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THE EDIBLE OIL AND FAT SECTOR IN HAITI

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REPORT SUMMARY

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SUMMARY STATEMENT

This report was prepared for USAID/Haiti as part of the PL 480 Title III Project Paper. An overview of the current situation describes the production, consumption, importation, processing, marketing, and prices of oilseeds and edible oils and fats occurring in Haiti at present. Since the data available in this sector are lacking in both quantity and quality, the needs for additional data are presented and discussed. An assessment of the future situation concerning production, consumption, and imports of oilseeds and edible oils is presented, along with an evaluation of future processing and marketing needs. Based on these future potentials, a number of policy options are proposed for use in guiding the decisions to be made concerning production, imports, and prices of oilseeds and edible oils and fats in Haiti.

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THE EDIBLE OIL AND FAT SECTOR IN HAITI

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for the

AGENCY FOR INTERNATIONAL DEVELOPMENT
UNITED STATES DEPARTMENT OF STATE

AID/DSAN-CA-0256
Improvement of Postharvest Grain Systems

at the

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PREFACE

This report on oilseeds and edible oils and fats has been prepared for USAID/Haiti as part of the PL 480 Title III Project Paper. The scope of work as attached in Appendix A has formed the basis of the study.

The report includes other aspects important to the overall situation, so as to allow the study team to present a perspective of the policy implications involved in the oilseed and edible oil sector.

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EXECUTIVE SUMMARY

The executive summary sets forth three important areas for consideration in the oilseed and edible oil and fat sector. These areas are data needs, future potentials, and policy actions. The study team believes these to be cogent points for necessary decisions and actions in the sector under study.

Data Needs

Extensive deficiencies exist in the data available on the oilseed and edible oil and fat sector. The important point is to realize the weaknesses in the system and to address these needs through a long-term development process.

The evident needs for improvement in the data system concerning oilseeds and edible oils and fats can be ranked as follows:

1. Reconciliation of import data.
2. Household budget studies, which entail not only consumption data, but also prices for all food and non-food items consumed in the household.
3. Production surveys to update past work and better refine data on area cultivated and yields of oilseed crops.
4. Price surveys, which ascertain data on prices for oils, processed vegetable and fat products, and oilseeds. These price surveys should include processor, wholesale, and retail prices.
5. Market studies to define marketing channels, volume flows, and handling procedures.

These data requirements are necessary for the full understanding of the oilseed and edible oil sector. Without a sound set of data to assess past performance of the market system and evaluate the current situation, neither development projects nor changes in policy direction can be expected to achieve any measure of success.

Future Potentials

Future potentials for the oilseed and edible oil and fat sector in Haiti revolve around (1) the potential for domestic oilseed production, (2) future market sizes and consumption needs, (3) the possibilities for nutritional improvement, and (4) price expectations.

The potential for any significant increase in future oilseed production is very limited. The major constraints are available land, yields, production costs, and cultural practices. The only major oilseed that has any potential is peanuts. Peanut production can play an important role in the area of food production, but because of constraints it can not be considered for oil extraction. The feasibility of increasing oilseed pr[illegible] seeds to SODEXOL is considered to be non-existent, both technically and economically, because of the constraints involved. If peanuts remain at their calculated percentage of total direct oilseed consumption, peanut production must increase to a level of 70,300 MT per year by 1990-91.

The ability of the Haitian consumer to increase per capita consumption of oils and fats has resulted from an increasing per capita income whose annual growth rate was superior to the annual growth rate in the price of oils and fats. The average annual growth rate for per capita consumption over the past decade was 9.5 percent. Future consumption is expected to increase at the same percentage rate until 1985-86 and then increase at a lesser percentage rate.

The market size for lard and lard substitutes (beurre de cuisine, margarine, and shortening) can not be calculated because of data insufficiencies. The market size for liquid edible oils is calculated to be 29,500 MT for 1983-84. This market size is projected to increase to 35,000 MT and 45,000 MT for 1985-86 and 1990-91, respectively.

To meet the needs of the market, some combination of soybeans, crude soybean oil, and semi-refined vegetable oil will have to be imported, since domestic production of oilseeds to meet the edible oil market demand is not feasible. The current capacity of the private sector refiners is more than adequate to handle increased market requirements. However, even if SODEXOL operates at capacity, additional crude or semi-refined vegetable oil will have to be imported.

While growing market sizes meet the need for increased per capita consumption of oil which will bring per capita caloric intake to near recommended levels, there is still the need to increase per capita intake of protein. This can be accomplished in part by an increase in the per capita consumption of oilseeds. The consumption of peanuts in the form of oilseeds rather than in the form of processed oil provides for a greater protein intake while still providing the calories and fatty acids essential to the diet. Protein intake can also be increased through the use of soy flour and soy flour derivatives. Since SODEXOL has the capacity to produce soy flour for incorporation into wheat flour, this activity should be encouraged. Additional research should be conducted on increasing the use of high-protein soy flour derivatives in traditional food preparations.

The past workings of the free market system have generated intense price competition in liquid vegetable oil, which is an undifferentiated product sold in bulk. Competition also exists in processed vegetable oil and animal fat products which compete among brands and quality as well as against liquid oils. The results of this competition have led to a significant relationship between retail prices and world prices of edible oils.

This free market system has served the consumer well in terms of price and quality. However, the system has been distorted by the introduction of SODEXOL. Because of SODEXOL's high costs and monopolistic powers, refiners' margins have

been reduced to unprofitable levels, and consumer prices are no longer related to world prices. Consumer prices will not be affected by whether SODEXOL imports soybeans or edible oil, or whether private refiners are allowed to import small quantities of oil (PL 480 or import licenses). Therefore, retail prices will remain at artificially high levels due to the market distortion, and the study team expects this price to soon reach a higher plateau.

Policy Actions

The study team has set forth a series of policy options which are intended to be used as guidance tools. It should be recognized that further analyses will be required in order to determine the trade-offs involved in the implementation of a set of policy actions. The areas covered by these policy options are oilseed production, edible oil production, edible oil imports, and edible oil prices.

In the area of oilseed production, three options exist. These are (1) maintain the status quo, (2) develop domestic oilseed production for processing into edible oils, and (3) develop oilseed production for direct consumption as a food product. Only the last alternative is considered to be technically and economically viable.

There are basically no policy options for the production of edible oils. Since the source of oilseeds and oil will not change, and since sufficient refining capacity already exists, the current system will continue to operate.

The two policy options for the importation of edible oils into Haiti both concern imports under the PL 480 program. These two policies are (1) supply PL 480 imports of degummed crude vegetable oil to SODEXOL, and (2) supply PL 480 imports of semi-refined vegetable oil directly to private refiners. There is no economic or marketing solution for choosing between these two options. The policy approach will have to be a political decision.

There are five options available concerning price policy. These are (1) maintain the current situation, (2) remove the refiner price ceiling while still requiring refiners to purchase all oil from SODEXOL, and let the market find its equilibrium price, (3) retain the refiner price ceiling and allow refiners to purchase semi-refined oil either from SODEXOL or directly through imports, (4) admit that SODEXOL was an ill-conceived project, close the facility, and return to past market patterns, and (5) reduce import duties on edible oils. The only economically viable options appear to be the last two options, however these will require that difficult political decisions be made.

In the edible oil processing sector there are no easy policy solutions to the current situation. Given the GOH's involvement, it may not be feasible to find a policy solution which will rectify the market distortion that is causing prices to be higher than expected. The study team well recognizes USAID's concerns as to how to direct future imports of PL 480 vegetable oils. The true economic and market solutions to the current edible oil situation in Haiti will require difficult political decisions on the part of the GOH. These may not be easily forthcoming.

SECTION I

Current Situation

As part of the average diet of most populations, there is some level of consumption of vegetable oils and animal fats. Not only do these products provide necessary calories, they also form the basis for meeting the body's requirements of essential fatty acids.

Vegetable oils are divided into two major categories: (1) edible oils and (2) inedible oils, both of which are extracted from annual and perennial crops. Inedible oils, such as castor and linseed, are destined for industrial use and are processed into such products as lubricants, medicines, cosmetics, and paints. These oils can not be used for human consumption due to their chemical composition.

Animal fats are classified into three major categories: (1) lard, (2) edible tallows, and (3) inedible tallows.[1] While lard and edible tallows are used for human consumption, inedible tallows are used for industrial purposes such as soap manufacturing and animal feed processing.

Since this study deals with the need for oils and fats in the diet of the Haitian population, inedible oils and fats will not be considered.

Production of Oilseeds

Haiti produces four major oilseed crops: peanuts, sesame, cottonseed, and coconut. However, these oilseed crops are minor in importance in terms of total food production, and only peanuts and cottonseed rank in the ten major crops produced.[2]

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[1]Edible and inedible tallows are classified as a set of quality grades. This does not imply, as with vegetable oils, that inedible tallows can not be consumed because of chemical composition.

[2]Corn, millet, rice, beans, peanuts, bananas, potatoes, coffee, sugar cane, and cotton.

Of the total land area utilized for crop production, oilseeds account for no more than 6 percent. Of the land area utilized for production of the ten major crops, peanuts and cottonseed account for less than 5.5 percent.[1]

Using the highest production data,[2] annual production growth rates for peanuts, cottonseed, and sesame are 33.1, 6.6, and 7.7 percent, respectively. These production trends are illustrated in Figure 1. In reality, however, these growth rates and trends overstate the situation. Because of the small land area allocated to production of oilseeds and the resulting low level of production, no significant increase in production is generated over the time period analyzed.[3]

Another aspect of oilseed production which must be considered is the level of yields. Average yields for peanuts are only 25 percent of average yields in the U.S. While SODEXOL (Société d'Exploitation d'Oléagineux) has indicated that it has achieved yields in the range of 2,500 to 3,000 kg of peanuts per ha in selected plots, its overall average appears to be near the average of 720 kg/ha stated in current oilseed production data for Haiti.[4] Yields for cottonseed are slightly less than one-third of average U.S. yields (which are not the highest in the world). Sesame yields are equivalent to yields in certain parts of Asia where no modern system for cultivation has been introduced. These yields could be improved fourfold by adopting the use of inputs and sound production practices.

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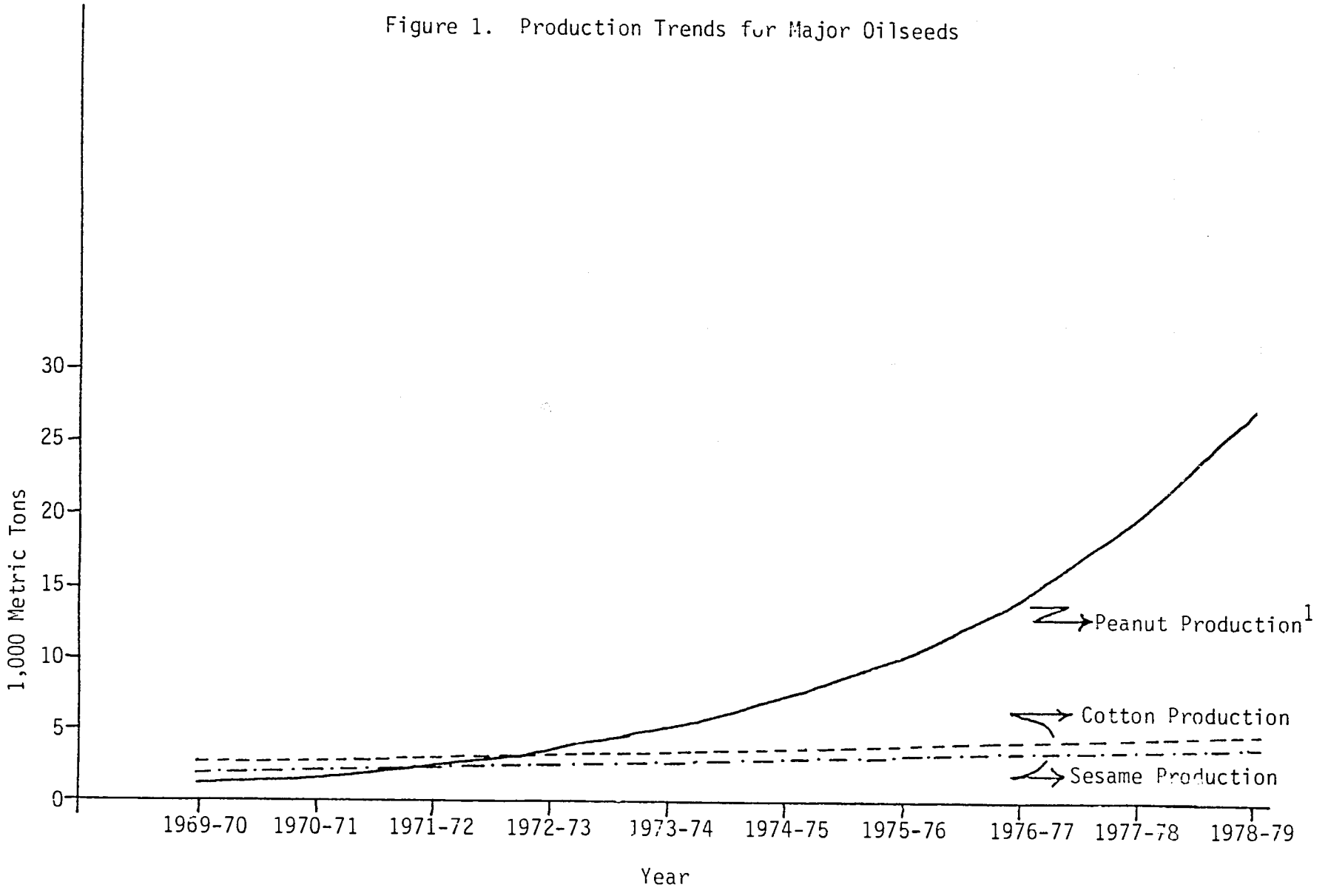
[1]Tables 2, 3, and 4, Appendix B.

[2]Tables 2 and 3, Appendix B.

[3]One must remember that with peanuts and cottonseed, total production is not consumable. With peanuts, after removing the shells only 65 percent of the tonnage is left for consumption. With cotton, the seed comprises approximately 70 percent of the tonnage, with the lint accounting for the remainder. Of this 70 percent, only approximately 20 percent (oil) is available for human consumption.

[4]Table 3, Appendix B.

Figure 1. Production Trends for Major Oilseeds



[1]The trend for peanut production is suspect because the data base available is deficient.

Another important factor in yield levels is the cultural practice under which oilseeds are grown. Two types of cultural practices exist: (1) mixed culture, in which different crops are grown intermingled on a given land area, and (2) monoculture, in which only one crop is grown on a given land area. Mixed culture accounts for 92 percent of peanuts, 82 percent of sesame, and 61 percent of cotton grown. The yields shown in Table 4, Appendix B, reveal that monoculture practices improve yields for peanuts, sesame, and cotton by 50 percent, 26 percent, and 42 percent, respectively.[1]

In summary, oilseed production in Haiti has been quite low due to restrictions in land area and yield. Because of the small quantities produced, oilseed crops such as peanuts, sesame, and coconut have been consumed directly rather than being processed into oil. Some cottonseed oil has been produced, but this has not been for the express purpose of oil production. Rather, cottonseed oil is a by-product of the processing of cottonseed into animal feed. This oil can be refined and utilized for human consumption. However, the unsophisticated nature of past extraction processes has undoubtedly led to a large amount of the cottonseed oil being consumed in the animal feed.

Production of Animal Fats

At present there is no industry based on the domestic production of animal fats in Haiti. This is primarily due to three factors which characterize the Haitian agricultural situation.

First, there is a very small number of animals being produced. The high intensity of land use for food and cash crops prevents intensive livestock production. The trend in the number of animals that produce tallow (sheep, goats, cattle) has remained relatively stable over the last 20 years. The

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[1]Monoculture usually implies the use of inputs and improved management practices.

same had been true for pigs until the recent decimation of the swine population due to African Swine Fever.

Second, livestock form only one element of the multi-cropping system utilized by the Haitian farmer. As a result, animals are complementary rather than competitive to the human population in terms of the usage of such products as cereal grains and oilseeds.

Third, because of this relation to cultural practices, the animals that are being raised are lean and slow-growing. Therefore they have a low ratio of fat to muscle under these conditions, as compared to systems of intensive livestock production which result in a higher proportion of fat to muscle.

In summary, domestically-produced animal fats are consumed as part of the meat intake rather than as a separate product. They can not be considered as a major contribution to the necessary oils and fats in the Haitian diet.

Consumption Patterns

The annual consumption of oils and fats for 1980-81 in Haiti[1] is given in the following table. The study team's calculations for per capita consumption closely match published figures.

Published total consumption		PER CAPITA CONSUMPTION Published	Calculated
Oilseeds	33,700 MT	6.6 kg	6.8 kg
Oils and fats	31,900 MT	6.6 kg	6.4 kg
		13.2 kg	13.2 kg

The effective consumption of all foods is estimated to provide a daily per capita caloric intake of 1,901 calories,[2] which includes 37 calories from

[1]UPAN, based on an average of dietary surveys 1968-80.

[2]UPAN states that daily intake is 1,901 calories, USAID gives the figure as 2,040 calories. Thus, depending on the source used, average caloric intake is between 86 and 93 percent of the daily requirement of 2,200 recommended by FAO/WHO.

oilseeds, 155 calories from oils and fats, and the balance from other foods. This would indicate that only 1.9 percent of caloric intake is provided by oilseeds and 8.2 percent by oils and fats. This amounts to a total of only 10.1 percent of caloric intake from all oils and fats.[1]

Of the total per capita consumption of 6.6 kg of oilseeds, it is calculated that peanuts comprise 4.5 kg, sesame makes up 0.9 kg, and the rest is presumably coconut. The direct consumption of peanuts can be in the form of nuts, peanut butter, or confectionary products. The largest consumption is in the form of peanut butter.

An analysis of the total oil and fat intake[2] reveals that of the 6.6 kg per capita consumption, 1.0 to 1.6 kg is most likely comprised of animal fats, and 5.0 to 5.6 kg of vegetable oils.

Based on import data for oils, fats, and processed products containing oils and fats, the following consumption trend was developed.

Trend of per capita consumption of oils and fats
(kg/yr)

1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81
2.6	2.9	3.2	3.5	3.8	4.2	4.7	5.1	5.6	6.2	6.6

This consumption trend is illustrated in Figure 2.

The average annual growth rate for per capita consumption is 9.5 percent. This matches the growth projections set forth by UPAN, which will be discussed in more detail in Section III.

