STRUCTURE AND PERFORMANCE OF THE EDIBLE VEGETABLE OILS AND FATS INDUSTRY IN KENYA

BY

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I hereby declare that this thesis is my original work and has not been presented for a degree in any other University.

JAMES MBURU THUO

This thesis has been submitted for examination with our approval as university supervisors.

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SUMMARY

The main objectives of this study were to determine (a) domestically produced raw materials and their procurement systems, (b) trend and level of edible vegetable oils and fats imports and exports and (c) the structure and performance of the processing industry and distribution chain.

A literature review indicated that very little work has been done on edible oils and fats marketing but some work has been done on the problem of domestic raw material production and marketing.

Primary data collection was done using three different questionnaires (namely, processing firms, wholesale and retail surveys) filled in by enumerators. The primary data was obtained on basis of simple random samples. Secondary data was gathered from various reports, statistical records and officials. Analysis of the data obtained involved calculations of per centages, frequency distributions, correlations and linear regressions.

Correlation and regression analysis showed that edible vegetable oils and fats import volume increased while oilseeds import volume declined during the period studied (1965-76). Most of the increase for the former import volume was accounted for by crude palm oil imports.

Edible vegetable oils and fats export volume also increased during the same period but in relatively small quantity compared with import volume.

The Kenyan Government has imposed import duties on oilseeds so as to protect domestic raw material producers and has also imposed a complete ban or specific import control on finished products in order to protect local processing firms from imports. In order to encourage domestic exports of finished products the Government provides export subsidies and duty refund.

Ecologically and agronomically Kenya is suited to oilseeds production. Nevertheless, the present production is much less than demand. Moreover, whether it would be an optimal strategy to expand oilseeds production depends on land availability and oilcrop enterprises competitiveness. At the 1976 prices it would be uneconomic to substitute palm oil imports by domestic production of oilseeds if such a move would be done at the expense of maize in terms of land used. However, in addition to hectarage expansion, domestic vegetable oils production can be increased through increased oilseeds yields per hectare, use of high oilcontent oilseeds obtained through plant breeding and selection, favourable financial support for oilseeds production and through competitive prices.

Marketing of oilseeds is mainly done by marketing Boards. Cottonseed is marketed by the cotton Lint and Seed marketing Board while sunflowerseed, sesame and groundnuts are mainly marketed through the Maize and Produce Board. Sesame and groundnuts are also marketed through co-operative societies. In Kilifi District Copra is marketed by the Kilifi Co-operatives Union while in Kwale District it is marketed through private traders, processors and processors' agents. All these involved in copra marketing must be licensed by the maize and Produce Board. Producer prices for most of oilseeds are determined by the Government.

An estimate of 1976 edible vegetable oils equivalent of domestically produced oilseeds was about 11,000 metric tons. This figure is an overestimate because it was derived under the assumption that all oilseeds were used for domestic oil extraction. On the other hand, the 1976 estimate for apparent domestic consumption of edible vegetable oils and fats was 28,753 metric tons. Most of this consumption is met through palm oil imports.

The edible oils and fats processing industry consists of the vegetable oils extracting sector (14 firms) and the fats processing sector. The former sector is characterised by relatively small firms which are quite inactive in sales promotion activities while the latter sector is quite active.

Except for the two fats processing firms which use imported palm oil as their major raw material, the edible vegetable oil extracting firms are mainly located in areas supplying raw materials. Edible oils extracting firms are not specialised in the use of raw materials but cottonseed, sunflowerseed and copra are commonly used.

Some processing firms have diversified their activities to varying degrees. However, the most common activity accompanying oils and fats processing is soap manufacture.

All edible oils and fats processing firms indicated that they were operating with excess physical capacity. However, information was not available regarding the economic capacity utilization situation. It might be expected though that the firms would be earning normal or super-normal profits overtime despite the low physical capacity utilization.

The vegetable oils and fats industry is characterised by lack of price competition and Governmental price control conceals price leadership. However, the large fats processing firm is a leader in non-price competition mainly in the form of advertisement and product brand proliferation.

