 95% = 0, Otherwise blank.

Source: UNCTAD, Survey of Commodity Demand And Supply Elasticities, 1974.

the former had been enjoying a slight premium over the latter but this premium has been slowly eroded in the last few years (Table V-A1). International price trends of palm and palm kernel oils for the period 1960-1980 are illustrated in Figure V-1.

B. Supply Elasticities

By its very nature, producers of oil-bearing trees, such as oil palm, are likely to be less responsive to price changes than producers of annual crops. Unlike annual crop producers who can adjust their production plans quickly (usually within a year) to changes in the market prospects for such crops, producers of palm oil and other oil-bearing tree crops lack this option. Their investment in oil palm is partially based on price expectations for a longer period. Once the trees have been planted, producers have no choice but to harvest even in the face of falling prices. Crops left unharvested became a major source of diseases which endanger the life of the trees and thus future harvests.

Two studies on the price elasticity of palm oil production in Malaysia and the Philippines support the expectation that the response of palm oil producers to changes in price is relatively low. The Malaysian study indicated that production of palm oil is highly inelastic both in the short- and long-run. 1/ That study provides short-term and long-term price elasticities of -0.7671 and 0.1629, respectively. The Philippine study 2/ found a short-run elasticity of 0.299 and a long-run elasticity of 0.66 (Table V-B1).

C. Demand Elasticities

A 1971 study of demand for palm oil in the Philippines came up with an income elasticity of 1.0, a long-run own price elasticity of demand of -0.302 to -0.381, and a long-run cross price elasticity of export demand of

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1/ H.S. Khera, The Oil Palm Industry of Malaysia, 1976, p. 197.

2/ A.V. Nyberg, "The Philippine Coconut Industry," Unpublished Ph.D. dissertation, Cornell University, 1968.

Figure V-1: PALM AND PALM KERNEL OIL PRICES

——— Palm Oil Price (US$/MT)

..... Palm Kernel Oil Price (US$/MT)