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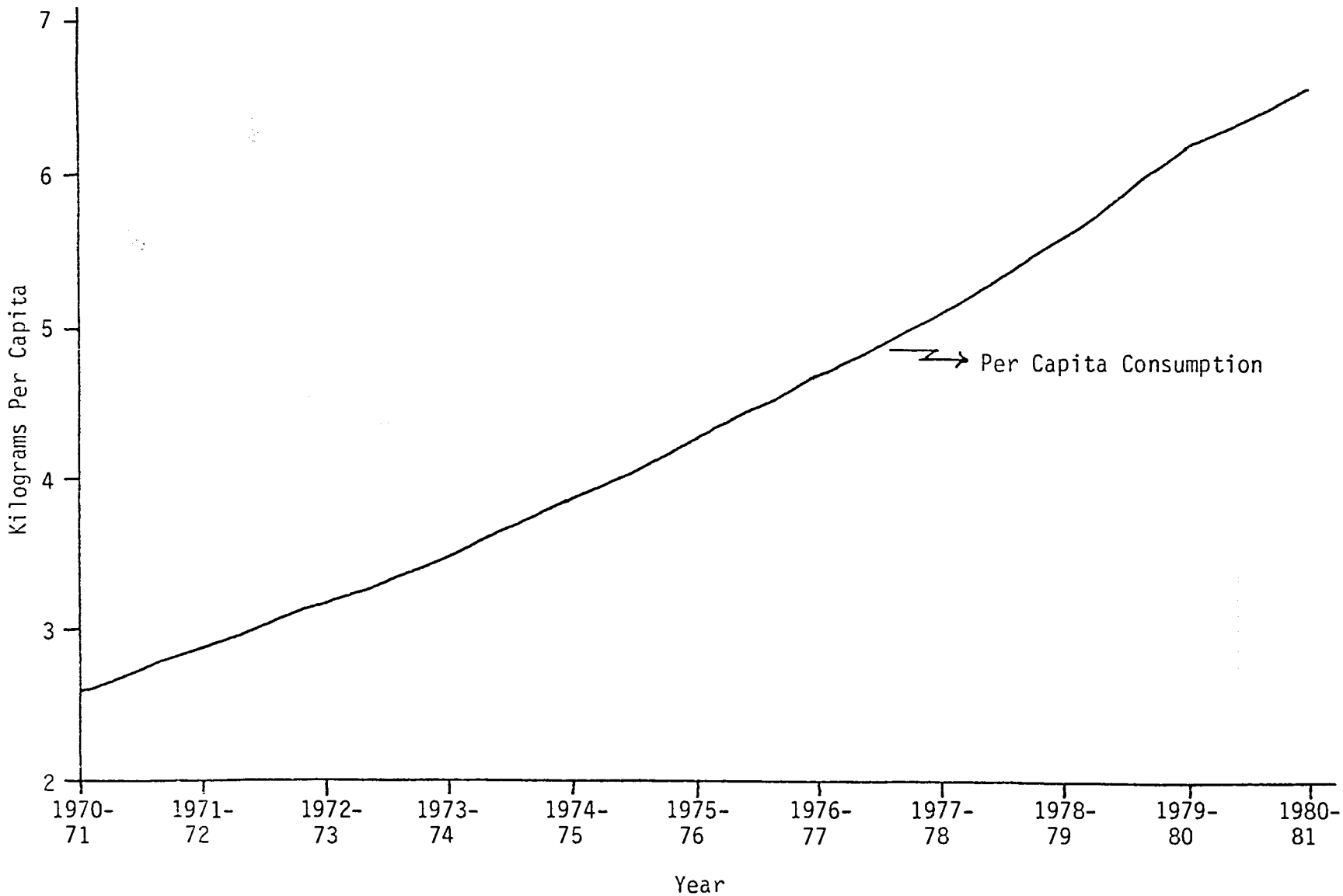
[1]USAID estimates per capita cereal consumption at 144 kg/yr. The total estimated consumption of oilseeds, oils, and fats is only 9.2 percent of cereal consumption.

[2]Using 8 calories per gram of vegetable oil and 10-12 calories per gram of animal fat.

Figure 2. Per Capita Consumption Trend for Oils and Fats



The ability of Haitian consumers to increase their per capita consumption of edible oils has resulted from an increasing per capita income whose annual growth rate was superior to the growth rate of the price of vegetable oil. The average retail price of vegetable oil increased 9.1 percent annually in current prices between 1976 and 1982. However, in constant 1976 prices, the annual change in the retail price of vegetable oil amounts to a decrease of 0.1 percent. In terms of real purchasing power there was no increase in the price of edible vegetable oils.

Per capita income increased at an annual rate of 10.3 percent between 1976 and 1982, however when deflated for inflation, the real growth in per capita income became 1.1 percent annually. This real income growth, coupled with the stability in real prices, allowed the Haitian consumers to increase their consumption of edible oils. These figures are shown in Table 1.

The same holds true for the consumption of fats. The ratio of retail oil prices to retail lard prices, as shown in Table 2, indicates a near equality in the marketplace for these products.

These consumption data imply that oils and fats are not particularly significant at this time in terms of caloric intake in the Haitian diet, but that they are significant in terms of providing the minimum essential fatty acids required in the diet, and that they are important in cooking practices.

Imports

All oils and fats used for producing refined vegetable oils, hydrogenated vegetable oil products, and other processed products from vegetable oils or fats are imported into Haiti. It is estimated that only 100 MT per year of locally-produced cottonseed oil is processed in the edible oil and fat processing industry in Haiti.[1]

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[1]UPAN.

Table 1

Price and Income Comparisons for Vegetable Oils

Year	Average Retail Price (₵ per l) Current	Average Retail Price (₵ per l) Constant (1976)	Average Retail Price (₵ per kg) Current	Average Retail Price (₵ per kg) Constant (1976)	Per Capita Oil and Fat Consumption (kg/yr)	Per Capita GNI (₵) Current	Percent of Average Income Spent on Vegetable Oil	Per Capita GNI (₵) Constant (1976)	Percent of Constant Income Spent on Vegetable Oil
1976	4.65	4.65	5.42	5.42	4.2	934	2.1	934	2.1
1977	5.07	4.72	5.91	5.50	4.7	975	2.4	908	2.4
1978	5.86	5.62	6.83	6.55	5.1	989	3.0	948	3.0
1979	5.98	5.23	6.97	6.10	5.6	1,140	2.9	997	2.9
1980	7.08	5.24	8.26	6.11	6.2	1,392	3.1	1,031	3.1
1981	7.06	4.51	8.23	5.26	6.6	1,524	3.0	973	3.0
1982	8.18	4.84	9.53	5.64	7.3	1,662	3.6	960	3.6
Annual Growth Rate (%)	9.1	-0.1	9.1	-0.1		10.3		1.1	

Source: Appendix E
Appendix F

Table 2

Price Comparisons for Oils and Lard

Year	Average Retail Price Vegetable Oil (¢ per kg)	Average Retail Price Lard (¢ per kg)	Ratio of Vegetable Oil Price to Lard Price[1]
1976	5.42	6.61	0.82
1977	5.91	6.61	0.89
1978	6.83	6.61	1.03
1979	6.97	6.61	1.05
1980	8.26	8.82	0.94
1981	8.23	9.62	0.86
1982	9.53	9.28	1.03

[1]Including lard substitutes.

Source: Appendix E
Appendix F

Based on a great number of conflicting time series given in Appendix C, the study team calculates that the following amounts of vegetable oil (semi-refined and crude) have been imported into Haiti.

Year	Vegetable oil (1,000 MT)
1970-71	10.0
1971-72	12.5
1972-73	8.1
1973-74	9.0
1974-75	11.6
1975-76	17.3
1976-77	18.9
1977-78	18.9
1978-79	18.0
1979-80	20.9
1980-81	23.2
1981-82	8.1
1982-83	13.6

The major reason for the decline of imports of vegetable oil in 1981-82 and 1982-83 is the introduction of SODEXOL, which began its operations in the latter part of 1981. SODEXOL and its operations will be discussed in the subsection on processing.

On the average, soybean oil has made up nearly 97 percent of total edible vegetable oil imports. The balance has been composed of olive oil, cottonseed oil, palm oil, and other vegetable oils.

Almost all of the soybean oil has been imported from the United States. Concessional sales (PL 480) have amounted to slightly less than 25 percent of total soybean oil imports.

With the introduction of SODEXOL in 1981, Haiti began importing soybeans to be used for oil extraction. The imports of soybeans totaled 81,500 MT in 1981-82 and 78,500 MT in 1982-83. This is equivalent to importing 14,700 MT and 14,100 MT of soybean oil in 1981-82 and 1982-83, respectively.

A clear understanding of the import situation for fats and tallows is complicated by the fact that data on imports of edible and inedible tallows

and lard are combined into a single category, and available data do not allow the determination of what portion of imports went into food processing, and what portion went for the manufacture of soaps.

The general trends for imports of oils and fats in Haiti are shown in Figure 3.

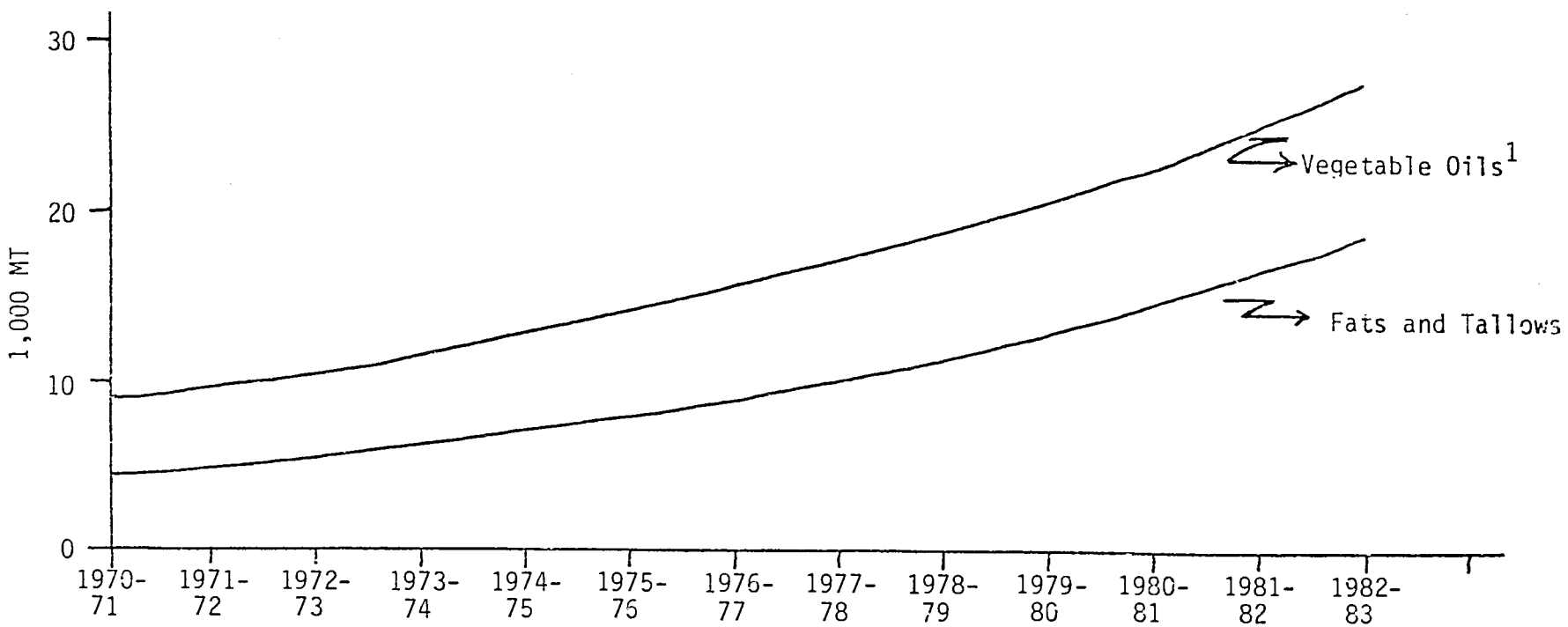
Processing Sector

The processing sector for edible oils and fats in Haiti encompasses the entire range of activities from extraction to refining of the oil product. The initial process of extraction is the removal of oil from the oilseeds by means of a chemical process. The resulting oil is called crude oil. Degummed crude is crude oil from an extraction plant which has had the gums removed from it. Semi-refined oil is crude oil which has been degummed and neutralized. The neutralization process removes free fatty acids and other impurities from the oil. The total refining process entails degumming, neutralization, bleaching (a process which gives the oil a uniform color), deodorization (the removal of unpleasant or unnatural odors), and winterization (a process which increases the shelf life of the oil).

The processing sector for edible oils and fats in Haiti is comprised of seven private-sector refiners who handle vegetable oils as well as tallows, and one additional private-sector refiner who processes only lard. With the exception of the refinery which deals only with lard, the other seven refineries produce a mixture of products, both edible and inedible. These products include liquid vegetable oils, solid or hydrogenated products such as lard substitutes, and industrial products such as soaps.

In the past, these seven refiners acquired all their raw materials in the form of semi-refined vegetable oils which were imported into Haiti (with the exception of the 100 MT of locally-grown cottonseed oil refined per year). This situation changed in 1981 with the introduction of SODEXOL.

Figure 3. Import Trends for Oils and Fats



[1]1981-82 and 1982-83 include oil equivalent in imported soybeans.

SODEXOL is a standard extraction and refining plant with the necessary equipment to perform the entire process from oilseed extraction to final refining. SODEXOL is equipped to process a number of oilseed crops including peanuts, sunflower, cottonseed, and soybeans. SODEXOL was established for the purpose of producing semi-refined oil which would then be sold to private-sector refiners. SODEXOL is a quasi-public organization owned by the Government of Haiti; private-sector Haitian investors, les Investissements Industriels S.A. (LINSA); and a private-sector foreign firm, Universal Seeds and Oil Products (USOP). The original investment gave each of these parties one-third ownership of the company, but recent transactions have given the Government of Haiti a majority share.

Because SODEXOL was designed to produce sufficient oil to satisfy consumer demand, it was given monopoly powers by the Government of Haiti in the area of edible oils. Thus third parties were forbidden to import oilseeds, refined edible oils, semi-refined edible oils, crude edible oils, and their by-products. In spite of this restriction, import licenses have on several occasions been granted to other firms for the importation of soybean oil.[1] Although the reason given for granting these import licenses was that SODEXOL was not supplying enough oil to meet consumer demand, this has been denied by SODEXOL.

In addition to supplying semi-refined oil to private refiners, SODEXOL also produces considerable quantities of soybean meal, since this is a natural by-product of soybean oil extraction. SODEXOL also has equipment to produce a high-protein soybean flour for human consumption, although this product is not currently being manufactured.

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[1] 200 MT in October 1981, 6,000 MT in July 1982, and 5,000 MT in November 1983.

The processing volumes for the total edible oil and fat sector, as given in Appendix D, more or less track the growth patterns for imports over the same period, depending on which time series are used for comparisons.

The study team inspected the quality of refined oil packaged in barrels at various wholesale outlets. The quality appears to be high in terms of taste, purity, odor, and color. The barrels were properly capped when filled, and from the appearance of the oil being pumped out, the barrels are kept clean.

Marketing System

Estimates for the total market for oils and fats have ranged from 18,000 to 24,000 to 30,000 MT annually. SODEXOL considers the current total market for vegetable oils to be 24,000 MT per year. It is readily apparent that no one actually knows what the effective market demand[1] or the potential market demand is for these products.

Based on available data for imports and processing volumes, the study team has calculated that the upper limits of effective market demand for oils and fats may have been as high as 31,000 MT and 36,000 MT for 1982 and 1983, respectively. These quantities would encompass vegetable oils, fats, and processed products containing oils and fats.

Taking the projected consumption trend as set forth in the subsection on consumption, and subtracting the expected tonnage of fats consumed as part of the meat and fish intake and the amount of fat consumed through imported processed products, the resulting figures match the figures for soybean oil imports. Thus the consumption trend accurately reflects per capita consumption based on imports.

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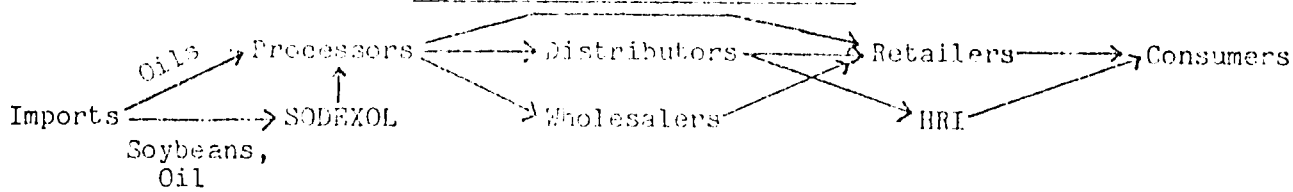
[1]Effective market demand is the total quantity that will be purchased in the marketplace based on product price and the consumer's ability to purchase.

By establishing a ratio of fats to oils calculated on the basis of consumption data, one can say that the market size for vegetable oil was 23,000 MT in 1981-82 and 27,000 MT in 1982-83. One can expect at this time that the market size for 1983-84 for vegetable oil can be estimated at 29,500 MT. SODEXOL's current monthly sales of soybean oil verify the validity of this estimate.

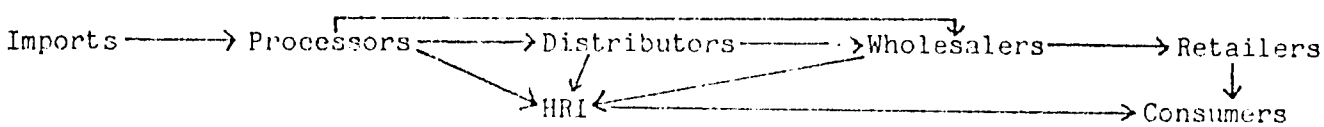
The market for fats can not be accurately assessed because available data do not differentiate between the edible and inedible sectors.

The marketing system for oils and fats is best described in the form of a flow diagram for the vegetable oil products and animal fat products being sold in the system. These flow diagrams are as follows:

Vegetable oils and products



Animal fat products



The marketing system appears to be multi-faceted. Processors are not involved in operating wholesale operations. In many cases, the wholesaler may act as a distributor, depending on the geographical market or product market being served. The wholesaler may also act as a retailer in some instances.

Processors package the refined vegetable oil in 56-gallon drums for most of their sales (98-99 percent of the market). The drums move through the marketing channels to wholesalers and oil is sold out of the drums to retailers or consumers who supply their own containers. The unit of sale from wholesaler to retailer is generally one gallon, although quantities as small as one-half liter can be purchased. Consumer purchases from retailers may be as small as one gloss (one-tenth of a liter).

A very small percentage of the market is supplied by oil packaged in plastic containers of one gallon and one-half gallon. Other vegetable oil products such as beurre de cuisine, margarine, and shortening are packaged in containers ranging in size from one-gallon cans to 37-pound tins. As with oil, these containers are opened in the retail market and the products are sold to consumers in small quantities.

Animal fat products are packaged in tins ranging from 33 to 35 pounds in weight, and they generally follow the same breakdown procedure.

What may appear on the surface to be a disorganized marketing system is in reality a rational free-enterprise market at work. There is intense competition at all levels within the different marketing channels, as well as between the vegetable oil and animal fat sectors. This intense competition centers mainly around price for an undifferentiated commodity such as vegetable oil which is sold in bulk. However, there is quality and brand competition as well as price competition when considering vegetable oil and fat processed products such as lard, shortening, beurre de cuisine, and margarine.