Brand proliferation and vigorous advertising suggest absence of economies of size in the industry. Absence of economies of size was also suggested by a non-significant correlation between the maximum physical annual capacities and individual firm average processing costs.

Edible vegetable oils processors' margins vary with type of raw material used. Also, margins accruing to processors were found to be generally higher than those accruing to wholesalers. Furthermore, returns from oil-cake by-product should not be ignored when determining margins made by edible oil extracting firms.

Domestic market distribution of edible vegetable oils and fats is done mainly through wholesalers and retailers. However, large retail outlets like supermarkets and self-selection stores also buy some products direct from processors and thereby earn combined wholesale and retail margins. There are also private packers who buy oils and fats from processors and then package them using their own labels or brand names. These private packers distribute their products mainly direct to retailers.

Wholesalers were found to be general-line grocers and to consist of pure wholesalers and wholesaler-retailer categories. The wholesale and retail surveys showed that, in terms of stocking frequency, fats dominate the domestic edible oils and fats market, in contrast to oils, and that fats of one firm also dominate the market. The whole distribution system is characterised by a lack of vertical integration and only one fats processing firm has depots in the major distribution points.

There is Government price control which fixes maximum prices to be charged at all stages of the marketing chain and which includes transportation and handling costs. These prices are uniform throughout the country and, therefore, there are no spatial price differences.

It was observed that high quality edible vegetable oils are mainly found in super-markets and self-selection stores while low quality brands are commonly found in low income retail outlets. Also, small pack sizes were more popular than large ones in the low income ratail outlets.

A linear regression analysis indicated that the retail price of Kimbo was significantly influenced by the price of its raw material (palm oil) during the

1971-76 period. Another linear regression analysis showed that the observed retail prices for oils and fats rose during the period studied (1971-76). However, when the latter prices were deflated to constant shilling value, they were found to have declined, though non-significantly, during the same period.

CHAPTER 1

INTRODUCTION

1.1. Overall Problem

In Kenya, as in most other developing countries the per capita consumption levels of the essential commodities are generally low. The total consumption of edible oils and fats, which belong to the essential commodities group, is believed to increase as both the population and per capita income increase.

It follows, therefore, that increased population and per capita income result in increased demand for edible oils and fats and hence a heavier load is placed on the marketing system. Furthermore, the achievement of higher standards of living results in consumers demanding more services from the marketing system in terms of better quality products, better presentation methods, convenience in buying and changing consumer tastes. Therefore, a knowledge of the existing marketing system is vital if the necessary changes are to be effected in time to meet the additional demand made on its services.

Thus, one of the objectives of this study was to try to identify and describe the Kenyan edible vegetable oils and fats marketing system which, hitherto, has not been explored.

In addition, interest in the study was prompted by large imports of edible oils and fats. The common claim is made that Kenya has the potential to produce enough vegetable edible oils and fats to meet domestic demand. In 1976 the value of aggregate[1] edible oils and fats imports for home use[2] amounted to KShs. 179.6 million. Out of this, 77.5% (appendix 9) was accounted for by vegetable edible oils and fats, including oilseeds. As a consequence of this high expenditure on imports the Government has shown keen interest in the industry. This is evidenced by the industry's inclusion in the 1974/78 development plan and by the number of feasibility studies that have been conducted during the last five years. The studies, however, have been concerned with indentifying the possibility of growing oilseeds in Kenya. Particular attention has been paid to the agronomic, ecological and, to a lesser extent, economic aspects of various oilcrops.

As regards the marketing of edible oils and fats, little has been done. Some of the feasibility studies have looked at marketing briefly. Therefore, this study has aimed particularly at marketing aspects of vegetable edible oils and fats.

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1. See footnote 6 for definition.
2. See footnote 7 for definition.

An examination of the whole vegetable edible oils and fats industry would be too great an undertaking. Consequently, marketing aspects were only examined for Nairobi and Mombasa.