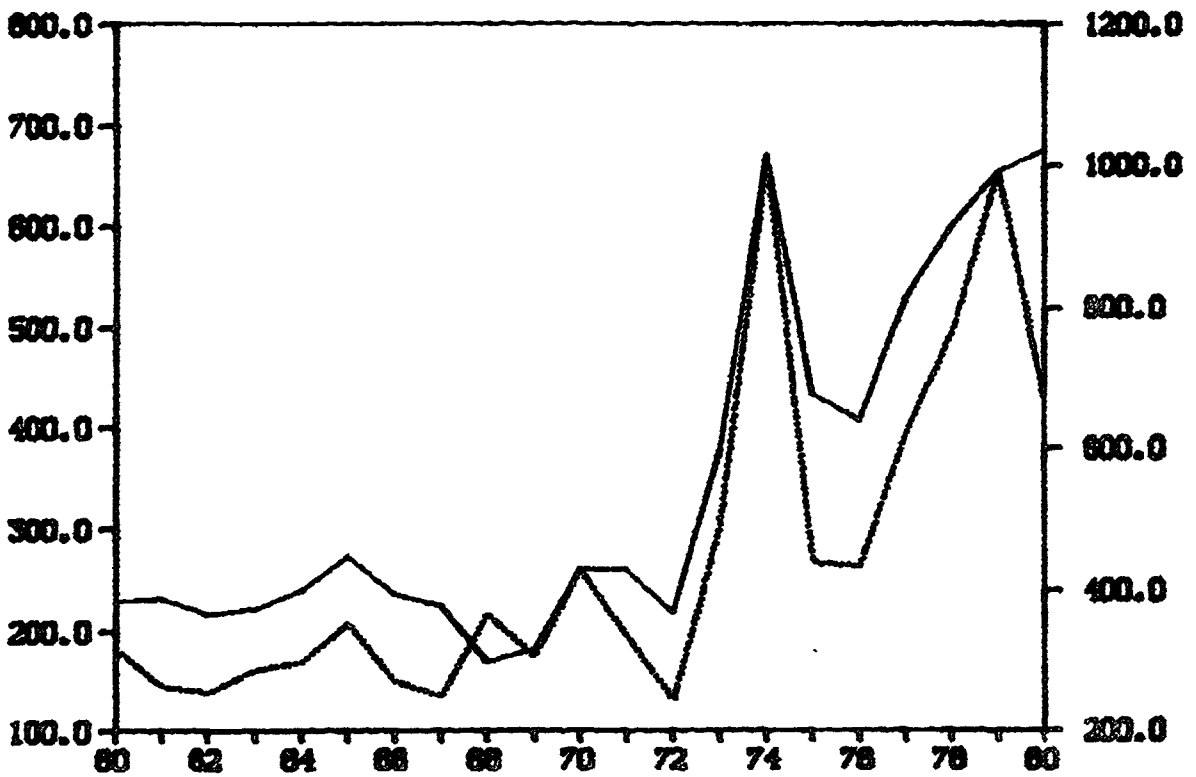

Table V-B1: SUMMARY SHEET FOR COMMODITY SUPPLY: PRICE AND INCOME ELASTICITIES OF PALM PRODUCTS

Country	Variables			Own Price Elasticity			Data Interval	Period /e	Quality				
	Quantity variable /a	Price variable /b	Form of variable /c	Short-run	Lag Period	Long-run /d			Method f/	Data Source	Number of data /g	R^2	Significance
Philippines	S	F	AL	.299	1	.66	A	1953-66	D	X	14	.975	X
(number of palm trees)	S	W	AL	-.0008	1	-.012	A	1953-66	S	X	14	.973	0

/a Supply = S, Exports = X.
/b Farm level = F, Wholesale = W, Retail = R, Unit Value = U, c.i.f. = C, f.o.b = B.
/c Actuals = A, First differences = F, Logarithms = L, Prices Deflated = P.
/d Annual = A, Quarterly = Q, Monthly = M, Weekly = W, Daily = D, Cross-sectional = C.
/e Arc Computation = C, Graph = G, Guestimate = E, Ordinary Least Squares = O
Simultaneous Equation Method = S, Flexibility = F.
/f Data Source Indicated, Insert = X, Otherwise = 0.
/g Significant at 95% = X, Nonsignificant at 95% = 0, Otherwise blank.

Source: UNCTAD, Survey of Commodity Demand And Supply Elasticities, 1974.

-0.874. 1/ The high income elasticity of demand for palm oil in the Philippines is consistent with a priori expectations that the demand for fats and oils is inversely related to income (Table V-C1).

A more recent (1981) study estimated world export demand for palm oil to be about -0.82 (when export volume is regressed on own price) and -0.49 (when palm oil prices are regressed on export volume). 2/

1/ A.E. Recto, "An Analysis of the International Demand for Philippine Coconut Products," Unpublished Ph.D. dissertation, University of Minnesota, 1971.

2/ C.S. Chow and B. Yusof, "A Statistical Analysis of the World Export and Price Relationships of the Major Oils and Fats with Special Reference to Palm Oil," August 1981.

Table V-C1: SUMMARY SHEET FOR COMMODITY DEMAND: PRICE AND INCOME ELASTICITIES OF PALM PRODUCTS

Country	Variables			Own Price Elasticity	Other Price Elasticities		Income Elasticity	Data Interval /d	Period	Quality				
	Quantity variable /a	Price variable /b	Form of variable /c	Long-run	Variables	Elasticity Value				Method /e	Data Source /f	Number of Data	R^2	Significance /g
Philippines (Palm oil)	D	W	AP	From -.302 to -.381			1.0	A	1950-67	S & TS		18		
" (except demand)	M	W	AP	From -.874 to -1.278	Cottonseed oil	From .814 to 1.278	From 2.3 to 2.5	A	1950-67	S & TS		18		
					Palm kernel oil	From .780 to .997								
" (Lauric Oils) US	D	W	LP	-.241			.522	A	1953-66	TS	X	14		X
" US	D	W	LA	-.238			.596	A	1953-66	TS	X	14		X
" Europe	D	W	LP	-.786			.144	A	1953-66	TS	X	14		X
" "	D	W	LA	-.570			.614	A	1953-66	TS	X	14		X
" US (per capita)	D	W	LA	-.220			.368	A	1953-66	TS	X	14		X
" Europe (per capita)	D	W	LA	-.579			.197	A	1953-66	TS	X	14		X
Philippines (Copra)	D	W	LA	-.093			.583	A	1953-66	S	X	14	.50	0