Prices and Margins of Edible Oils

The average retail prices of edible oils over the past six and one-half years are depicted in Figure 4.[1] The increasing trend in edible oil prices in Haiti is a reflection of such factors as inflation and overall increases in

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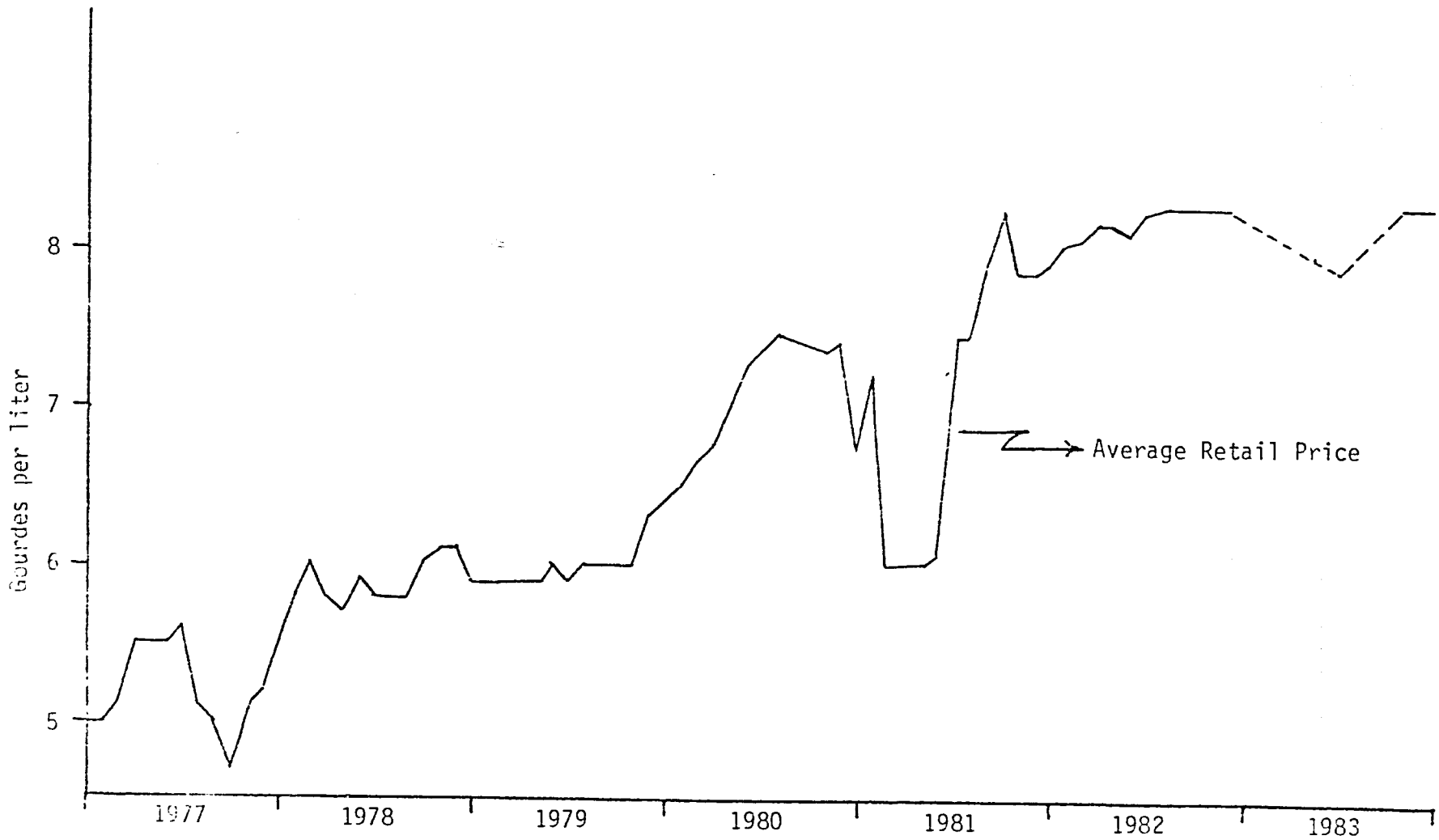
[1]The data for the last six months of this time series are somewhat questionable. The average price data series in Table 2 of Appendix F shows a dramatic decrease in retail prices, beginning in January 1983. The study team has extreme doubts about the reliability of these numbers, since in December 1983 oil is being sold in the marketplace at a price ranging from G 7.50 to G 7.57 per liter at the wholesale level. Through limited retail price gathering, the study team has interpolated a new set of average prices which are believed to more accurately reflect conditions in the first six months of 1983. It would stand to reason that if the 6,000 MT of oil allowed into the country through import licenses in July 1982 were introduced into the marketplace according to the past six-month time lag, an average retail price decline could have occurred, but for retail prices to have fallen by nearly 30 percent goes beyond credibility.

Figure 4. Average Retail Price of Edible Oils



world prices of edible oil. However, a linear or exponential trend does not accurately reflect average retail price movements in the marketplace. The price movements for edible oils which actually occurred over the past six and one-half years can be characterized as a step process, in which there is a substantial increase in price at a certain moment, followed by a leveling out of the prices at this level for a period of time. Prices will remain at this plateau until some factor in the marketplace (such as a change in world prices, extreme inflation, or a disruption in the marketing system) causes prices to increase substantially to a new plateau. This process is illustrated in Figure 5, by using the average prices of the different plateaus to reflect the step process.[1]

The movements of retail price from month to month across the complete time series and the movement of prices around the trend at each plateau reflect the changes in world price of soybean oil up until the end of 1981. The introduction of SODEXOL into the edible oil system in Haiti subsequently changed this relationship of price movements. Average retail price is compared to world price in Figure 6.[2]

An analysis of average retail prices in Haiti compared to the world price basing point reveals that the average retail prices are significantly correlated to world prices up to the end of 1981.[3] Based on a series of analyses, Haitian average retail price movements lagged world prices by six to eight months. This would be as expected since the time required for importation of

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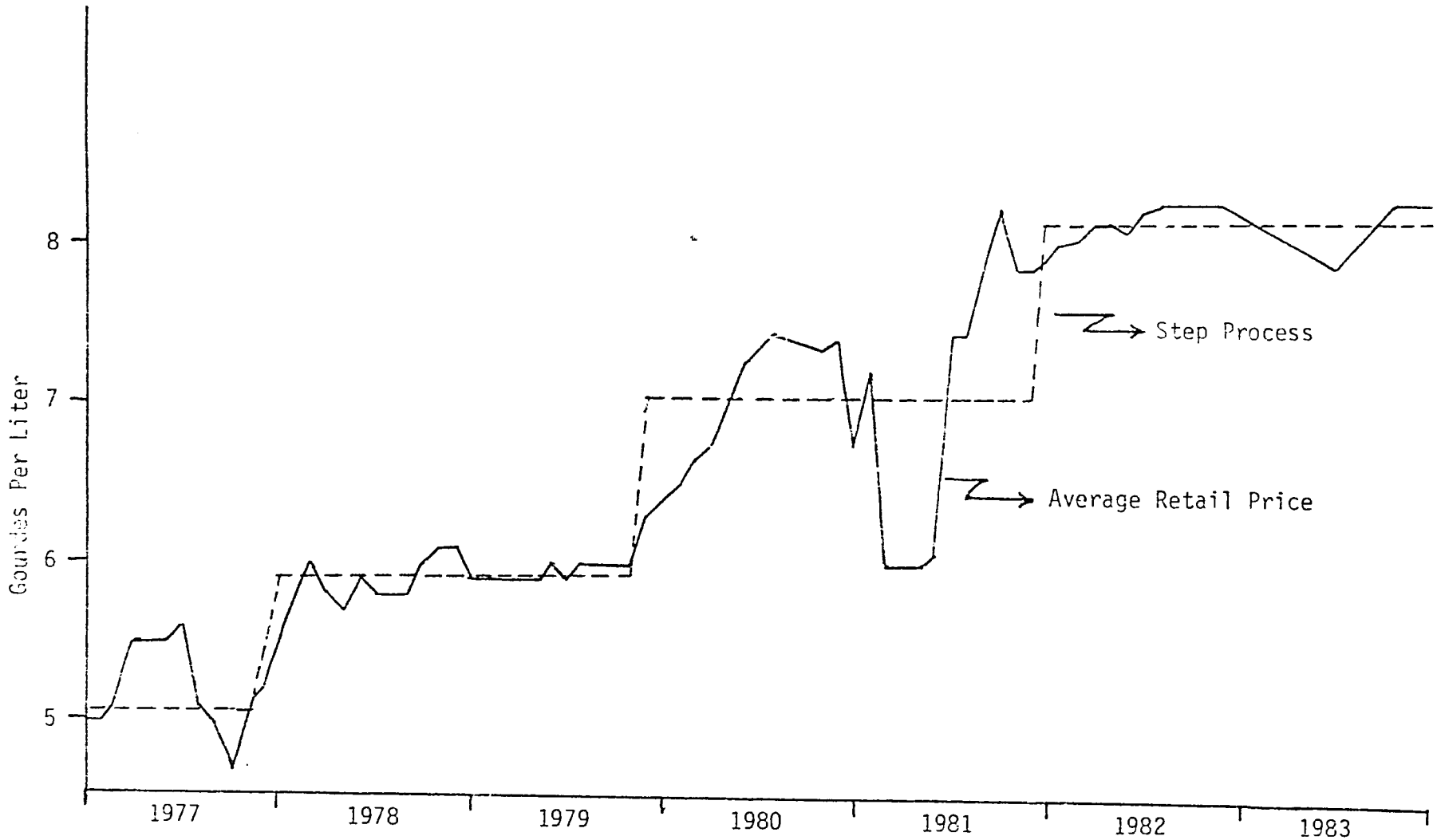
[1]A regression analysis of the step process reinforces this scenario since the trends at different price plateaus are extremely flat and do not indicate any strong directions of price movements.

[2]The world price used in this figure is based on crude soybean oil, Dutch ex-mill pricing point.

[3]The results of both individual data point and clustered data point analysis (using the price plateaus) give correlation values that are sufficiently high to explain more than 77 percent of the average retail price movements.

Figure 5. Step Process of Average Retail Price of Edible Oils



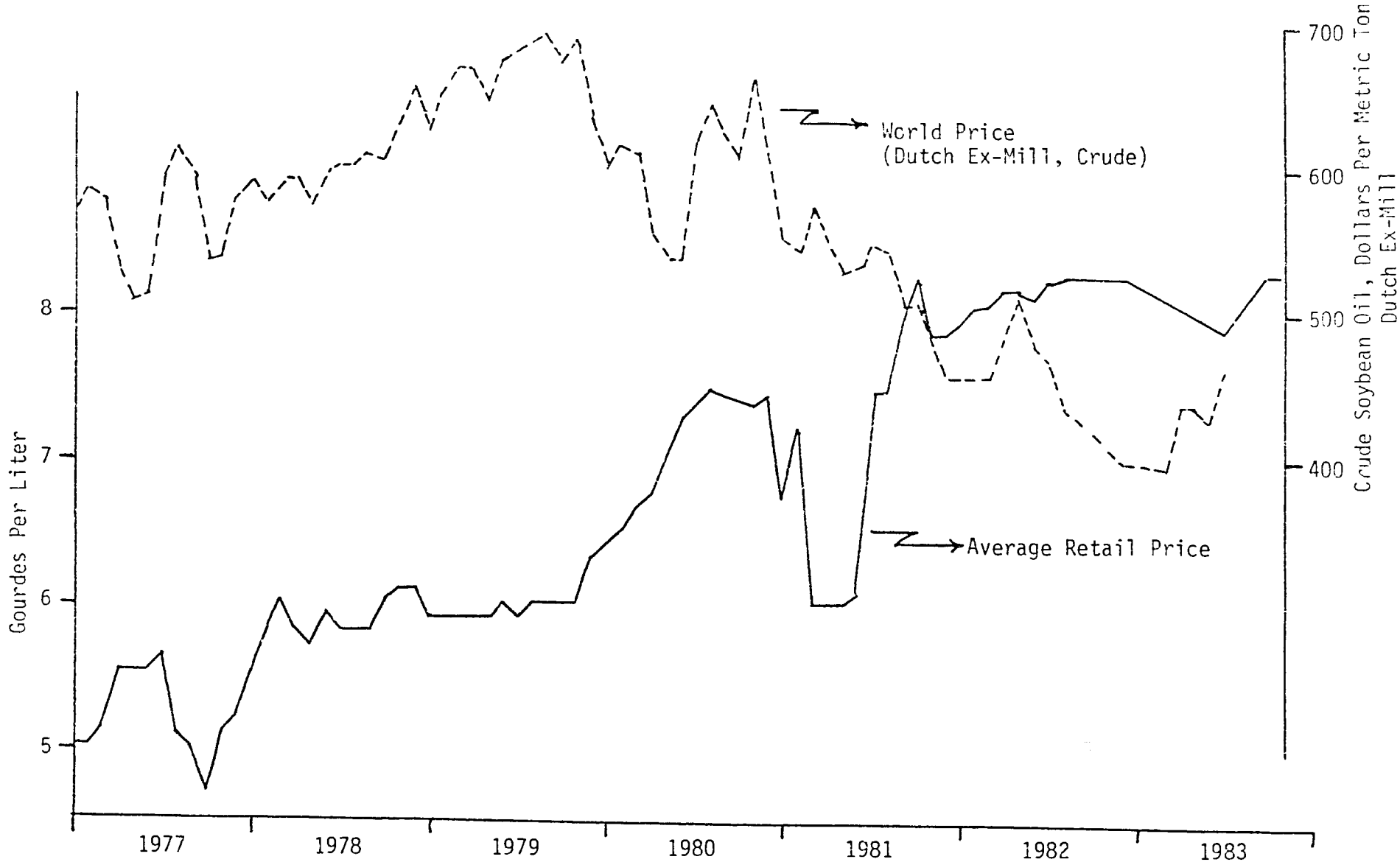


Figure 6. Average Retail Prices vs. World Prices

the crude oil, refining, and distribution of the finished product should lie somewhere within this time parameter.

With the entrance of SODEXOL into the edible oil marketing system in late 1981, the relationship between average retail prices in Haiti and world soybean oil prices ceased to show any significant correlation. The movement of all imported edible oils (both crude and semi-refined) through SODEXOL, and the extraction of edible oil from imported soybeans at SODEXOL's facility, with the resulting semi-refined oil to be sold at a fixed price of $950/MT, is reflected in the stabilization of retail prices at the last plateau. The average retail prices have not followed downward world price movements, as had occurred in the past. Figure 7 illustrates how this pricing action seems to hold average retail prices at this plateau. The intense competition among processors, wholesalers, and retailers has seemingly caused extreme price fluctuations around this plateau. This intense competition, SODEXOL's entrance into the system, and the apparent decline in margins (forced by the SODEXOL fixed price of semi-refined oil and the government fixed price of refined oil at the processor level) have combined to create price instability in the retail marketplace.

In view of the edible oil price relationships just discussed, the next areas of concern are the margins and costs involved in the marketing system of edible oil. As was the case with price relationships, these margins and costs deal exclusively with edible oil in liquid form. Solid (hydrogenated) products are not included in the analysis.

The first area of concern is the margin realized at the wholesale and retail levels. The following table illustrates the margins involved.[1]

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[1]This table is constructed using the best available data.

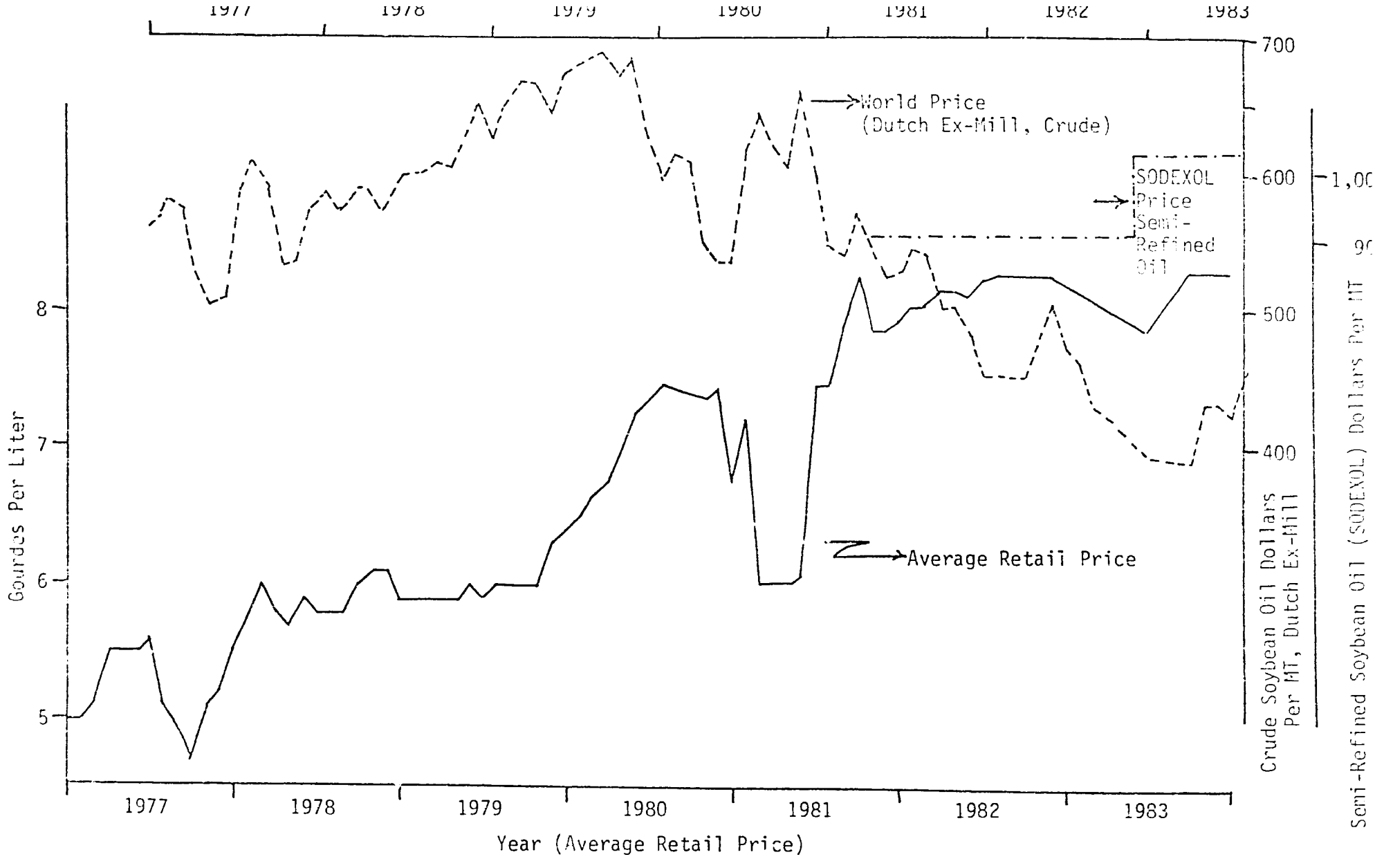

Figure 7. Soybean Oil: Average Retail Price, World Price Lagged Six Months, and SODEXOL Price

Year	Average retail price ($/liter)	Average retail price ($/barrel)	Maximum cost to wholesaler ($/barrel)	Margin ($)	Margin as percent of average retail price per barrel
1981	1.41	300.05	224.58	75.47	25.2
1982	1.64	348.99	224.00	124.99	35.8
1983[1]	1.62	344.74	237.77	106.97	31.0 } 24.8
	(1.35)	(287.28)	(237.77)	(49.51)	(17.2) }

In an edible oil marketing system such as the one that exists in Haiti, the expected margin between processor and customer price should be approximately 25 percent of the average retail price converted to the unit used by the processor (in this case, barrels). This margin should be divided into approximately 8-10 percent for the wholesaler and 15-17 percent for the retailer. This margin is necessary so as to cover the seller's operating expenses and compensate him for the time and management involved in the selling process. The necessity of this size of margin is further borne out in the work done by Roe.[2]

The figures in the above table indicate that the calculated margins as a percentage of retail value are close to those expected, with the exception of 1982.[3] This would seem to illustrate the competitive nature of the edible oil market at the wholesale and retail levels. This also indicates that at these market levels there are no excessive margins and therefore the prices to the consumers are not overly inflated.

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[1]Given the questionability of the average retail price data for the first six months of 1983, two sets of average prices have been structured. The first is the study team's calculation of yearly average price, and the prices in parentheses are based on the data supplied in Table 2, Appendix F, plus additional data collected on current prices (December 1983).

[2]Roe, Terry L., An Economic Evaluation of the Haitian Agricultural Marketing System, USAID, February 1975.

[3]Which may simply be an aberration in the numbers, considering the quality of the data involved.