The Kenyan vegetable edible oils and fats industry consists of two distinct sectors. These are the edible oil processing sector and the hydrogenation sector (i.e. fats processing firms). The edible oil processing firms are involved in the extraction of oils from raw materials and then refinement in varying degrees. The fact that products are refined differently means that there are variations in qualities of products appearing on the market. The fats processing firms, on the other hand, have been commended for producing high quality products. These firms have also adopted modern marketing methods and have a well organised distribution system while the edible oils processing firms seem to be lagging.

The overall study of the vegetable edible oils and fats industry involved surveys of the processing firms, wholesale system and retail outlets. The industry was surveyed with a view to ascertaining the type of raw materials used, the system of procurement, the situation with regard to raw material supply and the type of products produced.

The surveys of the wholesale and retail systems were carried out to determine the form of distribution channels involved in vegetable edible oils and fats. marketing and to examine the wholesalers' and retailers' relationships with the processors.

In order to augment the information obtained from the processors and to ascertain the reasons for the shortage in supply of domestically produced raw materials, Government officials, especially agricultural officers, were contacted.[1]

1.2. General Aspects of Vegetable Oils and Fats.

1.2.1 Extensive interchangeability

The end-uses of vegetable oils and fats are many and varied. Their demand can come from food, soap and synthetic detergent industries, paint manufacture varnishes, lubricants and other industrial products. Each oil has its own special characteristics and none is equally well suited for all purposes, although improved processing methods have made the different oils largely and increasingly interchangeable (2). Both technical and economic factors influence interchangeability. A very large number of individual fats and oils are substitutable since the characteristics of different kinds can be altered by processing (5).

Nevertheless, three broad groups of oils can be distinguished on the basis of their uses and the first and second groups are relevant to this study. The three broad groups are (5):

a) The 'Edible' group - 'soft' oils;

b) The 'Edible - industrial' group - 'hard' oils; an

c) The 'industrial' group -'drying' or technical oils.

The edible group principally comprises groundnuts, soya-beans, cottonseed, rapeseed, sesame and olive oils. These are mainly used for cooking. The edible - industrial group (or hard oils) consists of such oils as palm, palm kernel and coconut oils which are used both for margarine manufacture and other specialised food uses as well as in the production of soap, chemicals, and synthetic detergents. The industrial group (or technical oils) are chiefly used as drying agents and lubricants and consist mainly of linseed, tung and castor oils (2).

The most important vegetable oils for the manufacture of margarine are palm, coconut, groundnut, soyabean, cottonseed, sunflower and rapeseed oils. The chief vegetable oil constituents of the compound cooking fats are cottonseed, soyabean, groundnut and palm oils which are also used in their liquid form for cooking purposes. In the manufacture of margarine and shortenings all the soft oils, lauric oils, hard oils and lard are substitutable to a very large degree (5).

Locally produced oils and fats usually have a privileged position as a result of economic policies, lower transport costs for local products and the influence o user habits and preferences formed over a long period of time (5). The chief economic influences on interchangeability, apart from consumer preferences, are the availability of different kinds of fats and oils and (where substitution is technically not too difficulty) their relative prices.

The relevance of interchangeability to the Kenyan situation is quite clear. The wide range of substitutability of oils means that Kenya (with its production of coconuts, cottonseeds, sunflowerseeds, rapeseed, groundnuts and sesameseeds) can satisfy all her requirements of oils and fats if enough raw materials can be produced domestically. Those oils which cannot be produced locally, such as palm oil, could be substituted by those listed above. However, the situation of deficit supply of domestically produced raw materials has led to the adoption by the Government of various policies connected with the external trade of edible oils and fats. For instance, duty free importation of crude palm oil (due to its relatively low price), imposition of duties on various other raw materials, and complete ban on imports of margarines and vegetable ghee are examples of such policies.

1.2.2 Diversity of forms of competition

The wide technical scope for interchangeability, as stipulated above, results in diversity of commercial competition in the international oils and fats markets. This competition can be classified in several ways but four of these, as shown below, are relevant to this study:

a) competition between imported and domestic supplies;
b) competition between manufactured forms of oils and fats;
c) competition from supplies of by-products; and
d) competition between natural fats and synthetics.