/a Demand = D, Imports M.
/b Form level = F. Wholesale = W, Retail = R, Unit Value = U, c.i.f. = C, f.o.b. = B.
/c Actuals = A, First differences = F, Logarithms = L, Prices Deflated = P.
/d Annual = A, Quarterly = Q, Monthly = M, Weekly = W, Daily = D, Cross-sectional = C.
/e Arc Computation = C, Graph = G, Guestimate = E, Ordinary Least Squares = O, Simultaneous Equation Methods = S, Flexibility = F.
/f Data Source Indicated, Insert = X, Otherwise = O.
/g Significant at 95% = X, Nonsignificant at 95% = 0, Otherwise blank.

Source: UNCTAD, Survey of Commodity Demand and Supply Elasticities, 1974.

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VI. SPECIAL ISSUES

A. Barriers to Trade and Protection

One major obstacle to increased international trade is the existence of trade barriers and restrictions. These restrictions have taken various forms such as quotas, special preference schemes, tariffs, variable levies, "voluntary" export restraint, etc. Protection for technical reasons is partly through standards concerning product quality, packaging and labeling. A case in point is the fact that for a while, refined palm oil products from developing countries were not considered to meet the quality requirements of industrialized regions. However, that is now changing as refined palm oil products from producing countries are being supplied to several industrialized and developing markets.

Table VI-1 shows existing duties, preferential rates and tariffs that affect trade in oil palm products (as well as in other major fats and oils) in Canada, Japan, United States and in the EEC. The main preferential schemes and the duty rates shown on the table are with respect to M.F.N., G.S.P. and ACP. 1/ In order to enhance proper comparison of the duty and tariff structures we will turn briefly to GSP and ACP.

Generalized System of Preferences (GSP)

The principles and objectives of preferences in favor of developing countries were formally accepted in Conference Resolution 21 (II) of the Second Session of the United Nations Conference on Trade and Development held in New Delhi in 1968. The objectives of the generalized non-reciprocal, non-discriminatory system of preferences were to increase export earnings, promote industrialization and to accelerate rates of economic growth of developing

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1/ M.F.N.= Most favored nation status; G.S.P. = Generalized System of Preferences, and ACP refers to the preferential treatment granted by the EEC to 60 countries in Africa, the Caribbean and the Pacific (ACP).

Table VI-1: SELECTED PREFERENCE-GIVING COUNTRIES OR GROUP OF COUNTRIES: IMPORT DUTIES AND PREFERENTIAL RATES FOR SELECTED OILSEEDS, VEGETABLE OILS AND OILCAKES

		CANADA		EEC /a			JAPAN		UNITED STATES	
		M.F.N. rates	G.S.N. rates	M.F.N. rates	G.S.P. rates	ACP rates	M.F.N. rates	G.S.P. rates	M.F.N. rates	G.S.P. rates
		ad valorem					ad valorem or or Yen/kg /b		ad valorem or U.S. cents/lb.	
Copra		free	/c	free	/c		free	/c	¢1.87	/c
Coconut oil	crude	10	free	5-10	2.5-7		(10% /d	/c	¢0.20 /e	free
	refined	17.5	12.5	8-15	6.5-13	free	(or Y10			
Copra cake		free	/c	free	/c		Free	/c	¢0.3	/c
Groundnuts		free	/c	free	/c		free	/c	¢7	/c
Grountnut oil	crude	10 /f	free	5-10	/c					
	refined	17.5 /b	12.5	8-15	/c	free	Y17-23 /h	/c	¢4	/c
Groundnut cake		free	/c	free	/c		free	/c	¢0.3	/c
Palm kernels		free	/c	free	/c		free	/c	free	/c
Palm kernel oil	crude	10	free	5-10	2.5-7		8%	/c	free /i	free
	refined	17.5	12.5	8-15	6.5-13	free				
Palm kernel cake		free	/c	free	/c		free	/c	¢0.3	/c
Palm kernels		free	/c	free	/c		free	/c	free	/c
Palm kernel oil	crude	10	free	5-10	2.5-7					
	refined	17.5	12.5	8-15	6.5-13	free	8%	/c	free /i	free
Palm kernel cake		free	/c	free	/c		free	/c	¢0.3	/c
Palm oil	crude	10	free	4-6	2.5-4		8% /j	4%	free /k	/c
	refined	17.5	12.5	8-14	8 /c -12)	free				
Soybeans		free	/c	free	/c		free	/c	¢1	/c
Soybean oil	crude	10 /f	/c	5-10	2.5-10 /b		free	/c		
	refined	17.5 /g	/c	8-15	/c	free	Y17-23 /h	/c	22.5%	/c
Soybean meal		free	/c	free	/c		free	/c	¢0.3	/c