The second area of concern is the margin between the cost of semi-refined oil (either imported or produced locally at SODEXOL) and the price the processor receives for refined oil. The calculated margins are described in the following table.

Year	Maximum price refined oil[1] ($/barrel)	Maximum price refined oil[2] ($/MT)	Cost of semi-refined ($/MT)	Margin ($/MT)	Direct costs and refining losses[3] ($/MT)	Remaining margin[4] ($/MT)
1981	224.58	1,227.55	671.35[5]	556.20	139.04	417.16
1982	224.00	1,224.38	950.00[6]	274.38	159.04[7]	115.34
1983	237.77	1,299.65	950.00[6]	349.65	159.04	190.61
1984[8]	293.00	1,601.54	1,295.00[6]	306.54	210.84	95.70

The important column in this table is the one which indicates the margin remaining to the processor after deducting processing losses and direct costs. This margin goes towards covering the indirect costs (overhead).[9] Any amount still remaining after paying the indirect costs is profit (return on investment, management, and risk). As a general rule, indirect costs are calculated to be

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[1]Average maximum price received by the processor per barrel of refined oil, as given in Tables 3 and 9, Appendix F.

[2]Average maximum price received by the processor per MT of refined oil. There are 5.466 barrels of oil in a MT.

[3]Calculated at the processing level. Direct costs are those costs directly attributable to the refining of oil, and do not include indirect (or overhead) costs.

[4]The remaining margin must cover indirect (overhead) costs and sales discounts.

[5]Cost of semi-refined imported oil, Appendix C.

[6]Cost of semi-refined oil from SODEXOL.

[7]Includes inflation in direct costs for 1982 only. Unable to be computed for 1983 and 1984.

[8]Projected, based on current maximum processor price.

[9]Indirect costs are sales expenses, depreciation, administrative costs, and financial costs (interest and arbitrage charges).

three times the amount of direct costs.[1] If indirect costs are calculated at this rate, then 1981 was the only year in which the margin was sufficient to provide a profit for the edible oil refiners. After 1981, the margins available to cover indirect costs are not large enough to provide any profit. Even the profit remaining in 1981 amounts to only a 6.6 percent return on sales which, considering the size of the market and the number of processors, can not be deemed excessive by any means. As a consequence of SODEXOL's entrance into the edible oil marketing system in late 1981, the refiners' margins have been narrowed to a level at which only part of their indirect costs are covered.

Although SODEXOL'S appearance on the scene has led to a reduction in the margins earned by the private refiners, this does not mean that the transfer of margins has resulted in a profit for SODEXOL. The margin required for SODEXOL to cover all its costs in 1981-82 was $124.70 per MT of soybeans processed. If this is translated into its equivalent in semi-refined oil, the necessary margin amounts to $712.57 per MT of oil produced. SODEXOL operated at a loss in 1981-82, therefore the margins transferred from the private refiners to SODEXOL disappeared in the cost of operations, as shown in Tables 11, 12, and 13 of Appendix F.

The calculated margin required for SODEXOL to cover all its costs in 1982-83, as shown in Table 11 of Appendix F, is $107.91 per MT of soybeans processed if the annual processing volume is 80,000 MT of soybeans. With an annual processing volume of 105,500 MT of soybeans, the required margin is $85.71 per MT of soybeans processed.

This facility, like any other such facility, operates with high fixed costs. In this particular case, because the facility is out of market position,

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[1]The exact ratio of indirect costs to direct costs in this case can not be determined.

the fixed costs are higher than normal.[1] For every MT of soybeans processed above and beyond the level of 80,000 MT, costs are reduced by approximately one-tenth of one cent per ton.[2]

The implication of this cost structure has an important bearing on the importation of soybean oil by SODEXOL. One MT of crude soybean oil represents the quantity of oil obtained from 5.405 MT of soybeans. If imported oil is substituted for imported soybeans, this does not reduce costs, because the extraction facility exists and is incurring costs whether or not it is being used to its fullest capacity. Therefore, the margin per MT of imported oil must be equivalent to the necessary margin on the tonnage of soybeans that the oil is replacing. As shown in Table 14 of Appendix F, the required margin for SODEXOL on crude soybean oil is nearly $400 per MT. Imported semi-refined soybean oil has the same implication for margin required by SODEXOL, except that it is slightly higher.

Given the current price for SODEXOL's semi-refined oil, if SODEXOL imports crude oil, the cost structure will be as follows:

SODEXOL semi-refined oil	$1,295/MT
Required margin	400/MT
Cost of oil without import duties	$ 895/MT
Import duties	222/MT
CIF price to maintain margins	$ 673/MT

Taking the recent price of crude soybean oil, CBOT pricing point, of 26.0 cents per pound for December 7, this equates to approximately $672 per MT CIF Port-au-Prince. SODEXOL can not better itself in any way by importing crude

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[1]As shown by Cramer, all soybeans are imported, soybean meal is exported, and necessary operational supplies (fuel, hexane, caustic soda) must be imported. All this adds to the cost.

[2]Table 11, Appendix F.

oil rather than by crushing soybeans, if the Price-Waterhouse projected costs (Table 11, Appendix F) are to be believed. Whether SODEXOL imports all soybeans or a combination of soybeans and crude oil, neither alternative outweighs the other in terms of generating the required margins. SODEXOL can not constrain its costs, so it will continue to operate at a deficit position and will not be able to make its required return on investment.

Price of Lard and Lard Substitutes[1]

Average retail prices of lard and lard substitutes are shown in Figure 8. These prices reflect the same general step process as with the edible vegetable oils. This step process ended in mid-1982 with a one-third decline in average retail prices. This substantial decline in prices was undoubtedly brought on by the decimation of the Haitian swine population due to African Swine Fever. Since that time, prices have begun to recover and are moving upwards in what appears to be a new step process pattern.

As shown in Table 2, presented earlier in this section, lard products and lard substitutes are generally priced higher than liquid edible oils, with the exception of 1978, 1979, and 1982. These first two specific instances were the result of a step increase in the average retail price of edible oil two years prior to the first step increase in lard and lard substitute products in 1980. The 1982 difference is most likely due to the dramatic fall in lard prices as explained in the preceding paragraph.

The various products within this group compete primarily with each other. Because of a generally higher price and quality, the market is specific, and competition between this group of products and liquid vegetable oils appears to be minimal.

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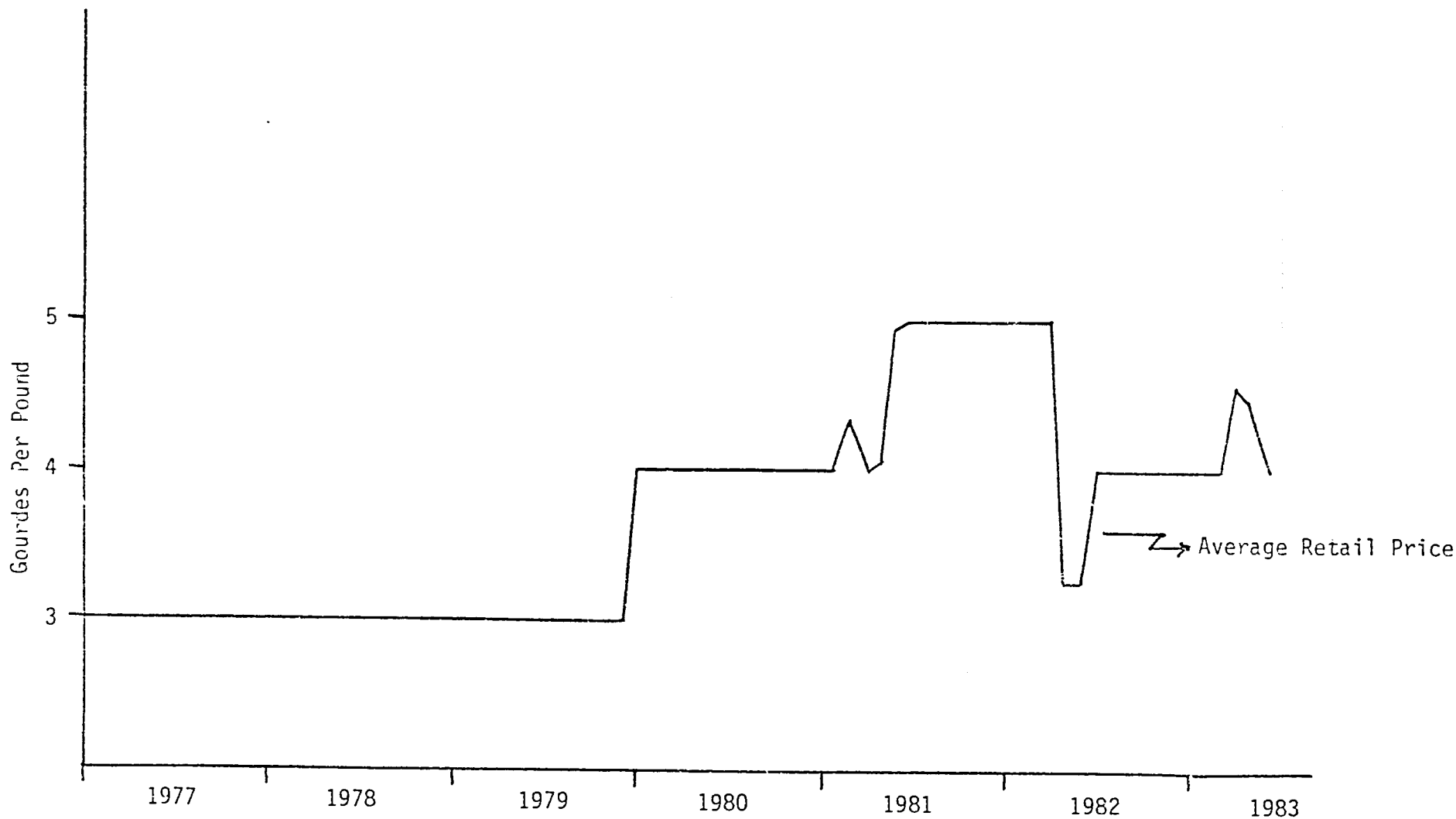
[1]This includes lard and such competing products as beurre de cuisine and shortenings. These competing products are generally made of hydrogenated vegetable oils and animal fats, depending on specific formulations.

Figure 8. Average Retail Prices of Lard and Lard Substitutes



No analysis of margins can be made for this group of products because of the lack of data.

Price of Oilseeds

The specific pricing of oilseeds can not be illustrated due to the lack of information. Peanuts are the major oilseed produced, yet no data exist on the price of peanuts as they move through the food marketing channels. The study team made a limited survey of peanut prices at wholesale markets. When expected marketing margins[1] are subtracted from the wholesale level prices, the results indicate that the minimum probable price received by the producer is in excess of $400 per MT[2] for peanuts sold in the food marketing system. SODEXOL reports buying peanuts for oil processing in 1982-83 at a price of $350 per MT unshelled or $450 per MT shelled.[3]

Average U.S. farm prices for peanuts in the shell and CIF Rotterdam prices for shelled peanuts are shown in Table 5, Appendix F. Average U.S. farm prices, CIF Rotterdam prices, and local Haitian producer prices are all above the price which SODEXOL can afford to pay. The price that SODEXOL can afford to pay is limited by high operating costs and a price comparable to the price of imported soybeans.

The price that SODEXOL could offer for peanuts is further limited by the shelling percentage of peanuts purchased, the average oil content in peanuts purchased, and the export price received for peanut meal. Calculations reveal that for every decline of one percent in shelling percentage, SODEXOL's processing margin will shrink by $5.77 per MT of peanuts processed. For every decline of one percent in the average oil content, SODEXOL's processing margin will

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[1]T. Roe.

[2]Prices range from $430 to $683 per MT.

[3]SODEXOL's purchases amounted to only 20 MT in 1982-83.

shrink by $2.81 per MT of peanuts processed. For every one percent that peanut meal is discounted in price, SODEXOL's margin will shrink by $0.24 per MT of peanuts processed.

Based on samples of peanuts inspected by the study team, the maximum price that SODEXOL could pay for peanuts produced in Haiti is as follows:

	Per MT shelled peanuts processed
0.424 MT[1] oil at $1,295/MT	$549.08
0.55 MT[2] meal at 168.30/MT[3]	92.57
Total revenue	$641.65
Required margin[4]	-154.19
Shelled peanut price	$487.46
In-shell peanut price (67% shelling rate)	$326.60

Since SODEXOL is currently paying $450 per MT for shelled peanuts plus transport to the mill, the above implies that SODEXOL can not pay more., SODEXOL's price of $300 per MT for peanuts in the shell or $450 per MT for shelled peanuts is based on an approximate shelling percentage of 67 percent. Study team samples indicate that the shelling percentage of Haitian peanuts may not be more than 64-65 percent. If shelling percentages are as low as 64-65 percent, this would indicate that SODEXOL's current price is valid.

Because of all the limitations described, one can not compare the price SODEXOL pays for peanuts to the price it pays for imported soybeans. This is

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[1]43 percent extraction rate, 42.4 percent semi-refined oil.

[2]2 percent loss factor.

[3]Average world price (6 years) of peanut meal discounted 15 percent ($198 x .85).

[4]Table 11, Appendix F (103.48 x 1.49). Note that costs are increased because extractor capacity would be reduced by one-third as compared to soybeans.

because a rational margin structure must be used to establish a price that can be paid. Because SODEXOL is not meeting its required margin for soybeans, it is not making a profit.[1] If SODEXOL were to do the same with peanuts, the resulting price for peanuts would amount to subsidization of producer prices.

Consumption of Oilseed Meal Products

Until recently, the only oilseed meal product available in Haiti was cottonseed meal, which was processed through the Institut de Développement Agricole et Industriel (IDAI). Since the advent of SODEXOL in 1981, oilseed meal has been readily available in the form of soybean meal. However, without a domestic market, SODEXOL must export 98 percent of the soybean meal it produces as a by-product of its oil extraction process.

Originally, SODEXOL was to supply soy flour to the Minoterie d'Haïti for incorporation into the wheat flour being produced. This was apparently for the purpose of increasing the protein content in bread products so that the nutritional level of the Haitian consumer could be improved. SODEXOL has the capacity to produce 7,500 MT of soy flour per year. Its planned target of production was 4,000 MT per year, which would correspond to a 3 percent level of soy flour in the wheat flour. However, to this date, SODEXOL has not produced any soy flour because of the mill's refusal to incorporate soy flour into the wheat flour being produced.

Approximately 2 percent of SODEXOL's oilseed meal production is being sold domestically to the feed mill. This amounts to a domestic consumption of 1,300 MT per year for 1981-82 and 1982-83. The balance of the meal produced by SODEXOL is exported to other locations in the Caribbean Basin, primarily the Dominican Republic, Puerto Rico, and Venezuela.

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[1]Tables 12 and 13, Appendix F.

Since domestic consumption of oilseed meal is so limited, the meal produced in the oil extraction process must be exported. Because of this fact, SODEXOL is limited in the type of oilseeds it can process. As shown in Table 1 of Appendix B, there are differences in the quality of oilseed meals. Only three meals can be considered as being of high quality: soybean, peanut, and cottonseed. Because of its high fiber content and other characteristics, cottonseed meal is limited to ruminant animal consumption. The feeding characteristics of peanut meal dictate that it either be consumed by ruminant animals or be blended into prepared animal feeds for non-ruminant animals. Because of these restrictions, soybeans have been selected as the raw material for oil extraction (even though it is one of the oilseeds with the lowest percentage of oil content). The soybean meal is of high quality and can be fed directly to all types of animals (ruminant and non-ruminant). The non-ruminant aspect is especially important, since the principal livestock in the Haitian agricultural sector are poultry and hogs, and since SODEXOL's export market is the Caribbean Basin, where ruminant animals are not predominant because of climatic and health conditions. Therefore, SODEXOL is locked in to soybeans regardless of the fact that they may not be the ideal choice of oilseed from the standpoint of extraction of edible oils.

SECTION II

Data Availability

On the whole, the data available concerning oilseeds and edible oils and fats can be classified as insufficient in both quantity and quality. Without a sound set of baseline data to assess past progress and evaluate the current situation, neither development projects nor changes in policy direction can be expected to achieve any measure of success. The study team, having reviewed a great amount of relevant and irrelevant information, finds that certain specific deficiencies in data availability should be addressed in the development process carried on by donor agencies. The study team is surprised at the lack of interest shown in this area by all parties concerned.

Quantity and Quality of Data

A general lack of data exists in the area of oilseed production, and the statistics that are available are suspicious due to their collection by means of short-term survey techniques.

Data on consumption have basically been obtained through small sample surveys, and these data can hardly be considered reliable since they become distorted when comparing them to the population as a whole or by urban/rural or geographical setting. The lack of a consistent set of household budget surveys prevents any sound analysis as to market size for different products, or trends in the consumption process.

There are large quantities of import data available, but the quality of these data defies description. Different data series and sources have never been reconciled, and as a result the quality of available information concerning imports is suspect.

Not only is the quantity of processing data insufficient, that which is available also lacks the necessary description to be able to use it effectively. The time series are not long enough to give an accurate reflection of the situation, the data are not separated into the proper categories, and the information is not well enough defined by time to allow a shift in calculations from calendar year to fiscal year and vice versa.

Price data are entirely lacking. The only prices that are collected on edible oils are average retail prices in the Port-au-Prince area. The use of this data series is complicated by the lack of a standard measurement system.

One can not contrast or compare data sets because of differences in time periods, length of data series, and differences between origins of data sets. To the best of its ability, the study team has presented in the appendices all data sets it was able to find concerning the oilseed and edible oil sector, and has thus amalgamated certain of these sets to derive trends. The study team is nonetheless fully aware that such procedures do not accurately reflect the true situation. While one could expound further on the current deficiencies of the data system, the important point here is to realize that this weakness in the system exists and to do something about these discrepancies.

In view of the foregoing, the study team herein sets forth a series of data requirements that are necessary to the full understanding of the oilseed and edible oil sector. The study team is cognizant of the fact that such needs can not be satisfied immediately, but rather must be addressed through the long-term development process.

Evident Needs

The evident needs for improvements in the data system concerning oilseeds and edible oils and fats can be ranked as follows:

1. Reconciliation of import data.
2. Household budget studies, which entail not only consumption data, but also prices for all food and non-food items consumed within the household.
3. Production surveys to update past work and better refine data on area cultivated and yields of oilseed crops.
4. Price surveys, which ascertain data on prices for oils, processed vegetable and fat products, and oilseeds. These price surveys should include processor, wholesale, and retail prices.
5. Market studies to define marketing channels, volume flows, and handling procedures.

Since there seems to be considerable interest in the area of production of certain oilseed crops, determining the current levels of cultivation, yield, and production should be of vital concern.

The other important area is the market size for the different product groups, and this can only be determined through correctly designed and administered marketing studies and household budget surveys. Market sizes are important not only in order to assist the edible oil industry in serving consumer needs, but also to direct policy actions which will enhance this effort. Any attempt to determine market size by any other approach demonstrates a total lack of understanding on the part of those concerned.

Given the necessity of oilseeds and edible oils and fats in the Haitian diet in terms of health as well as in terms of improving caloric and protein intake to recommended levels, there is an obvious need to determine current status and how the constraints of price and income affect the total system.

SECTION III

Future Potentials

Even though available data can not give a totally accurate picture of the situation, it is nonetheless obvious that the market for edible oils in Haiti will continue to grow. The basic decision that must be made is whether these increased quantities of oil can be supplied through domestic resources, through continued imports, or perhaps through an integrated approach using a combination of these two options. The set of policies governing this sector of the economy will differ depending on how the market is supplied.