Nearly all countries of the world produce some kinds of oilseeds and/or fats. However, there are deficit areas where domestic production has to be supplemented with supplies offered, often at lower prices, on world markets by exporting countries. In order to provide protection to their primary producers, countries resort to price support schemes, quotas, tariffs, taxes and so on. These actions, ultimately, influence demand for imported oilseeds, oils and fats and, in turn, the prices and export earnings of exporting countries (5). The Kenyan policy of import duties on edible oils and fats and their raw materials, except for palm oil which is relatively cheap, is an application of the above named protection tools.

Kenyan domestic production of raw materials is insufficient for her needs and the Government has, therefore, adopted the policy of protecting both the primary producer and the manufacturers. Protection is conducted through import duties or complete prohibition of imports of finished products like margarine and vegetable ghees.

Competition between manufactured forms of edible oils and fats is exemplified by that between margarine and butter. There is direct price competition between the two products. Policies affecting dairy output, trade and prices influence the demand for raw materials used in margarine manufacture. And, in turn, these same policies affect prices and export earnings of oilseeds products in general.

There is competition between natural fats and synthetics. Soap is made from natural fats while synthetic detergents are largely made from petroleum derivatives. The implication is that where competition for domestic supplies of oils exists between soap manufacture and food uses, greater use of detergents would free the oils for domestic food uses or, when relatively expensive, for export.

For fats and oils as a whole demand is generally price inelastic (5). Corresponding income elasticity of demand is low in high income countries but highly elastic in most developing countries. There is a wide range of supply elasticities for the different kinds of oils and fats, due to their diverse origins (5).

1.2.3 Hydrogenation of oils and fats

Hydrogenation involves the process of adding hydrogen to unsaturated bonds. In this way properties of the oils and fats are altered. Hydrogenation improves keeping qualities of oils and fats and increases the resistance of semi-drying oils to degradation. It also results in all unsaturated fatty substances competing with naturally solid or semi-solid oils and fats in the manufacture of margarine and with edible fat of saturated fatty acids for industrial purposes.

Thus, hydrogenation or oil hardening is a process used in manufacturing margarine, cooking or compound fats or ghee. In theory any vegetable oil can be used in vegetable fat production through partial and selective hydrogenation of its unsaturated components, thereby increasing its melting point. However, economic considerations make it necessary to use the cheapest raw materials.

Therefore, raw material price considerations are important in selection of product blends. In Kenya palm oil, which is particularly cheap, is often used as a basic constituent (14).

1.2.4 Some definitions

Edible oils can be used as (1) salad oils (sunflower-seed, olive, maize germ, soyabean oils, etc) or as (ii) cooking oils (cottonseed, rapeseed, safflower, etc). However, there is no clear distinction between the two types, except that in addition to both being refined, bleached and deodorized, salad oils are also "winterized" in cold countries.

- Winterizing is an operation carried out at the end of processing, which is practised in cold countries and whose purpose is to give a stable product that remains clear upon storage. The process involves slow cooling of the oil followed by filtration.
- Deodorization involves the removal of the volatile components by steam injection and high vacuum accompanied by high temperatures. In the case of compound fats deodorization is conducted after hydrogenation.
- Bleaching is a purification process which mainly involves removal of colouring materials. It is usually done by means of a process called 'batch process' which involves application of various reagents and controlled temperatures. Sometimes citric acid is added to improve the colour and the keeping properties of the finished products (14).

- Margarine is only different from cooking fats or shortenings in that it is a stabilized emulsion which incorporates small quantities of water, milk fat and special additives such as vitamins, salt and flavouring agents (14).

CHAPTER 2

LITERATURE REVIEW

Literature concerning marketing of edible oils and fats in Kenya is virtually non-existent. No studies have been directed to the edible oils marketing system. Nevertheless, literature concerned with oilseeds production and marketing has been accumulating, especially during the last five years (since 1972). The available literature is in the form of feasibility study and technical reports related to agronomic aspects. The feasibility study reports have concentrated on examining the possibilities of increasing domestic production of oilseeds, the agronomic and ecological aspects of oil crops and the situation of processing firms.