/a When ranges are shown, the lower end gives the tariff for oils for technical or industrial uses other than the manufacture of foodstuffs, and the higher end of the range gives the tariff for oils for other uses. The tariffs shown do not include that (20% M.F.N. and 18% GSP) charged on oils in solid state, for uses other than industrial, in packings of 1 kg. or less.
/b Whenever alternative (ad valorem or specific) duties are shown, the highest applies.
/c Not included in GSP schemes and, therefore, the M.F.N. rate applies to GSP beneficiaries.
/d To be reduced to 9% by 1 January 1987 as a result of the Tokyo Round of MTNs.
/e To be reduced to zero on 1 January 1981 as a result of the Tokyo Round of MTNs.
/f To be reduced to 7.5% by 1 January 1987 as a result of Tokyo Round of MTNs.
/g To be reduced to 15% by 1 January 1987 as a result of Tokyo Round MTNs.
/h Temporary duties. General duties are higher. For soybean oil, duties to be bound at Y17-20.7/kg. as a result of Tokyo Round of MTNs. The lower rate applies to oils with more than 0.6 acid value, the higher rate to other oils.
/i De facto rate. The bound rate for inedible oils is ¢3/lb.
/j To be reduced to 7% as a result of the Tokyo Round of MTNs.
/k De facto rate. The bound rate for oil for uses other than the metallurgic industry is ¢3/lb. to be reduced to ¢0.5/lb. as a result of the Tokyo Round of MTNs.

Source: FAO, "Review of the Main Preferential Schemes in the Oilseeds, Oils and Oilmeals Sector," CCP: 81/3, January 1981.

countries. 1/ The GSP are considered not binding and preference-giving countries have the right to change or amend the schemes at any time.

The Second Lome' Convention and ACP

The convention known as Lome' II was signed on October 31, 1979 between the EEC and a number of African, Caribbean and Pacific countries (ACP). The Convention, which is broadly similar to Lome'I, extends the contractual, non-reciprocal, preferential system (established under Lome' 1) in favor of ACP countries.

From Table VI-1 it is seen that as regards fats and oils, customs free entry is granted to most of ACP countries' products falling under the Brussels CCC Nomenclature Nos.15, 04 (fats and oils of fish and marine mammal, whether or not refined), 15.07 (fixed vegetable oils, fluid or solid, crude, refined or purified), 15.12 (animal or vegetable oils and fats, wholly or partly hydrogenated, or solidified or hardened by any other process, whether or not refined but not further processed).

In varying degrees, many countries with GSP schemes allow certain tropical vegetable oils exported by developing countries to enjoy some degree of tariff preferences. For example, oil palm products enter the US duty-free whereas in Canada only palm oil is duty free but refined palm oil faces a sizeable tariff. In Japan oil palm products are not included in GSP, therefore, the M.F.N. rate applies to GSP beneficiaries.

Since under the Lome' Convention imports of oilseeds, oils and related products into the EEC from ACP countries enjoy duty-free treatment, and therefore higher possible margins of preference compared to GSP (although GSP rates equal to zero are widely found) and considering the fact that on the average, tariffs of major countries with GSP and of the EEC on processed/refined palm oil are similar, it seems clear that more can be done in terms of reducing trade barriers and extending of existing preferences to a wider range of countries.

1/ FAO, "Review of the Main Preferential Schemes in the Oilseeds, Oils and Oilmeals Sector," CCP of 81/3, January 1981.

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