Production

The potential for any meaningful increase in the production of oilseeds in the future is very limited. Several major constraints exist which prohibit any dramatic increase in production.

The first and most evident constraint is in available land area. The land area devoted to the cultivation of the ten major crops exceeds the stated arable land by 10 percent.[1] Total cultivated area exceeds arable land area by 35 percent. Approximately 84.2 percent of arable land is used to grow cereal grains.[2] If the arable land base has already been exceeded, and if concerns are being voiced about soil erosion problems and the need for soil conservation, this means that any intensive push to expand oilseed acreage will further aggravate the problem, especially given the cultural practices traditionally used in Haitian agriculture. Any increase in oilseed production area would have to come at the expense of other vital food crops.

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[1]Tables 5 and 6, Appendix B.

[2]USAID.

The second limitation is that of yields obtained from crops. Current cultural practices as described in Section I negate the possibility for vast improvements in yield levels. In order to dramatically and rapidly increase yields, monoculture practices will have to be introduced. This will require plantations or cooperative-style farming. Given the current structure of the agricultural production sector, this is not feasible, either from a social or food consumption point of view.

Even with the use of inputs and improved management practices, yields still dictate the economies of the situation. Predicted production costs for a peanut production project are stated to range from $546 to $862 per hectare.[1] Even taking the lower of these projected costs, the economic feasibility of such a project does not look promising.

Given the following yields per hectare, the resulting costs per ton of production indicate that peanut yields would have to exceed 1,800 kg/ha in order to be competitive with imported soybeans.[2]

Yield (kg/ha)	Cost per ton of production ($)
870	627.23
1,000	545.69
1,500	363.79
2,000	272.85
2,500	218.28
3,000	181.90

In order for the producer to earn a reasonable return on his investment, he would have to achieve a production level of 2,000 kg/ha. This is nearly three times the current stated average yield.[3]

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[1]SODEXOL, Feasibility Study on the Cultivation of Peanuts.

[2]Based on a comparison of oil content and potential meal value between soybeans and peanuts.

[3]Table 3, Appendix P.

The third constraint to be considered is which oilseed crops can be cultivated. As shown in Table 1 of Appendix B, there exists a fairly large number of potential oilseed crops which are more or less adaptable to the growing conditions in Haiti. The limitation that exerts itself here is the need to export the by-product of oil extraction, the oilseed meal. For reasons stated earlier, it is more difficult to find an export market for certain meals.

The fourth constraint is that government policy in the area of oilseed production is not well defined. The current Five-Year Plan simply states the following:[1]

Projections of Production for 1981-86

Oilseeds	1981-82	1982-83	1983-84	1984-85	1985-86
(MT)	4,320	8,640	12,960	17,280	21,870

The Five-Year Plan also states that the Agro-Industrial Project will produce 30,000 MT of oilseeds, especially soybeans and peanuts. This is totally in conflict with existing circumstances.

The feasibility of increasing oilseed production in order to supply oilseeds to SODEXOL is considered to be non-existent. Both technically and economically, such an undertaking is considered by the study team to be infeasible because of the constraints set forth in this study.

However, oilseed production, especially peanuts, can play an important role in the area of food production. As set forth in the following subsection, levels of direct oilseed consumption are projected to rise to 42,100 MT per year by 1985-86, and 59,800 MT per year by 1990-91. This is an annual growth rate of 4.5 percent for the period of 1980-81 to 1985-86, and 7.0 percent for 1985-86 to 1990-91. Since peanuts currently appear to make up approximately 80

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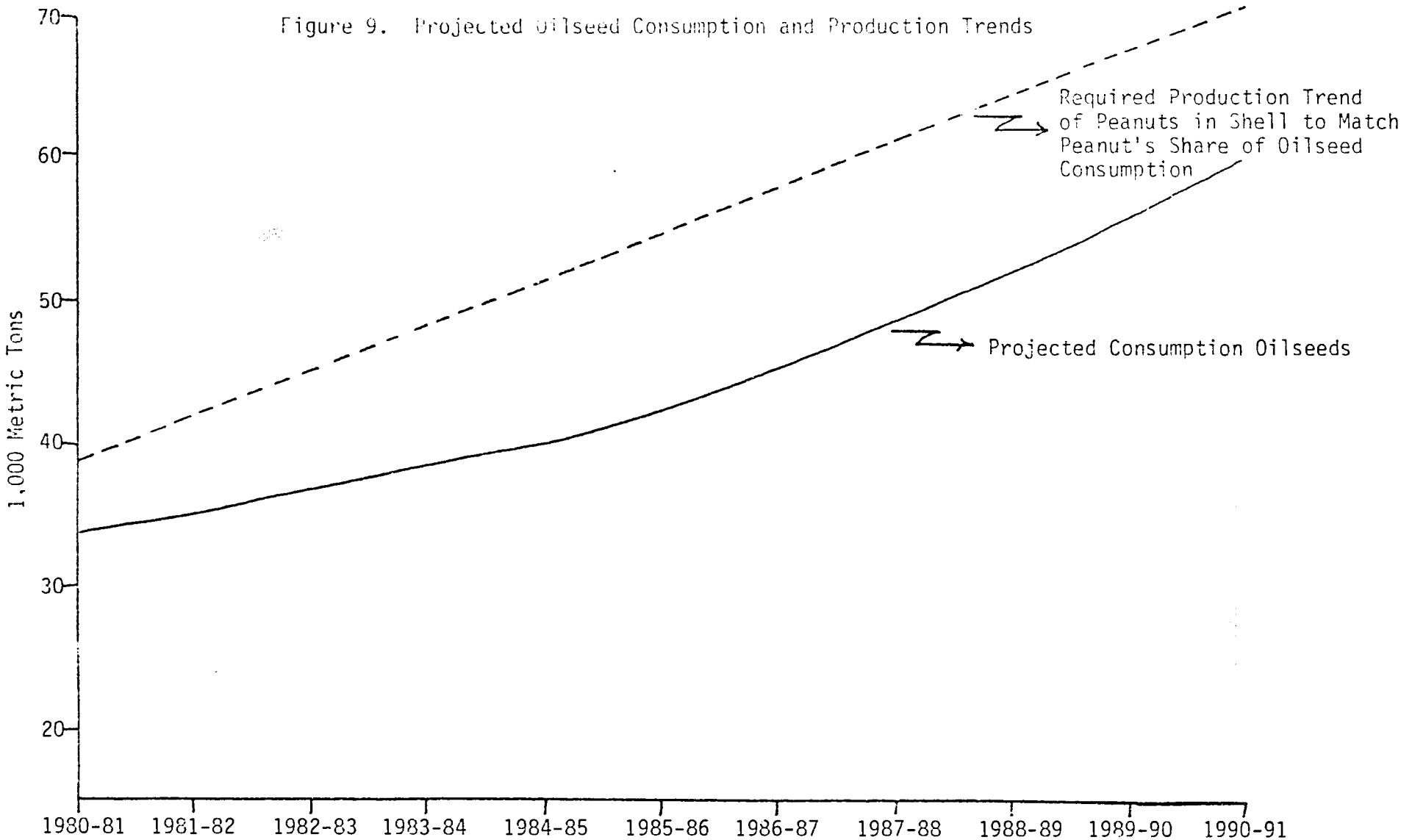
[1]Note that these production targets in no way reconcile with any of the production statistics available.

percent of direct oilseed consumption, appropriate action should be taken to encourage peanut production directed towards the goal of increasing the quantities of peanuts available for direct consumption. The consumption of peanuts in the form of oilseeds rather than in the form of processed oil provides for a greater protein intake while still providing the fatty acids necessary in the diet. Encouraging peanut production for direct consumption would reinforce the traditional crop structure of the Haitian agricultural sector, rather than trying to introduce a new crop into the already diversified mix of crops grown.

If peanuts remain at their calculated percentage level of total oilseed consumption (peanuts are calculated to make up 80 percent of the oilseeds consumed directly), this means that in order to satisfy the projected consumption of oilseeds, as illustrated in Figure 9 and as discussed in the following subsection, peanut production will have to show an average annual growth rate of nearly 7 percent. This production trend, also illustrated in Figure 9, results in a production level of 70,300 MT of peanuts by 1990-91.

In order to achieve this level of production which will support the increased consumption of oilseeds, there are two aspects of production which are normally addressed: land area under cultivation and yield. The easiest solution would be to expand the land area devoted to peanut production. If there were no land constraints, yields could remain the same and the larger land area would increase production so the total objective could be achieved. Unfortunately, Haiti does not have the luxury of unused arable land, as has been previously discussed. Therefore, it must be assumed that land area devoted to peanut production will remain relatively stable, and the only feasible solution will be to increase the average yield per hectare. In order to keep pace with the projected consumption trend, peanut yields will have to increase to between 1,[illegible]0 and 1,500 kg/ha by 1985-86, and to between 1,501 and 1,800 kg/ha by 1990-91.

Figure 9. Projected Oilseed Consumption and Production Trends



These yield ranges are based on the possibility of slight acreage increases which might be feasible.

Even given the calculated production trend presented in Section I (which the study team considers unreliable), this event will not be able to happen without intensive assistance in this sector for the specific goal of increasing peanut production for direct consumption.

Consumption

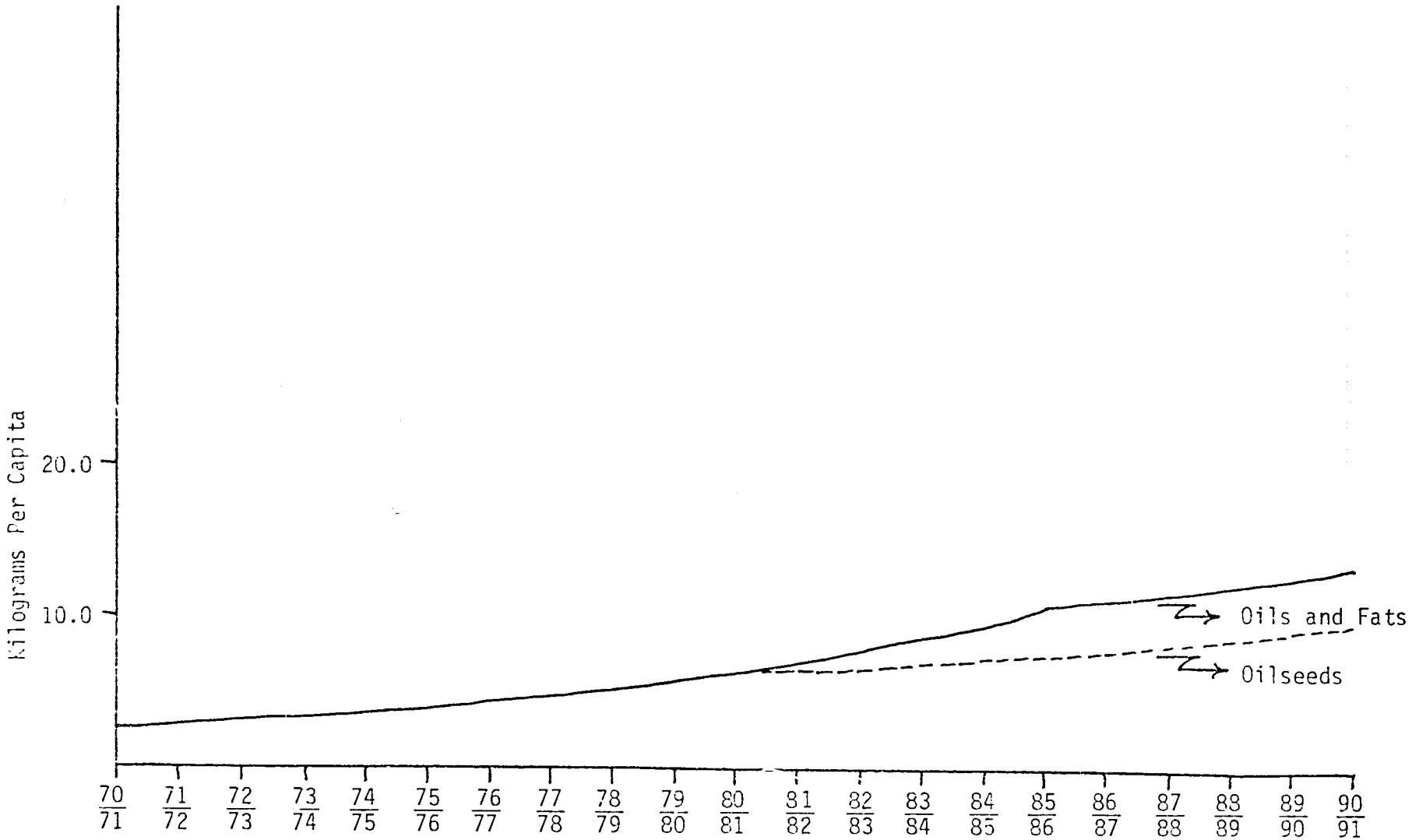
The discussion of future consumption will be divided into the consumption of oils and fats, and the direct consumption of oilseeds.

UPAP has projected the per capita consumption of oils and fats in two time segments, 1981-82 to 1985-86 and 1986-87 to 1990-91. These projections of per capita consumption levels are as follows:

Year	Per capita oil and fat consumption (kg)
1981-82	7.3
1982-83	8.0
1983-84	8.8
1984-85	9.6
1985-86	10.6
1986-87	11.1
1987-88	11.7
1988-89	12.3
1989-90	12.9
1990-91	13.6

The annual growth rate of per capita consumption of oils and fats for the period 1981-82 through 1985-86 is 9.5 percent. This growth rate matches the study team's trend analysis of past consumption of oils and fats presented in Section I. The annual growth rate for the period 1986-87 through 1990-91 is 5.[illegible] percent, which is indicative of the fact that as consumption increases over time, the population is becoming ever closer to reaching its recommended level of consumption. This growth pattern is illustrated in Figure 10.

Figure 10. Consumption Trends for Oils and Fats and Oilseeds



The following table shows the total tonnage of oil and fat consumption resulting from the projected trends.

Total Oil and Fat Consumption (MT)

Year	UPAN forecast	Study team forecast[1]	UPAN recommended consumption level
1985-86	59,500	56,800	76,300
1990-91	84,700	78,600	84,700

UPAN has made the following projections for oilseed consumption.

Year	Per capita consumption (kg)	Total consumption (MT)
1985-86	7.5	42,100
1990-91	9.6	59,800

This consumption trend is illustrated in Figure 10.

The annual growth rate of per capita consumption of oilseeds is 2.6 percent for the period 1981-82 to 1985-86, and 4.9 percent for the period 1986-87 to 1990-91.

In terms of satisfying the requirements for caloric intake, the projected trend in per capita consumption patterns for oils, fats, and oilseeds will allow for an increase of 99 calories daily in 1985-86, and 181 calories daily in 1990-91.

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[1]If the projected per capita consumption in the UPAN study is multiplied by projected population levels (based on Appendix E), a smaller total consumption is derived. If the total consumption forecast by UPAN is divided by projected population levels, the resulting per capita consumption levels are 11.1 kg and 14.6 kg for 1985-86 and 1990-91, respectively. The differences between the UPAN forecasts and the study team's forecasts amount to 4.5 percent for 1985-86 and 7.2 percent for 1990-91. The study team believes that the UPAN report is well done and that such discrepancies are really due to the lack of a data base and the approach taken to the problem. Therefore the study team finds no fault in using UPAN's work as a basis for projected consumption trends of both oils and fats, and oilseeds.

Year	Daily caloric intake (calories)			Percent of recommended intake of 2,200 calories per day		
	Oils and fats	Oilseeds	Total	Oils and fats	Oilseeds	Total
1985-86	248.88	42.12	291.00	11.3	1.9	13.2
1990-91	319.32	53.92	373.24	14.5	2.5	17.0

Depending on which calorie base is correct (Section I), this increase in caloric intake will bring the daily per capita caloric intake up to a level of between 91 and 100 percent of recommended levels, without considering any increases in the consumption of foods high in carbohydrates.

While total caloric intake appears to be reaching the level of meeting recommended requirements, the level of protein intake is considerably lower. At present, 68.5 percent of protein requirements are being met, of which oilseeds make up 1.5 percent. From a nutritional standpoint, the Haitian population is more deficient in the quality of its caloric intake than in the number of calories consumed. It would seem, therefore, that the direct consumption of oilseeds such as peanuts, and oilseed derivatives such as high-protein soy flour, would do more to improve the nutritional level of the diet, than consuming these products in the form of processed oil, which has a high caloric content but a low protein level.

In summary, if correct and judicial decisions are made concerning project planning, considerable benefits to a large segment of the local population will result. Oilseeds and oils and fats, when consumed in combination with other food groups, can make an essential contribution to the improvement of the Haitian diet.

Import Needs

Since there is no possibility of using domestic production of oilseeds to supply the needs of the edible oil extraction plant, all requirements of raw materials for the edible oil sector in the foreseeable future must continue to

be met through imports. These imports can be in the form of soybeans, crude soybean oil, semi-refined soybean oil, or some combination thereof.

Given the current calculated market size for edible oils of 29,500 MT for 1983-84, the projected growth rates for consumption shown in the preceding subsection will result in the following minimum market sizes for 1985-86 and 1990-91:[1]

1985-86	36,000 MT
1990-91	49,800 MT

SODEXOL's current crushing capacity limits its output of semi-refined oil t approximately 28,500 MT annually. This leaves minimum requirements for oil imports of 7,800 MT per year by 1985-86 and 21,300 MT per year by 1990-91. These imports could be in the form of crude soybean oil or semi-refined soybean oil, and this oil could be imported either through SODEXOL or through the private refiners.

Future market sizes for lard and lard substitutes can not be determined due to the lack of knowledge about the current market size. Given this limitation, the best that can be said is that all required animal fats for products processed in Haiti must continue to be imported, as has been the case in the past.

Processing and Marketing Needs

Edible oil processing which currently takes place in Haiti consists of oil extraction and oil refining. To date, extraction of oil from imported soybeans at the SODEXOL facility has proven to be an uneconomical venture. Although current circumstances could be improved by the development of a domestic market

[1]These projected market sizes are further below projected consumption levels than expected. This differential is due to the use of the 29,000 MT base in 1983-84 for projecting market sizes. Nearly one-half of this difference is due to higher consumer prices for oil brought about by the market distortions discussed in Section II.

for the soybean meal produced at this facility, there is no reason to believe this will happen in the near future. Since SODEXOL is probably functioning as efficiently as it can given the nature of its operating costs, the operation will undoubtedly continue. However, it is evident that no other extraction plants should be built.

Refining capacity amounts to approximately 85,000 MT annually in the private sector. Only 33 percent of this capacity is currently being utilized. SODEXOL also has the capability to do complete refining at its facility. The private sector capacity alone can handle the expected market size for edible oils over the next decade. Therefore no basic needs within this area are indicated.

No immediate needs in the marketing system for oils and fats are seen by the study team at this time. The marketing system appears to be efficient in terms of relative costs.[1] Margins at the different levels of the marketing channel are considered minimal and even inadequate in some cases. Average retail prices, as discussed in Section I, reveal that the consumer has fared well in this marketing system.

The marketing system is also effective in delivering a quality product to the consumer at a reasonable price. Given the structure and workings of the marketing system and the low opportunity cost of labor, there is nothing in the system that needs dramatic improvement at this time.

Any distortions in the marketing system are caused by SODEXOL's entrance into the market. Unfortunately there is no immediate solution to this problem since SODEXOL does exist and will undoubtedly continue to operate. Possible short-run policy options leading to changes in the current situation are discussed in Section IV.

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[1]In terms of resources that have to be imported and thereby increase costs. Such resources are raw materials, refining materials, equipment, fuel, and managerial talent.