In 'A National Cash Crops Policy for Kenya' (9) there is a section which deals with the question of oilcrops production. Oilcrops were categorised into various groups and sub-groups, out of which three were found to be relevant. In group A(iii) were placed such crops as soyabeans, linseed, sunflower, cashewnuts, coconuts, cotton and groundnuts. The group comprised those crops which appeared capable of being grown and marketed in substantially greater quantities and on which effort was to be concentrated.

The other relevant group was A(V). This group was made up of crops which had been investigated and had been discarded, or which may have been neglected for one reason or another. Either they could not grow or could not produce economic yields. One of the crops included in the group was Safflower. Group B(iii) was made up of crops which had a definite increased export potential and sesame was one of them. Soya beans were indicated to be an alternative to maize in many parts of Kenya and were recommended for large farms. Sunflower was said to have done well in many parts of Kenya, particularly Western Kenya, but prices were not attractive.

In an occasional paper by Diana (3) attention was paid to the vegetable oil crushing industry with the emphasis being placed on raw material availability and procurement problems. The study covered the whole of East Africa but the Kenyan situation was only looked at in comparison with the other two partner states. The study revealed that Kenya was very much dependent on the partner states with regard to supply of raw materials (especially cottonseed). The conclusion was that Kenya was doing 'poorly'. Processing firms were said have been working at low capacities.

A report by the United Nations Industrial Development Organisation (UNIDO) edited by Garzon-Trula (10) was comprehensive and extensive. Its distribution is restricted and, therefore, only general aspects of it are mentioned here. This report examined the edible oils and fats external trade, the impact of external trade on foreign exchage, the domestic raw material production possibilities and problems, the processing firms efficiency and, finally, it briefly looked at the marketing system.

According to the report the main factor leading to edible oils shortage was the low oilcontent of the available oilseeds. It added that Kenya can produce high oilcontent seeds of sufficient quantity and acceptable quality. The brief look at the marketing of edible oils and fats led to the conclusion that margins made by manufacturers, particularly the edible fats processing firms, were likely to be high.

A report by the Commonwealth Development Corporation (C.D.C.) on "Oilcrops in Kenya" (15) focused its attention on agronomic and ecological aspects of oilcrops production. Existing production of oilcrops was examined closely, including the regions where particular oilcrops are widely grown.

The C.D.C. report also examined the performance of oilcrops both under experimental and field conditions. It was found that differences between performances under experimental and field conditions were extremely large for all oilcrops. The various crops examined were sunflower, cotton, groundnuts, soyabeans, sesame and rapeseed. In addition to examining performances of these crops, the report dealt with climatic requirements, varietal problems, ripening and harvesting problems and other relevant cultural aspects.

The most recent report (12) came out in March 1977. It is a report by a commission which was charged with the duty of appraising and advising the Government on accelerated oilseed production and utilization in Kenya. This report is more or less a continuation of previous ones. The previous reports had concentrated on examining whether the country had the potential to produce enough oilseeds but this report was concerned with how the production and utilization of oilseeds could be accelerated. The survey started with an examination of the present production and then went on to assess the schemes which could help to increase production. Various recommendations were made regarding the kind of research that needs to be conducted, the necessary changes in prices so that oilcrops could become competitive, and how quality, especially of copra, could be improved.

As in the case of UNIDO report, it was indicated that there was 'a need for production of high oil content sunflowerseed in place of the low oil content seed being grown in some areas'. In trying to increase production of raw materials, efforts would have to be concentrated on cotton, coconuts, sunflower, groundnuts, rape and sesame.

The report also suggested that the best way to achieve expansion of local oilseeds production would be through an Oilseeds Board.

Other literature that contains information on oilseeds is in the form of reports by various research stations and Ministry of Agriculture Annual Reports. These reports contain information on trials and other activities that have been conducted in connection with particular oilcrops.

As can be observed from the above literature review, a lot of information has been compiled regarding production and marketing of oilseeds but information on the marketing of edible oils and fats is minimal. Thus, attention in the literature has so far been focused only on the problem of raw material supply.

CHAPTER 3

OBJECTIVES OF THE STUDY AND HYPOTHESIS TO BE TESTED

3.1 Objectives of the Study

The objectives of the study were related to four aspects of the edible oils and fats industry. These were raw material supply and procurement, edible oils and fats imports and export, processing firms and their activities, and finally, channels involved in the distribution of edible vegetable oils and fats. Thus, the objectives of the study were:

3.1.1 To determine structure of raw material supply and procurement, the types of raw material produced domestically and the relationship between processing plants location and sources of raw materials.

3.1.2 To determine the trend and level of edible oils and fats imports and exports.

3.1.3 To determine the structure and performance of the processing firms.

3.1.4 To determine the structure of the distribution system.

3.2 Hypotheses.

The following hypotheses will be tested to answer strictly counterpart questions[13].

3.2.1 Kenya has the potential to produce economically enough edible vegetable oils and fats to meet domestic demand.

The claim made is that Kenya has got the potential. Nevertheless, the country is heavily dependent on import of both the finished products and raw materials. This means that, if the claim is true, there must be some underlying constraints which have hindered the exploitation of this potential.

3.2.2 The edible vegetable oils and fats processing plants are located in areas acting as sources of domestic raw materials.

The assumption made here is that raw materials are bulky and contain a fairly large proportion ending up as waste and/or by-product after processing. Therefore, by locating plants in raw material supply areas transportation costs can be lower than otherwise.

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13. The counterpart questions refer to questions deriving directly from the hypotheses. For example, the counterpart question to hypothesis 3.2.1 is 'Does Kenya have the potential to produce economically enough edible vegetable oils and fats raw materials to meet domestic demand?'

3.2.3 There is a high degree of backward, but no forward, vertical integration conducted by processing firms.

This hypothesis emanated from the assumption that there is raw material shortage and that the domestic supply of edible oils and fats is less than demand. Consequently, processing firms might be expected to participate in farm production of oilseeds either on their own farms or by contracting with farmers in an attempt to secure more raw materials. On the other hand, the deficit supply of edible oils and fats in the domestic market would render it unnecessary for processing firms to extend their activities to the wholesale and retail levels.

3.2.4 The volume of edible vegetable oils and fats imports has been increasing steadily over time

The assumption is that while domestic demand for edible oils and fats has been rising fast, domestic production has been increasing only slowly. Therefore, increasing quantities have to be imported to meet the increased demand.

3.2.5 Margins accruing to edible vegetable oils processors are higher, generally, than those accruing to wholesalers.

It is assumed that price control, which fixes the maximum prices to be charged at all levels of edible oils and fats marketing, is more effective at the wholesale and retail levels than at processors levels.

3.2.6 The per unit (kg) retail price of edible vegetable oils and fats decreases as pack size increases.

The thinking behind this hypothesis is that there are economies realized for increasing package size and sales discounts are usually given on large pack sizes. Thus, as size increases, decreasing packaging costs are incurred per unit of product as well as sales discounts being provided.

3.2.7 Low income consumers prefer small edible fats pack sizes.

In addition to having income constraints, low income consumers normally lack proper storage facilities and this favours purchases of small quantities of those products which deteriorate quickly. On the other hand, high income consumers have storage facilities and, therefore, they are able to avoid spoilage. They can buy less frequently and in larger quantities.

CHAPTER 4

METHODOLOGY

4.1 Data Collection Method

Data collection was aimed at obtaining

(a) Secondary data and information from relevant records and reports; and

(b) Primary data and information from surveys of processing firms, wholesalers and retailers.

4.1.1 Secondary data collection

Collection of secondary data involved the use of various reports and statistical records, and discussions with officials. Secondary data was found to be deficient in that there were no figures for domestic consumption of edible oils and fats and quantities of domestically produced and marketed oilseeds.

4.1.2 Primary data collection method

4.1.2.1 Processing industry survey.

The first available list of vegetable edible oils and fats processing firms contained eleven of them. The initial plan was to survey all of them. However, it was learnt during the survey period that another five processing plants also existed.