If any actions are being contemplated to introduce new methods into the marketing system, such as the proposed rehabilitation of the Central Market in Port-au-Prince, the consequences of such projects need to be investigated prior to undertaking any action. Such projects are dangerous if conceived and implemented without thorough knowledge of the system gained through complete marketing studies. In the absence of these studies, such undertakings will assuredly cause further distortions in the marketing system and reduce the efficiency and effectiveness of the system. Many such distortions can be found in marketing systems in developing countries because of an irrational approach to what someone outside of the system considered to be a problem.

Use of Oilseed Meals

As far as can be foreseen in the near future, there will be no change in SODEXOL's need to continue exporting the soybean meal produced at its facility. However, the availability of considerable quantities of soybean meal in Haiti creates two opportunities which should not be ignored for increasing the nutritional level of the local population.

The first is the use of soy flour, a high-protein product, as part of the human diet. Since per capita protein intake in Haiti is well below recommended levels, this approach could lead to an increase in protein intake and help bring the population closer to an acceptable nutritional level. The blending of soy flour into wheat flour should be undertaken to support this effort towards nutritional improvement in Haiti.[1]

Research into soy flour derivatives such as TVP, protein isolates, and spun vegetable protein should be undertaken so as to determine if such products can be incorporated into the Haitian diet over time. These types of products

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[1]To support this approach, a cost-benefit study should be carried out on this project. This will require data bases and processing costs different from those presented in this report.

would also contribute to the increase of per capita protein intake and to the improvement of the general nutritional level in Haiti.

The second opportunity deals with the area of animal production. The repopulation of the national swine herd allows the opportunity to change current producer habits from traditional animal production to intensive animal production. Intensive animal production will require the use of protein supplements such as soybean meal.

Both of these opportunities are long-range projects. They will not generate a large volume of domestic sales of meal products either immediately or over the next decade. However, they do form the basis for (1) creating a domestic market for soybean meal, and (2) benefitting the human population thorugh improved nutritional levels coming from the increased consumption of vegetable and animal proteins.

SECTION IV

Policy Actions

It is not possible to discuss how government policies will affect different segments of the population, since available information is not sufficient to allow one to do so. Since the population of Haiti is mainly rural (75 percent) producers and consumers can not be separated. It must be considered that the majority of the people are both producers and consumers. Therefore, the necessary approach is to look at the total policy picture in general.

The overall past policy of the Government of Haiti concerning oilseeds and edible oils and fats can best be characterized as being a policy of laissez faire. This has allowed for the establishment of a competitive processing and marketing system for edible oils and fats which has well served the consumer in terms of product type, quality, and price. On the whole, it may be said that this was a sound approach. However, three specific policy actions of the GOH in the edible oil and fat sector have failed to enhance the overall functioning of the system and have, in effect, caused market distortions.

The first policy consists of having no policy at all directed towards the integration of oilseed production into the food crop system. This is in essence a policy of doing nothing. The second is the establishment of a ceiling on the price at which the refiner can sell liquid vegetable oil. This may have been thought to prevent inordinately high oil prices to the consumer. However, price ceilings generally result in these ceilings becoming the established price against which discounts are given. The results in this case are even more complex because of the government's third policy action of allowing SODEXOL to enter the edible oil sector as a quasi-public corporation with monopoly rights over all imports of oilseeds and crude or semi-refined edible vegetable oils.

It is stated that the basic purposes of SODEXOL were to encourage domestic oilseed production and assure a supply of edible oil to consumers. The first purpose has never materialized, and although the facility is currently operating and providing edible oils to the market system, it is a high-cost, uneconomical operation.

These two government policy actions, the introduction of SODEXOL into the edible oil sector and the establishment of the refiner price ceiling for refined oil, have combined to produce a detrimental impact on refiners and consumers alike. An analysis[1] of the world prices for soybean oil shows that prices declined from the last quarter of 1980 through the first half of 1983. A comparison of these world price declines to the average retail price of edible oil in Haiti since the beginning of SODEXOL's operations in September 1981 reveals a startling loss within the system. During this period of time it is calculated that Haitian consumers paid at <u>least</u> $4.4 million more for edible oil than if the past system of private refiner imports of semi-refined oil had remained intact. Refiners would have been able to maintain adequate margins amounting to a total of $5.3 million over this time period. In all, the policy decision to introduce SODEXOL into the edible oil sector cost the system nearly $10 million over a fifteen-month time span.

Even though the consumer was faced with a constant real price for edible oil in 1976-1983,[2] it would be expected that without the above conditions, real prices would have actually declined in 1982 and 1983, thereby enabling the consumer to purchase more oil without expending a higher percentage of his income.

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[1]See Prices and Margins of Edible Oils in Section I, specifically the relationship between world prices and average retail prices in Haiti for edible oil.

[2]Section I, Consumption.

Calculations reveal that the Haitian consumer would have been able to purchase nearly one-half kg more edible oils and fats per year than was possible under the existing system.

It is all well and good to be concerned about the welfare of the Haitian consumer, but as is evident from the above discussion, the time for concern and for questions to be asked was four years ago before the SODEXOL project was implemented. All these aspects should have been considered by donor agencies long before now.[1] At present it is too late to try and rectify the situation since the existence of all the elements must be accepted as given.

Considering the scenario that has been presented in this report, the study team will set forth in this section a series of policy options for USAID's consideration concerning oilseeds and edible oils.[2] These policy options are intended to be used as guidance tools, and it should be recognized that within these specific options, further analyses are required to determine the trade-offs involved in the implementation of a set of policy actions.

Production of Oilseeds

Three policy options exist in this area: (1) maintain the status quo, (2) develop domestic oilseed production for processing into edible oils, and (3) develop oilseed production for direct consumption as a food product.

The first option describes what has happened in the past, and basically consists of negligence of the entire sector. This is not considered to be a sound approach to the problem.

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[1]It has been and currently is stressed by the World Bank that the only efficient and profitable oil extraction facilities are those located near a source of raw materials.

[2]The discussion will be limited to liquid edible oils and will not include solid products such as lard and lard substitutes. The reason for this is threefold. First, there is a narrow market for solid products. Second, there has been no direct intervention by government in this area to date. This implies that the existing system is still efficiently and effectively serving the Haitian consumer.

The second option has been shown to be unfeasible given the current condition of the Haitian agricultural sector. Any policy actions taken in this direction are bound to have profound detrimental effects on the production of other vital food products.

The third option is the only feasible approach to oilseed production in Haiti. Peanuts are the predominant oilseed produced by Haitian farmers and already comprise a part of the Haitian diet. Therefore, emphasis on peanut production is the only practical choice for undertaking improvements in oilseed production. The process of increasing peanut production must be part of an integrated approach to improving the production of all food crops, of which peanuts make up a small percentage. This integrated approach must be carried out under a set of policy actions intended to raise yield levels for all types of crops. This implies the use of technical inputs along with improved varieties and improved cultivation techniques.

Production of Edible Oils

There are basically no policy options for the production of edible oils, since as has been shown in this report, domestic production of oilseeds to supply raw materials for oil extraction can not be accomplished in Haiti and therefore the edible oil industry will have to continue to rely on imports of either soybeans or crude soybean oil. With the existence of both SODEXOL and private refiners, there is sufficient capacity to handle all refining needs. Therefore, the only policy considerations in the area of edible oil production deal with price. These policy options will be addressed in the later subsection on prices.

Importation of Edible Oils

Policy options concerning the importation of edible oils can be divided into two categories: PL 480 imports and commercial imports. Under current conditions, there are basically only two policy options from which to choose, both of which involve PL 480 imports.

The first policy option is to supply PL 480 imports of degummed crude vegetable oil to SODEXOL. SODEXOL would then resell this imported crude oil in the form of semi-refined oil to the private refiners at the current price of $1,295 per MT. Selection of this policy option would result in no monetary benefit to SODEXOL, as explained in Section I and as shown below:

CIF price crude vegetable oil	$ 675/MT
Import duties	223/MT
SODEXOL's required margin	400/MT
Total costs	$1,298/MT

The only way SODEXOL could profit from PL 480 shipments is if the crude oil were supplied without import duties or at a CIF price of less than $675 per MT (which is unlikely given the current state of the world market). This policy option will have no effect on consumer prices, either positively or negatively. It will, however, support the GOH (who now owns, or will own in the near future, over 50 percent of SODEXOL) in maintaining the relative financial viability of the SODEXOL operation.

The second policy option for the importation of PL 480 vegetable oil is to supply the PL 480 imports directly to the private refiners in the form of semi-refined oil. The consequences of this policy option would undermine the GOH and SODEXOL since these direct imports by the refiners would replace the oil they currently buy from SODEXOL, and as a result SODEXOL's unit costs would rise. If SODEXOL's losses were to increase any more than at present, this

could give the GOH an extremely bad image as a project manager, and could lead to conflicts between the GOH and USAID on other projects.

Whether or not this policy option would lower consumer prices is debatable. If all edible oil needed to meet the market demand were imported, a decline of between 7 and 11 percent in the average retail price of edible oil could be achieved. However, since PL 480 imports would probably make up less than 25 percent of the total market demand, the refiners would most likely spread these imports among their necessary purchases from SODEXOL in order to achieve their required operating margins. The expected margins would be as follows:

CIF price semi-refined vegetable oil	$ 700/MT
Import duties	231/MT
Total cost of imports CIF	$ 931/MT
Refiners direct costs (including unloading)	$ 167/MT
Refiners indirect costs	244/MT
Total cost	$1,342/MT
Total cost per barrel	$245
blend [illegible] SODEXOL	[illegible]281

In this case, the expected consumer price decline would be no more than 2 percent, given the fact that the processors often give discounts off the ceiling price.

There is simply no economic or marketing solution for choosing between the two options presented here concerning the importation of edible oil. The policy approach will have to be a political decision.

Interestingly enough, the GOH will face this same dilemma in the near future when commercial imports of oil will be required, in addition to SODEXOL's maximum output, to satisfy the growing market demand for edible oil. The same

circumstances will apply in this situation, and the decision to be made will be the same, either import through SODEXOL or through the private refiners. Since the GOH is the majority owner of SODEXOL, the decision should be relatively easy.

Prices

A series of options exists concerning actions on price policy. These options also include other types of actions which, while price-related, have other economic implications within the edible oil sector. There are five price policy options from which to choose: (1) maintain the current situation, (2) remove the refiner price ceilings while still requiring refiners to purchase all oil from SODEXOL, and let the market find its own equilibrium price, (3) retain the refiner price ceiling and allow refiners to purchase semi-refined oil either from SODEXOL or directly through imports, (4) admit that SODEXOL was an ill-conceived project, close the facility, and return to past market patterns, and (5) reduce import duties on edible oils.

The first policy option allows the current situation in the edible oil sector to stand unchanged. This option is neither good nor bad. It simply accepts the situation for what it is and allows it to continue.

The second option, while it may seem attractive to some, would simply raise prices to consumers. The study team expects the current situation to result in a new plateau for retail edible oil prices in the short run. A decision to apply this second option would simply raise prices to a second, even higher plateau as SODEXOL's inefficiencies are passed on to the consumer.

The third option holds little promise for clearing out the market distortions caused by the imposition of SODEXOL on the market system for edible oils. This option would remove the monopolistic practices imposed by the government and would force SODEXOL to act as a private enterprise operation and compete

in the marketplace the same as the private refiners. However, because of the high-cost nature of the SODEXOL facility, it will not be able to compete against imported semi-refined vegetable oils. Therefore, in order to survive, it will require governmental subsidies. These subsidies, which will have to continue into the future, will place a drain on GOH resources and will further impair the government's balance of payment position. While the expected benefit of a return to the free market system would be a lowering of consumer prices, this will in all probability be offset by an increase in import duties for semi-refined oil, which the government will find necessary in order to pay for the subsidies to SODEXOL. In the end, the consumer will have gained nothing.

The fourth option has a large immediate negative impact because of the loss of total investment in SODEXOL which the GOH must assume. However, this is a one-time loss, rather than a continuous loss through subsidies to SODEXOL over time. The return to the free market patterns would benefit consumers since the intense price competitiveness of the market would again link the retail price of edible oil to world prices, as occurred in the past. While there are those who would recoil from the loss of such massive investment, one must remember the $10 million loss pointed out earlier in this section which was caused by SODEXOL's imposition on the system. This loss is equal to two-thirds of SODEXOL's stated investment cost, and it is expected that this loss pattern will recur several times over the next decade. Benefits from this action, in addition to the above-stated reduction in marketing system costs, will be a reduction of the drain on foreign exchange, and certainly an increase in tax revenues.

The fifth option concerns itself with the import duties on edible oils. If there is a return to the free market system, and if the recently increased

APPENDIX A

Scope of Work

1. Identify import, production, consumption trends for fats and oils. Compare and contrast various data sets.
2. Identify the feasibility of domestic edible oilseed production.
3. Identify government policies affecting consumption of fats and oils and the impact of these policies on consumers (urban and rural, by income) and farmers. Provide policy guidance with regards to production, import, and pricing policies for the Government of Haiti.
4. Identify data gaps and needs for additional data collection and study.

APPENDIX B

Oilseed Production Data

Table 1

Potential Oilseeds

Oilseed	Oil Content (Percent) Average	Range	Meal Quality High	Average	Low
Benzolive		25-38			X[1]
Peanuts (shelled)	48	45-54	X[2]		
Soybeans	19		X		
Sesame	50	44-53		X[3]	
Cottonseed	22		X[4]		
Sunflower (shelled)[5]	48			X[3]	
Safflower (shelled)	50			X[3]	
Rapeseed	50				X[6]
Coconut	65	60-69			X[6]
Palm	23				X[6]

[1]Benzolive is only included in this list because of the recent intense interest in this plant. However it is not considered a feasible alternative because the meal is unusable due to its high tannin content.

[2]While peanut meal is of high quality, feeding characteristics dictate that it be blended into prepared feeds.

[3]Lysine deficient.

[4]Because of high fiber content and other factors, suitable only for ruminant animal feed.

[5]Oil content with hulls, average of 35 percent.

Table 2

Oilseed Production

Year[1]	Peanuts			Sesame			Cottonseed		
	Area (1,000 ha)	Yield (kg/ha)	Production (1,000 MT)	Area (1,000 ha)	Yield (kg/ha)	Production (1,000 MT)	Area (1,000 ha)	Yield (kg/ha)	Production (1,000 MT)
1973-74									
1974-75		512[2]	2.9		556[2]	2.0[2]			3.0[2]
1975-76		512[2]	2.2		556[2]	2.0[2]			3.0[2]
1976-77		512[2]	2.0		556[2]	2.0[2]			3.0[2]
1977-78			2.0						
1978-79			2.0[3]				13	230	3.0
1979-80			2.0				13	230	3.0
1980-81			2.0				13	310	4.0

[1]October-September year.

[2]Three-year average.

[3]ONAPI gives a production of 17,000 MT for this year.

Sources: World Bank
Zukevas
ONAPI
USDA

Table 3

Oilseed Production

Year[1]	Peanuts			Cotton			Sesame		
	Area (ha)	Yield (kg/ha)	Production (MT)	Area (ha)	Yield (kg/ha)	Production (MT)	Area (ha)	Yield (kg/ha)	Production (MT)
1976-77	27,975	581	16,226	9,156	400	3,662			
1977-78	41,339	600	24,803	12,468	400	4,982			
1978-79	47,062	720	33,868	13,626	410	5,589	13,887	297	4,125
1979-80	-	-	-						
1980-81	-	-	-						

[1]October-September year.

Sources: DARNDR, Plan Quinquennal du Secteur Agricole 1981-86
Service de Statistiques Agricoles
USAID

Table 4

1979 Yield Under Different Cultural Practices

(kg/ha)

Crop	Mixed Culture	Monoculture
Peanuts	580	870
Cotton	360	510
Sesame	287	361

Source: Service de Statistiques Agricoles
Service d'Economie Rurale et de Statistiques Agricoles

Table 5

Total Land Under Cultivation

(ha)

Year	Total	Ten Major Crops[1]
1976-77	1,247,835	886,962
1977-78	1,060,455	969,575
1978-79	1,173,000	979,143

[1]Corn, millet, rice, beans, peanuts, bananas, potatoes, coffee, sugarcane, cotton.

Source: Service de Statistiques Agricoles

Table 6

Land Area

(1,000 ha)

Total land	2,756	
Arable land	860	
Permanent crops		330
Annual crops		530
Permanent pasture	655	
Forest	235	
Other	1,006	

Source: Zukevas

Table 7

Area, Yield, and Production[1]

Major Oilseeds by Main Producers

Country	Average 1977/78-1981/82			1982/83[2]			1983/84[3]		
	Area[4]	Yield[5]	Prod[6]	Area	Yield	Prod	Area	Yield	Prod
Soybeans:									
United States	26,409	1,938	52,777	28,645	2,163	61,969	25,134	1,996	50,171
Brazil	8,300	1,517	12,594	8,600	1,715	14,750	8,700	1,724	15,000
China	7,298	1,084	7,909	8,414	1,073	9,030	8,100	1,173	9,500
Argentina	1,721	2,045	3,520	2,115	1,655	3,500	2,250	1,956	4,400
Paraguay	370	1,435	531	350	1,429	500	420	1,488	625
Others	4,246	1,121	4,758	4,597	1,177	5,409	4,785	1,182	5,657
Total	48,344	1,698	82,050	52,721	1,804	95,158	49,389	1,728	85,353
Cottonseed:									
USSR	3,057	1,579	4,874	3,188	1,568	5,000	3,200	1,594	5,100
China	4,866	995	4,839	5,828	1,235	7,196	5,850	1,265	7,400
United States	5,306	904	4,797	3,937	1,093	4,304	3,016	941	2,839
India	7,891	337	2,653	7,966	335	2,670	8,000	346	2,770
Pakistan	2,028	635	1,287	2,262	701	1,586	2,260	752	1,700
Others	9,585	736	7,052	9,035	727	6,567	9,357	757	7,087
Total	32,763	778	25,506	32,216	848	27,323	31,683	848	26,896
Peanut:									
India	7,175	845	6,061	7,300	753	5,500	7,400	851	6,300
China	2,068	1,410	2,915	2,416	1,621	3,916	2,400	1,625	3,900
United States	602	2,704	1,627	516	3,025	1,561	538	2,959	1,592
Senegal	1,084	700	759	1,082	883	955	1,000	950	950
Sudan	965	935	902	1,010	990	1,000	1,000	1,000	1,000
Brazil	265	1,473	390	200	1,125	225	200	1,300	260
South Africa	231	1,085	250	191	414	79	220	1,273	280
Others	5,217	880	4,592	4,871	897	4,370	5,002	920	4,601
Total	17,607	993	17,497	17,586	1,001	17,606	17,760	1,063	18,883
Sunflower Seed:									
USSR	4,411	1,177	5,190	4,250	1,247	5,300	4,250	1,294	5,500
Argentina	1,653	938	1,550	1,840	1,196	2,200	1,950	1,179	2,300
United States	1,507	1,382	2,082	2,054	1,296	2,661	1,276	1,501	1,915
Romania	512	1,618	828	503	1,676	843	465	1,613	750
Bulgaria	242	1,689	408	255	1,988	507	255	1,980	505
Others	3,391	1,086	3,682	4,348	1,170	5,088	4,789	1,229	5,888
Total	11,715	1,172	13,740	13,250	1,252	16,599	12,985	1,298	16,858
Rapeseed:									
India	3,810	488	1,861	4,350	575	2,500	4,400	568	2,500
China	2,845	837	2,380	4,122	1,372	5,656	3,700	1,351	5,000
Canada	2,233	1,182	2,640	1,717	1,231	2,114	2,242	1,249	2,800
Poland	303	1,783	540	258	1,674	432	245	2,400	588
France	323	2,204	712	476	2,426	1,155	467	2,298	1,073
Others	1,623	1,415	2,297	1,945	1,613	3,138	2,253	1,557	3,507
Total	11,137	936	10,429	12,868	1,165	14,995	13,307	1,162	15,468

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[1]Split year includes northern hemisphere crop harvested in the late months of the first year shown combined with southern hemisphere and certain northern hemisphere crops harvested in the early months of the following year.