Three of these plants are located in Lamu Distict and one is located near the Kenya-Uganda border. Long distances and financial and time constraints ruled out surveying these same four plants. Of the twelve remaining, two failed to respond and therefore only ten processing plants were surveyed finally.

In conducting the surveys, personal interviews were applied using a structured questionnaire (Appendix 17).

Various problems were encountered during the survey which affected adversely the quality and quantity of data collected. For instance, delayed and unkept appointments resulted in waste of time, and in some cases no response at all.
Furthermore, refusal on the part of nearly all firms to disclose certain types of data, e.g. output and sales volumes and processing costs, severely affected the analysis which could be performed subsequently.

4.1.2.2 Wholesale and retail surveys

The term wholesaler is used here to mean an individual or a business engaged in grocery wholesaling which includes edible oils and fats among the items handled. Wholesale surveys were conducted in Mombasa and Nairobi and a retail survey was conducted in Nairobi only.

In Mombasa, the Trade Licensing Section of the Mombasa Municipal Council undertook to provide a list of grocers. There was no separate grocers' list immediately available and, therefore, it had to be compiled. The list when provided proved incomplete - only showing 181 grocers and it did not differentiate wholesalers from retailers. Thus, separate populations for wholesalers and retailers were not available for Mombasa.

All the 181 grocers were located along 55 roads. To reduce the amount of travelling, a simple random sample of 20 roads was taken by numbering the roads 01 to 55 and using random digits tables. Despite the fact that a sample of only 10 wholesalers was sought, a sample of 20 roads was taken because it was anticipated that some roads would have no wholesalers while others would have only a few. And, in addition the proportion of wholesalers to retailers was not known.

To avoid bias in choosing the wholesale grocers to be interviewed, systematic sampling was applied. Interviews had to be conducted from the Eastern or Southern side (whichever was applicable) of the road starting with the first followed by every third wholesale grocer on both sides. This method was applied under the assumption that there was no possibility of periodic occurence of any special feature of wholesale grocers. Also roads were given weight according to the number of wholesale grocers because the more of them a road had the more of them were interviewed

A sample of 10 wholesalers, which obviously seems small for a town like Mombasa, was taken for two main reasons. The first reason was the limitation imposed by both finance and time. Secondly the sample was considered acceptable because the Kenyan edible vegetable oils and fats industry was regarded as having little diversity with respect to products handled and the procurement and distribution methods employed. Thus, it was felt that even a small sample would be representative.

In Nairobi a fairly complete list of 1847 grocers was obtained from the Nairobi City Council Trade Licensing Section. As in the case of Mombasa, there was no differentiation between wholesale and retail grocers and, therefore, actual populations of each category were not known. The total sample taken was 45 grocers of whom 10 were wholesalers and 35 were retailers. Since neither the populations nor the proportions of the wholesalers or retailers were known, it was decided to select a relatively large preliminary sample of grocers. This would ensure that enough wholesalers could be interviewed, since their proportion was believed to be smaller than that of retailers. Hence, a preliminary simple random sample of 100 grocers was drawn using random sample digit tables. To arrive at this preliminary sample size the following assumptions were mad

- For every 10 grocers there was at least one wholesaler.

- All grocers traded in edible vegetable oils and fats. Interviews were conducted according to the position of a grocer in the preliminary sample list. The interviews were conducted according to this list until 35 retailers and 10 wholesalers were interviewed.

In general, sampling response was satisfactory in the sense that not very many grocers refused to answer questions. For instance, in Mombasa 12 wholesalers were contacted of whom 2 refused to respond. In Nairobi 3 wholesalers refused to respond while only one retailer refused. However, responses to specific questions were often poor where quantitative information was concerned. It was very difficult to get information on turnover, and quantities and proportions of various fats and oils handled.

In summary, the samples of wholesalers and retailers which were selected are held to permit reasonable generalization of associated measures of variables to strictly defined parent populations through the assumption of approximately random selection and representativeness. While the small samples constitute a drawback in making statistical inference they nevertheless reflect necessary priorities and constraints in the field arising from restricted time and funding.