[2]Preliminary.

[3]Forecast.

[4]In 1,000 ha.

[5]In kilograms per ha.

[6]In 1,000 MT.

Source: FAS, USDA

APPENDIX C

Import Data

Table 1

Imports of Vegetable Oils

(MT)

Year	Concessional (PL 480)	Commercial	Total
1973-74	400	8,600	9,000
1974-75	540	11,060	11,600
1975-76	4,212	12,500	16,712
1976-77	6,765	12,110	18,875
1977-78	5,957	12,936	18,893
1978-79	3,900	18,004	21,904
1979-80	5,132	21,329	26,461
1980-81	1,656	23,300	24,956
1981-82	2,892		
1982-83	9,356		
1983-84	1,073[1]		

[1]First quarter.

Source: USAID

Table 2

Imports of Vegetable Oils

Year	Quantity (MT)	Value ($1,000)	Cost per MT ($)	Cost per pound (cents)
1970-71	10,011.6	3,284.8	328.10	14.9
1971-72	12,529.7	3,284.8	216.16	11.9
1972-73	8,096.6	2,792.6	344.91	15.6
1973-74	5,799.4	5,343.5	921.39	41.8
1974-75	5,537.3	5,535.0	999.59	45.4
1975-76	17,286.5	10,047.4	581.23	26.4
1976-77	15,897.8	10,669.8	671.15	30.5
1977-78	12,984.2	8,200.7	631.59	28.7
1978-79	18,005.7	12,493.1	693.84	31.5
1979-80				

Source: ONAPI

Table 3

Imports of Vegetable Oils

(MT)

Year	Total Soybean Oil	Olive Oil	Cottonseed Oil	Palm Oil	Other Vegetable Oils	Total Vegetable Oils
1970-71						10,012
1971-72						12,530
1972-73						8,097
1973-74						5,799
1974-75						5,537
1975-76						17,287
1976-77	15,401	271	57	150	56	15,935
1977-78	12,056	810	46	-	-	12,912
1978-79	17,409	136	-	-	443	17,988
1979-80	20,388	496	-	-	442	21,326
1980-81	22,719	419	-	-	109	23,247
1981-82						
1982-83						

Source: ONAPI
Administration Générale des Douanes

Table 4

Imports of Soybean Oil

(MT)

Year	U.S. Soybean Oil
1976-77	15,401
1977-78	14,000
1978-79	19,000
1979-80	23,000
1980-81	18,000
1981-82	7,491
1982-83	13,041

Source: USDA

Table 5

Imports of Vegetable Oils

(MT)

Year	Total Soybean Oil	U.S. Soybean Oil
1967	4,513	
1968	7,250	
1969	6,754	
1970	7,155	
1971	8,842	
1972	10,996	
1973	7,063	
1974	7,662	
1975		12,080
1976		15,591
1977		15,516
1978		14,381
1979		18,960
1980		22,924
1981		18,398

Source: I.S. Joseph Company
USDA

Table 6

SODEXOL Imports

(MT)

Year	Soybeans	Soybean Oil (Crude)
1981-82	81,500	5,700
1982-83	78,500	13,500

Source: SODEXOL

Table 7

Cost of Imports

Soybean Oil

($/MT)

1976-77	672.35
1978-79	691.24
1979-80	781.99
1980-81	717.21

Source: Administration Générale des Douanes

Table 8

Imports of Animal Fats and Tallows

(MT)

Year	Animal Fats and Tallows	Processed Products Containing Vegetable Oils and Animal Fats
1970-71	8,035	65.0
1971-72	4,023	63.1
1972-73	3,679	150.8
1973-74	6,016	112.3
1974-75	4,119	192.5
1975-76	11,089	95.9
1976-77	10,982	480.1
1977-78	12,849	218.3
1978-79	10,471	425.3
1979-80		845.5
1980-81	13,475	937.4
1981-82	18,102	

Source: ONAPI
Administration Générale des Douanes
Walker

Table 9

Value of Imports

Year	Vegetable Oils ($1,000)	Animal Fats ($1,000)	Processed Products ($1,000)	Total Value All Imports ($ Million)
1970-71	3,284.8	2,003.4	24.2	
1971-72	3,986.2	1,305.8	28.3	
1972-73	2,792.6	1,175.6	83.4	
1973-74	5,343.5	2,894.8	83.1	
1974-75	5,535.0	2,217.4	173.0	
1975-76	10,047.4	4,884.7	85.3	
1976-77	10,669.8	4,394.6	387.5	16.66
1977-78	8,200.7	5,071.4	176.1	13.44
1978-79	12,493.1	5,910.4	387.1	18.79
1979-80				24.40
1980-81	16,841.9	9,868.8	740.4	28.10
1981-82				29.88

Source: Banque de la République d'Haïti
ONAPI

Table 10

Total Value of All Imports

Animal Fats and Vegetable Oils

($ Million)

1969	2.7
1970	3.5
1971	5.3
1972	5.3
1973	4.1
1974	8.3
1975	7.9
1976	15.1
1977	16.6
1978	13.4
1979	18.8
1980	24.4
1981	25.8

Source: World Bank

Appendix D

Processing Data

Table 1

Private Sector Refiners

Refiner	Production Capacity (MT/month)	Oil Storage (MT)
Usine à Mantèque de Port-au-Prince (USMAN)	3,200	2,000
Huilerie Nationale S.A. (HUNASA)	1,900	1,400
International Tank Terminal (ITT)	750	1,300
SIDGO	350	900
Fabrique National de Détergent et de Savons (FABNAD)	1,000	10,000
Huilerie Haïtienne[1] (LINSA group)	-	N/A
Huilerie Tropicale	N/A	N/A
Huilerie Caraïbe[2]	-	-

[1]The study team has been informed that Huilerie Haïtienne has no refinery line as such, but simply packages oil.

[2]This refinery handles exclusively lard.

Source: Walker, Study Team

Table 2

Production Capacities - SODEXOL

Process	Engineered Capacity (MT/day)	Current Operating (Effective) Capacity (MT/month)	Effective Capacity Compared to Engineered Capacity (%)
Extraction (Oilseeds)	450	11,000	80 (89)[1]
Refining (Oil)	110	3,300	100 (109)[1]

Storage Capacity (MT)	
Oilseeds	11,000
Meal	8,000
Oil	5,500

[1]Calculated on an operating year of 330 days, which allows for a 10 percent downtime for maintenance (normally required for extraction and refining plants outside of industrialized countries).

Source: SODEXOL

Table 3

Sales Volume - SODEXOL

(MT)

Year	Sales	Oil from Extraction	Oil from Crude
1982	20,000	12,500	7,500
1983	24,000[1]	13,500	10,500

[1]Current sales for 1983-84 are at the rate of 2,300 MT per month.

Source: SODEXOL

Table 4

Oil Production - SODEXOL

Month	Oil Refined from Imported Seeds (MT)	Oil Refined from Imported Crude Oil (MT)
8/81 - 9/81	716	
10/81	580	
11/81	807	
12/81	887	
1/82	1,661	
2/82	828	2,200
3/82	1,599	
4/82	1,628	
5/82	731	
6/82	1,282	1,235
7/82	1,058	
8/82	1,058	2,279
9/82	1,058	-----
	13,893	5,714

Source: Walker
Price-Waterhouse

Table 5

Private Sector Processing Volumes

(1,000 MT)

Year	Edible Vegetable Oils	Lard
1976-77	12.4	2.5
1977-78	12.6	2.3
1978-79	19.3	2.6
1979-80	18.9	3.3
1980-81	24.4	3.0
1981-82	20.4	2.5

Source: Walker
ONAPI

Table 6

Private Sector Processing Volumes

(1,000 MT)

Year	Edible Vegetable Oils	Edible Fats
1970		1.6
1971		2.0
1972		2.1
1973		1.5
1974		2.1
1975		3.5
1976	14.1	4.8
1977	12.3	5.0
1978	12.6	
1979	19.3	
1980	18.9	
1981	24.5	
1982	17.1	

Table 7

Processing Volumes

(MT)

Year	Edible Vegetable Oils		Lard	
	Amount Processed	Amount Distributed	Amount Processed	Amount Distributed
1978	16,128.8	15,684.9	2,014.9	2,269.7
1979	16,324.8	15,583.2	3,927.2	2,438.8
1980	24,101.4	22,901.1	3,600.9	3,136.3
1981	34,696.3	33,649.8	3,134.0	3,057.3

Source: Département du Plan

Appendix E

Consumption Data

Table 1

Population

(1,000)

Year	Total	Rural	Urban
1960	3,623	3,054	569
1961	3,679	3,087	592
1962	3,736	3,120	616
1963	3,796	3,152	641
1964	3,852	3,186	666
1965	3,912	3,219	693
1966	3,972	3,251	721
1967	4,034	3,285	749
1968	4,098	3,319	779
1969	4,163	3,353	810
1970	4,235	3,390	845
1971	4,315	3,435	880
1972	4,368	3,458	910
1973	4,440	3,494	946
1974	4,514	3,532	982
1975	4,584	3,565	1,019
1976	4,668	3,608	1,060
1977	4,730	3,633	1,097
1978	4,793	3,657	1,136
1979	4,857	3,682	1,175
1980	4,921	3,705	1,216
1981	4,988	3,729	1,259
1982	5,054	3,753	1,301

Annual Growth Rates

(Percent)

Year	Total	Rural	Urban
1960-71	1.6	1.0	3.9
1971-82	1.5	0.8	3.6
Total	1.5	1.0	3.8

Population Distribution

(Percent)

Year	Rural	Urban
1960	84.3	15.7
1971	79.6	20.4
1982	74.3	25.7

Source: Zubevas
Institut Haïtien de Statistique et d'Informatique

Table 2

Population in Major Metropolitan Area: Port-au-Prince

Year	Population (1,000)	% of Total Population	% of Urban Population
1971	494	11.4	56.1
1982	720	14.2	55.3

Source: Zukevas
ONAPI

Table 3

Gross National Income

Per Capita

(Gourdes)

Year	Current	Constant (1976)
1975[1]	872	853
1976	934	934
1977	975	908
1978	989	948
1979	1,140	997
1980	1,392	1,031
1981	1,524	973
1982	1,623	960

[1]World Bank estimates place average per capita income at G 985 for 1976. Other estimates (Zukevas) place per capita income at $162 for 1975, with $96 for rural sector and $385 for urban sector.

Source: World Bank
Zukevas

Table 4

Gross Domestic Product Per Capita

Year	Current Prices	Constant Prices (1955)
1960	377	420
1961	368	402
1962	377	427
1963	389	412
1964	422	400
1965	451	402
1966	445	394
1967	458	379
1968	449	385
1969	471	394
1970	481	389
1971	516	407
1972	530	406
1973	674	411
1974	772	418
1975	945	417
1976	1,105	427
1977	995	431
1978	1,046	448
1979	1,433	450
1980	1,541	512
1981	1,640	496
1982		494

Source: World Bank
Roe
Zukev s

Table 5

Protein Intake

1980-81

Food Product	Percent of Average Daily Intake
Cereal grains	37.0
Legumes and pulses	28.0
Roots, tubers, and bananas	5.6
Oilseeds	1.5
Vegetables	3.2
Fruits	5.1
Meat	9.0
Fish	4.6
Eggs	0.7
Milk and dairy products	2.9
Coffee and cocoa	2.4
	100.0
Average daily intake per capita	41.1 g
Recommended daily intake per capita	60.0 g

Source: UPAN

Table 6

World Soybean Oil Consumption

(1,000 MT)

Country	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83
United States	3,303	2,986	3,612	3,406	3,752	4,056	4,074	4,134	4,325	4,491
Brazil	675	702	800	1,025	1,110	1,313	1,426	1,484	1,408	1,550
Japan	510	445	512	547	594	609	616	666	669	725
India	22	7	62	460	487	486	765	722	448	623
China, Mainland	513	464	502	414	545	491	500	485	514	479
Germany, FGR	439	382	408	390	493	477	496	467	477	467
Iran	181	151	231	183	328	234	280	300	363	413
Soviet Union	59	47	323	367	273	273	271	304	390	253
Mexico	159	170	124	158	184	174	253	320	362	295
Italy	330	303	319	294	252	302	299	267	238	273
Pakistan	118	63	102	150	181	200	173	228	312	275
Yugoslavia	98	120	95	42	86	49	136	115	112	276
Netherlands	158	126	145	178	208	211	240	192	216	205
United Kingdom	176	152	188	195	264	236	254	225	254	184
China, Taiwan	83	112	127	116	122	143	139	156	171	170
Canada	136	124	185	132	152	153	168	150	149	155
Morocco	66	78	88	140	130	140	116	124	181	152
Peru	68	57	66	76	74	44	41	64	71	132
Colombia	31	35	31	51	63	92	120	104	134	131
Turkey	6	70	63	12	30	57	111	129	131	130
Belgium-Lux.	67	49	66	73	71	93	97	101	116	116
Egypt	22	20	47	52	40	42	53	107	46	109
Romania	35	57	74	54	73	83	117	102	84	94
France	99	89	98	100	108	107	104	115	105	94
Korea, Rep. of	3	5	18	19	26	46	42	56	77	90
Spain	228	246	241	151	104	101	111	105	100	90
Germany, East	19	9	16	49	34	63	85	65	86	85
Israel	84	82	68	69	79	77	80	78	90	83
Chile	51	93	39	35	54	50	50	81	81	82
Argentina	10	62	19	33	48	28	45	98	90	80
Denmark	40	40	45	56	59	73	59	67	78	79
Venezuela	13	7	20	9	26	45	34	65	65	70
Nigeria	0	0	0	17	61	44	63	26	62	70
Tunisia	61	54	2	10	34	82	82	77	50	65
Poland	36	26	34	23	29	66	8[illegible]	55	49	62
Sweden	48	44	49	56	57	63	62	59	61	60
Ecuador	13	9	20	21	44	34	37	48	50	53
Korea, North	23	28	29	32	39	60	42	36	44	48
Norway	39	51	40	44	40	40	46	47	48	49
Austria	28	28	36	39	41	45	45	39	43	48
Dominican Rep.	11	19	22	10	17	16	23	44	44	43
Bangladesh	35	23	45	35	19	22	66	23	47	40
Australia	18	24	40	39	38	33	43	40	45	39
Haiti	5	5	16	15	12	19	25	23	28	38
Philippines	0	2	2	2	4	6	8	6	7	10

Source: USDA

APPENDIX F

Price and Cost Data

Table 1

Consumer Price Index[1]

Year	1970 = 100	1976 = 100
1960	76.0	
1961	78.9	
1962	78.4	
1963	81.8	
1964	89.4	
1965	91.4	
1966	98.9	
1967	96.1	
1968	97.3	
1969	98.7	
1970	100.0	
1971	109.5	
1972	113.1	
1973	138.8	
1974	159.5	
1975	186.3	
1976	199.4	100.0
1977	214.2	107.4
1978	208.0	104.3
1979	228.1	114.4
1980	269.2	135.0
1981	312.3	156.6
1982	337.2	169.1

[1]CPI for Port-au-Prince weights: food 68.5%, clothing 19.53%, housing 11.91%.

Source: Zukevas
Département du Plan

Table 2

Average Retail Prices in PAP

(Gourdes)

		Lard[1] (Pound)	Oil (Liter)
1948	Base	2.49	3.50
1977	Jan	3.00	5.00
	Feb	3.00	5.00
	Mar	3.00	5.10
	Apr	3.00	5.50
	May	3.00	5.50
	Jun	3.00	5.50
	Jul	3.00	5.60
	Aug	3.00	5.10
	Sep	3.00	5.00
	Oct	3.00	4.70
	Nov	3.00	5.10
	Dec	3.00	5.20
1978	Jan	3.00	5.50
	Feb	3.00	5.80
	Mar	3.00	6.00
	Apr	3.00	5.80
	May	3.00	5.70
	Jun	3.00	5.90
	Jul	3.00	5.80
	Aug	3.00	5.80
	Sep	3.00	5.80
	Oct	3.00	6.00
	Nov	3.00	6.10
	Dec	3.00	6.10
1979	Jan	3.00	5.90
	Feb	3.00	5.90
	Mar	3.00	5.90
	Apr	3.00	5.90
	May	3.00	5.90
	Jun	3.00	6.00
	Jul	3.00	5.90
	Aug	3.00	6.00
	Sep	3.00	6.00
	Oct	3.00	6.00
	Nov	3.00	6.00
	Dec	3.00	6.30

Table 2 (continued)

		Lard[1] (Pound)	Oil (Liter)
1980	Jan	4.00	6.40
	Feb	4.00	6.50
	Mar	4.00	6.65
	Apr	4.00	6.75
	May	4.00	7.00
	Jun	4.00	7.25
	Jul	4.00	7.35
	Aug	4.00	7.46
	Sep	4.00	7.43
	Oct	4.00	7.40
	Nov	4.00	7.37
	Dec	4.00	7.41
1981	Jan	4.00	6.75
	Feb	4.00	7.20
	Mar	4.00	6.00
	Apr	4.00	6.00
	May	4.00	6.00
	Jun	4.33	6.08
	Jul	4.00	7.45
	Aug	4.09	7.45
	Sep	4.95	7.89
	Oct	5.00	8.22
	Nov	5.00	7.86
	Dec	5.00	7.85
1982	Jan	5.00	7.92
	Feb	5.00	8.03
	Mar	5.00	8.07
	Apr	5.00	8.17
	May	3.25	8.15
	Jun	3.25	8.10
	Jul	4.00	8.22
	Aug	4.00	8.29
	Sep	4.00	8.29
	Oct	4.00	8.29
	Nov	4.00	8.29
	Dec	4.00	8.29
1983	Jan	4.00	6.00
	Feb	4.00	6.00
	Mar	4.00	6.02
	Apr	4.59	6.17
	May	4.50	6.11
	Jun	4.00	6.00

[1]Including lard substitutes.

Source: Département du Plan

Table 3

Maximum Refinery Prices as Fixed by Government

Refined Vegetable Oil

($/56-gallon drum)

Year	Price
1981-82	225
1982-83	225
1983-84	293

Source: Walker Study Team

Table 4

Fixed SODEXOL Prices

Semi-Refined Oil

($/MT)

Year	Price
1981-82	950[1]
1982-83	950
1983-84	1,295

[1]Price-Waterhouse audit gives the unit sales price as $947.60, which is the sales price minus sales expenses ($988.66 - $41.06 = $947.60).

Source: Walker
Study Team

Table 5

Oilseed Prices

($/MT)

	Soybeans			Peanuts		Sunseed		Rapeseed	Copra	Linseed
	US[1]	US[2]	ROTT[3]	US[4]	ROTT[5]	US[6]	ROTT[7]	ROTT[8]	ROTT[9]	ROTT[10]
1974/75										
Average	$222	$228	$249							
1975/76										
Average	$190	$196	$215							
1976/77										
Average	$257	$267	$288							
1977/78										
Average	$223	$228	$259	$463	$ 873	N/A	$278	$298	$417	$238
1978/79										
October	$230	$248	$273							
November	236	245	268							
December	238	250	273							
January	242	252	284							
February	257	267	296							
March	263	274	307							
April	259	269	301							
May	259	263	300							
June	270	283	314							
July	270	275	320							
August	260	263	302							
September	250	259	296							
Average	$253	$262	$294	$467	$ 857	$220	$330	$307	$664	$319
1979/80										
October	$233	$240	$277							
November	231	234	279							
December	230	235	274							
January	235	229	264							
February	228	234	270							
March	218	223	260							
April	207	213	253							
May	212	221	260							
June	217	226	258							
July	248	265	300							
August	264	271	308							
September	279	289	331							
Average	$234	$240	$278	$451	$ 939	$197	$291	$303	$502	$337
1980/81										
October	$282	$296	$338	$483	$1,225	$229	$315	$319	$365	$365
November	301	320	363	604	1,225	238	353	363	414	415
December	287	293	324	816	2,300	240	384	323	422	410
January	287	275	319	N/A	2,300	242	346	319	433	393
February	276	269	298	N/A	2,325	236	332	299	411	359
March	279	269	310	N/A	2,175	236	328	299	392	353
April	273	284	317	N/A	2,156	246	337	315	385	366
May	269	277	308	N/A	2,010	260	342	304	389	372
June	263	261	290	N/A	1,888	251	330	294	382	351
July	263	267	294	N/A	1,600	251	317	302	367	339
August	246	250	287	718	1,448	246	316	280	363	331
September	228	234	270	631	1,260	231	289	275	350	318
Average	$271	$274	$310	$542	$1,843	$242	$332	$308	$389	$364
1981/82										
October	$222	[illegible]	$262	[illegible]	$1,099	[illegible]	$287	$293	$360	$348
November	221	[illegible]	254	[illegible]	991	[illegible]	309	300	364	367
December	220	[illegible]	252	597	984	236	310	308	351	354
January	225	231	258	617	949	233	321	313	347	336
February	219	226	253	N/A	965	234	326	305	345	334
March	220	225	254	N/A	920	234	316	291	333	315
April	224	230	265	N/A	923	260	329	301	338	331
May	232	235	268	N/A	857	256	325	305	335	326
June	225	225	252	N/A	801	245	293	286	336	297
July	220	222	248	N/A	784	222	264	264	320	280
August	198	204	234	N/A	765	209	252	263	282	278
September	194	193	225	549	757	194	248	282	279	280
Average	$218	$224	$252	$573	$ 900	$236	$298	$293	$333	$321
1982/83										
October	$186	$185	$212	$556	$ 799	$193	$244	N/A	$271	$266
November	196	202	231	556	875	194	248	260	286	264
December	201	203	232	562	850	197	252	252	296	263
January	204	206	234	586	838	183	250	242	305	257
February	208	209	237	N/A	805	181	235	239	315	259
March	214	214	230	N/A	831	183	240	235	334	247
April	223	227	252	N/A	836	197	257	N/A	395	249
May	222	224	251	N/A	835	208	259	N/A	434	251
June	217	217	243	N/A	840	205	257	N/A	472	247
July	225	226	260	N/A	850	217	264	N/A	537	253
Average	$210	$212	$239	$565	$ 836	[illegible]	$252	$284	$365	$256

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[1] U.S. farm prices.

[2] U.S. Chicago, No. 1, yellow.

[3] U.S., No. 2, yellow, CIF Rotterdam.

[4] U.S. Runners prices in shell basis.

[5] U.S. edible peanuts shelled basis, CIF.

[6] Farmers prices.

[7] [illegible], CIF, Rotterdam.

[illegible], US, CIF, Rotterdam.

[illegible]/Indonesia, [illegible], Rotterdam.

[illegible], No. 1, CIF, Rotterdam.

Source: [illegible]

Table 6

Vegetable Oil Prices

($/MT)

	Soybeans		Cottonseed		Sunflower Seed		Peanut		Palm	Rapeseed	Coconut	Linseed
	US[1]	ROTT[2]	US[3]	ROTT[4]	US[5]	ROTT[6]	US[7]	ROTT[8]	ROTT[9]	ROTT[10]	ROTT[11]	ROTT[12]
1974/75												
Average	$675	$616										
1975/76												
Average	$404	$418							$389		$381	
1976/77												
Average	$525	$570							$527		$585	
1977/78												
Average	$539	$581	$561	$630	$591	$618	$817	$1,007	$564	$580	$600	$401
1978/79												
October	$592	$604							$623		$ 848	
November	547	630							604		845	
December	569	651							604		882	
January	570	623							636		965	
February	615	649							694		984	
March	612	668							688		994	
April	591	666							666		1,079	
May	581	647							665		1,105	
June	608	671							675		1,087	
July	643	679							678		1,140	
August	648	683							652		1,025	
September	661	688							640		923	
Average	$603	$655	$697	$780	$725	$768	$798	$ 990	$652	$628	$ 970	$601
1979/80												
October	$605	$672										
November	613	682										
December	578	632										
January	520	597										
February	516	614										
March	486	605										
April	445	556										
May	458	536										
June	477	537										
July	578	618										
August	572	644										
September	576	621										
Average	$535	$609	$559	$683	$573	$634	$609	$ 782	$597	$582	$746	$679
1980/81												
October	$560	$597	$600	$646	$562	$634	$ 789	$ 916	$507	$544	$580	$677
November	588	639	613	703	595	718	1,074	1,084	585	594	650	775
December	522	574	591	675	604	720	1,082	1,180	622	575	610	807
January	506	545	558	680	598	690	1,052	1,131	625	518	614	733
February	485	516	534	658	562	650	866	1,121	640	491	603	673
March	508	535	538	630	571	650	752	1,116	620	503	574	671
April	516	531	602	654	595	652	750	1,101	588	515	552	655
May	476	511	589	683	613	669	818	1,181	599	487	563	688
June	471	513	586	701	626	692	838	1,175	640	481	570	704
July	505	530	615	699	617	685	840	1,154	600	475	585	685
August	458	506	542	628	604	643	952	1,184	531	466	565	644
September	427	485	456	633	581	588	888	996	509	470	535	595
Average	$502	$540	$569	$666	$594	$666	$ 892	$1,112	$589	$510	$583	$692
1981/82												
October	$433	$486	$452	$608	$499	$576	$761	$865	$513	$477	$564	$610
November	438	470	449	619	540	590	761	805	505	470	570	641
December	416	455	437	600	540	583	681	720	483	448	545	605
January	407	455	439	593	543	588	602	685	502	435	536	555
February	401	454	431	590	567	566	693	685	528	441	526	551
March	408	452	423	573	600	544	513	644	507	435	480	536
April	433	482	448	594	582	575	514	679	509	451	502	563
May	453	509	463	596	586	574	659	650	511	477	493	580
June	427	475	465	588	560	555	578	600	494	432	497	551
July	420	464	461	546	562	535	545	570	421	407	465	516
August	374	432	450	536	507	504	500	572	396	387	412	521
September	384	426	402	539	518	498	496	530	380	390	411	515
Average	$418	$463	$443	$582	$550	$558	$609	$667	$479	$438	$500	$562
1982/83												
October	$382	$416	$372	$495	$551	$475	$505	$470	$355	$390	$406	$456
November	386	403	370	498	551	471	554	471	362	381	416	455
December	367	399	362	495	551	458	575	466	376	383	429	417
January	362	397	358	490	551	454	564	461	372	386	435	420
February	380	395	392	493	551	429	566	452	367	390	451	398
March	390	394	402	515	551	421	532	445	378	396	482	385
April	426	434	471	599	551	452	554	495	419	402	576	400
May	435	434	516	621	535	464	582	548	432	427	622	419
June	428	425	476	620	485	472	588	593	394	404	694	446
July	478	460	527	660	529	484	675	607	414	412	805	445
Average	$403	$416	$425	$549	$541	$458	$570	$501	$387	$397	$532	$424

[1] Average wholesale, crude, tank, Decatur.

[2] Dutch, FOB ex-mill.

[3] Crude, tank cars, FOB Valley Points.

[4] US, PBSY, CIF Rotterdam.

[5] FOB Minneapolis.

[6] Any origin, ex-tank Rotterdam.

[7] Crude, tank cars, FOB SE mills.

[8] Any origin, CIF Rotterdam.

[9] Sumatra/Malaysia, CIF NW Europe.

[10] Dutch, FOB ex-mill.

[11] Philippines/Indonesia, CIF Rotterdam

[12] Brazil, No. 1 ex-tank Rotterdam.

Source: USDA

Table 7

Protein Meal Prices

($/MT)

	Soybeans		Cottonseed		Sunflower Seed		Peanut		Fish	Rapeseed	Copra	
	US[1]	ROTT[2]	US[3]	ROTT[4]	US[5]	ROTT[6]	US[7]	ROTT[8]	ROTT[9]	ROTT[10]	ROTT[11]	Corn Gluten[12]
1974/75												
Average	$134	$163										
1975/76												
Average	$162	$169										
1976/77												
Average	$219	$237										
1977/78												
Average	$181	$205	$140	$161	N/A	$150	$164	$203	$427	$163	$170	$148
1978/79												
October	$194	$224										
November	194	228										
December	209	235										
January	204	237										
February	211	239										
March	215	240										
April	210	239										
May	208	239										
June	231	256										
July	224	247										
August	208	232										
September	210	235										
Average	$210	$238	$165	$183	$93	$180	$199	$207	$386	$181	$206	$187
1979/80												
October	$201	$238										
November	201	251										
December	206	254										
January	200	248										
February	192	238										
March	180	226										
April	171	222										
May	183	225										
June	178	216										
July	210	242										
August	228	256										
September	259	292										
Average	$201	$242	$164	$202	$96	$186	$186	$224	$473	$159	$215	$199
1980/81												
October	$268	$308	$212	$238	$130	$209	$275	$275	$512	$207	$218	$205
November	287	335	230	249	138	237	290	299	568	228	224	220
December	246	289	224	248	118	229	N/A	300	557	228	217	217
January	243	283	206	253	105	236	N/A	277	541	242	220	207
February	233	268	179	246	94	221	230	269	518	221	210	185
March	229	266	185	232	117	200	213	263	491	217	198	188
April	244	276	207	229	113	199	210	259	501	218	194	185
May	245	266	201	225	123	204	N/A	259	504	204	190	176
June	221	245	190	204	99	196	N/A	248	485	183	181	163
July	226	246	183	192	90	200	198	231	470	161	180	152
August	221	241	183	196	190	207	N/A	220	439	174	182	162
September	209	239	167	202	107	206	N/A	220	434	177	184	172
Average	$239	$272	$197	$226	$111	$212	$236	$260	$502	$205	$200	$186
1981/82												
October	$199	$231	$150	$203	$ 99	$200	N/A	$212	$405	$185	$189	$175
November	198	228	151	205	106	195	$182	206	407	205	195	181
December	208	235	179	210	112	195	194	205	399	212	199	182
January	212	242	204	205	118	193	219	204	390	210	212	190
February	211	235	176	204	121	180	212	198	369	202	185	175
March	203	230	152	179	123	166	186	191	357	198	178	168
April	210	233	163	182	116	175	189	194	358	201	180	166
May	212	234	151	188	114	179	194	192	362	193	182	170
June	203	219	165	179	119	168	193	187	348	169	179	156
July	201	211	176	170	171	157	206	182	335	151	182	164
August	186	204	178	166	112	157	199	180	320	155	178	164
September	178	195	165	157	113	159	176	189	319	150	179	165
Average	$202	$225	$168	$187	$115	$177	$197	$195	$364	$186	$186	$172
1982/83												
October	$173	$192	$161	$153	$111	$150	$201	N/A	$326	$156	$178	$158
November	193	213	182	160	107	164	207	182	353	173	180	163
December	196	217	183	174	101	163	211	180	399	185	192	172
January	198	216	187	172	107	158	210	173	439	180	178	169
February	195	211	183	161	107	148	212	174	423	173	176	163
March	195	211	[illegible]	156	98	145	213	170	403	165	174	158
April	206	219	165	159	99	142	212	N/A	440	164	175	162
May	205	217	185	159	102	137	212	N/A	437	161	175	160
June	193	210	182	164	104	140	201	N/A	430	148	177	163
July	211	222	209	165	110	142	204	N/A	437	141	181	165
Average	$197	$213	$182	$162	$105	$149	$208	$176	$409	$165	$178	$163

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[1] Average wholesale, 44% Decatur.

[2] US, CIF Rotterdam.

[3] Cottonseed meal, 41% protein solvent, Memphis.

[4] Cottonseed meal, 38%, CIF Europe.

[5] Sunflower seed meal, 28%, protein, Minneapolis.

[6] Sunflower seed meal, CIF Rotterdam.

[7] Peanut meal, C.I.F. milled, 50% protein.

[8] Indian 40%, CIF Rotterdam.

[9] Fish meal, CIF, Hamburg.

[10] Rapeseed meal, 36%, CCB mill, Hamburg.

[11] Copra meal, Philippines, CIF Hamburg.

[12] Corn gluten, 23/24%, CIF.

Source: USDA

Table 8

Average Prices of Edible Peanuts (HPS) Shelled

	U.S. Runners CIF U.K.				
	1978	1979	1980	1981	
	($/MT)				¢/lb
January	904	840	940	2,300	104.33
February	890	829	965	2,325	104.46
March	875	825	957	2,175	98.66
April	875	843	948	2,156	97.81
May	879	865	unq.	2,210	100.24
June	879	865	unq.	1,888	85.64
July	878	895	945	1,600	72.58
August	875	885	945	1,448	65.68
September	872	867	1,085	1,260	57.15
October	860	867	1,225	1,099	49.85
November	860	875	1,225	991	44.96
December	853	867	2,300	984	44.62
Average	875	860	1,154	1,703	77.17

Source: USDA

Table 9

Processor Oil Price Without Discounts

($/barrel)

	Month	Price
1981	Jan	224
	Feb	224
	Mar	224
	Apr	224
	May	224
	Jun	225
	Jul	225
	Aug	225
	Sep	225
	Oct	225
	Nov	225
	Dec	225
1982	Jan	-
	Feb	-
	Mar	225
	Apr	225
	May	225
	Jun	225
	Jul	225
	Aug	225
	Sep	225
	Oct	225
	Nov	220
	Dec	220
1983	Jan	220
	Feb	220
	Mar	220
	Apr	220
	May	223.5
	Jun	227
	Jul	226
	Aug	225
	Sep	243
	Oct	293
	Nov	293

Source: Study Team

Table 10

Calculated Private-Sector Refining, Packaging, and Distribution Costs[1]

($/MT)

Processing Loss	22.00[2]
Direct Costs	112.19
Total Direct Costs	134.19[3]

[1]Based on 1981 data.

[2]Processing loss of 4 percent based on value of $550/MT for semi-refined oil.

[3]Does not include indirect (overhead) costs.

Table 11

Calculated SODEXOL Extraction and Refining Margins

($/MT Soybeans)

Year	Category	Margin
1981-82	Actual Operations	
	Realized margin on all operations	60.24
	Required margin to cover direct processing costs	68.18
	Required margin to cover direct and administrative costs	91.77
	Required margin to cover direct, administrative, and financial costs	124.70
	Required margin to cover all costs and minimum return on investment	147.63
1982-83	Price-Waterhouse Projections	
	Realized margin on all operations[1]	93.57
	Required margin to cover direct processing costs	57.50
	Required margin to cover direct and administrative costs	68.89
	Required margin to cover direct, administrative, and financial costs	85.71
	Required margin to cover all costs and minimum return on investment	103.48
1982-83	Realized Margins Calculated by Study Team[2]	
	Realized margin on all operations[3]	-
	Required margin to cover direct processing costs	64.54
	Required margin to cover direct and administrative costs	79.85
	Required margin to cover direct, administrative, and financial costs	107.91
	Required margin to cover all costs and minimum return on investment	131.79

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[1]It should be noted that SODEXOL did not meet the tonnage expectations of Price-Waterhouse of approximately 105,500 MT.

[2]Calculated by study team based on SODEXOL's imports of only 78,500 MT of soybeans rather than Price-Waterhouse's projected level of 105,500 MT.

[3]Impossible to calculate with available data.

Source: Price-Waterhouse
Study Team

Table 12

SODEXOL Cost Structure

1981-82

($/MT Soybeans)

Revenue	
0.175 MT semi-refined oil	172.91
0.800 MT soybean meal	158.83
Total revenue	331.74
Cost of soybeans	-271.50
Realized margin	60.24
All costs	-124.70
Profit or loss	- 64.46

Source: Price-Waterhouse
Study Team
Table 11, Appendix F

Table 13

SODEXOL Cost Structure

1981-82

($/MT Semi-Refined Oil Produced)

Revenue	
1 MT semi-refined oil	988.06
4.5714 MT soybean meal	907.61[1]
Total revenue	1,895.67
Cost of soybeans	-1,551.43[1]
Realized margin	344.24
All costs	-712.57
Profit or loss	-368.33

[1]Conversion factors: 1 MT of semi-refined oil requires 5.7143 MT of soybeans, which results in 4.5714 MT of soybean meal.

Source: Price-Waterhouse
Study Team
Table 11, Appendix F

Table 14

Margin Requirement

Imported Soybean Oil as Replacement for Soybeans

SODEXOL

Commodity	MT of Soybeans Replaced	Calculated Required Average Margin ($/MT Soybeans)[1]	Required Margin per MT of Crude Oil Imported ($)
Crude oil	5.405[2]	73.09	395.05
Semi-refined oil	5.714[3]	73.09	417.64

[1]Average required margin between 105,500 MT and 160,000 MT ($85.71/MT at 105,500 MT and $60.46/MT at 160,000 MT - required level to supply market with oil).

[2]Crude oil extraction at 18.5 percent.

[3]Semi-refined oil extraction at 17.5 percent.

Source: Study Team
Table 11, Appendix F

Table 15

Expected Cost Structure of SODEXOL
at Current Prices

December 1983

($/MT of Soybeans Processed)

Revenue	
0.175 MT semi-refined oil at $1,295/MT	226.63
0.800 MT soybean meal at $215.80/MT[1]	172.64
Total revenue	399.27
Cost of soybeans[2]	-334.22
Margin	65.05
Expected average cost per MT	-73.09
	-8.04

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[1]Based on CBOT January market close, December 7.

[2]Based on a conservative basis of $8.24 per bushel soybeans FOB Gulf port plus freight. Calculations made from CBOT January soybean market close, December 7 ($7.64) plus estimated basis ($0.60).

Source: Study Team
Table 11, Appendix F

Table 16

Government Duties on Imported Soybeans and Soybean Oil

Year	Commodity	Duty	
Up through 1982	Soybeans	N/A	
	Edible oil	Import tax	$ 60.40/MT
		Régie du Tabac	$ 21.60/MT
		Excise tax	$ 24.00/MT
			$106.00/MT[1]
1983	Soybeans	N/A	
	Edible oil	33 percent of CIF value[2]	

[1]The excise tax of $24 was removed in late 1982 and the $106.00 was reduced to $82.

[2]Quoted by the Embassy PL 480 office as 33 percent, quoted by SODEXOL as 34 percent plus $22 for the Régie du Tabac, quoted by private sector as 34 percent.

Source: Study Team

Appendix G

Conversion Factors

Conversion Factors

$1	=	Ø 5
1 kg	=	2.204 lb
1 lb	=	0.454 kg
1 MT	=	2,204 lb
1 short ton	=	2,000 lb
1 gal	=	3.8 liter
1 liter oil	=	1.89 lb
1 liter oil	=	858 g
1 gloss	=	0.10 liter
1 acre	=	0.4 ha
1 ha	=	2.5 acres
1 barrel oil	=	56 gal
5.466 barrels oil	=	1 MT
1 gal oil	=	7.2 lb

Appendix H

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