4.1.2.3 Problems encountered during the surveys

As alluded to previously various setbacks were encountered during the survey period as a result of which deficiencies occured in the industry, wholesaler and retailer sample data. Consequently the initially intended analysis became restricted because of lack of the necessary quantitative data. For example, processing firms withheld information on proportions of various raw materials used, output quantities, sales volumes and processing costs. Output and sales volume figures are vital in the determination of market shares and processing costs are needed to show whether plant size has any effect on efficiency in terms of per unit processing costs incurred.

4.2 Analytical Methods

To facilitate use of computer analysis qualitative and quantitative answers in the surveys were recorded on punch cards. In the case of qualitative information, this procedure necessitated devising suitable summary codes.

In the analysis of collected survey data statistical methods were used. Calculations of means, distribution frequencies, percentages, simple correlations and linear regression coefficients were made.

Secondary data was subjected to similar analysis involving correlations and linear regression models. The secondary data used was mainly of a time series nature consisting of retail prices, external trade volumes and values of edible oils and fats. Analysis concentrated on determining trends and variable interrelationships.

With the computer programme available at the University of Nairobi Computing Centre, correlation coefficients could only be calculated by replacing missing values with means data - a procedure handled by the programme itself. Since the survey data undergoing correlation analysis contained missing values, the method would seem to be biased towards showing lack of correlation when, infact there was correlation in the population, and not the reverse situation. The correlations based on the processing industry wholesale and retail data are, therefore, influenced by the missing data method and must be interpreted in the light of such shortcomings. It should be stressed here that no computer programme existed which would select only complete paired data observations for correlated variables from the data deck. Hence, it was necessary to accept the method described using missing data substitution. The alternative would have meant pulling cards with complete data for each correlation which would have prolonged the research unresonably for the extra refinement in results (bearing in mind the direction of bias).

CHAPTER 5

EDIBLE OILS AND FATS IMPORT, EXPORT AND TRANSFER TRADE

5.1 Trend and Level of External Trade[4], Transfers[5] and Aggregate[6] External Trade.

Analysis of aggregate external trade on an individual item basis for edible oils and fats would be too involved for the present study. For that reason the trade is examined in aggregate rather than by item, except where items deserve special treatment due to their importance. The import data used in this study refers to imports for home use[7].

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4. External trade (imports or exports), according to the East African Community, refers to trade with countries other than the three partner states.

5. Trade between the East African Community member states involving domestically produced commodities is referred to as transfer.

6. Aggregate external trade (imports or exports) is used for the purpose of this study to refer to the sum total of both external trade and transfers.

7. "Imports for home use mean imported goods which on importation are cleared directly through customs plus (i) goods released by customs from bonded warehouse, (ii) goods entered into bonded manufacturing plants less nationalised re-exports, that is, re-exports of goods originally cleared for home use but subsequently exported to places outside East Africa but not reported." (Source: E.A.C. Annual Trade Report).

5.1.1 External trade and transfers - descriptive analysis

The items included in the data are those constituting the trade in edible oils and fats. Non-edible oils such as castorseed oil and acid oils have been excluded from the data. The levels and trends of trade in edible oils and fats are shown in appendixes 9 and 10 and figures 5.1, 5.2, 5.3, and 5.4.

Appendix 9 contains trade data by value while appendix 10 contains trade data by volume. The data plotted in figures 5.1, 5.2 and 5.3 is contained in the two appendixes mentioned here. The figures mentioned above are semi-logarithmic scale graphs showing the levels and rates of change of trade. Semi-logarithmic graphs were used mainly for two reasons. First, they compress data on a graph and give clearer display. Second, they give per centage change information. Although the latter is not discussed, the graphs provide ready reference.

Figure 5.1 shows the trend of trade by value. Between 1965 and 1969 aggregate imports and the net aggregate imports by value were slightly declining. After 1969, the trend assumed an upward tendency. However, the trend of aggregate edible vegetable oils and fats by value exhibits a generally upward movement for the period under consideration notwithstanding annual fluctuations.

Figure 5.1: Aggregate external trade in edible oils and fats by value.

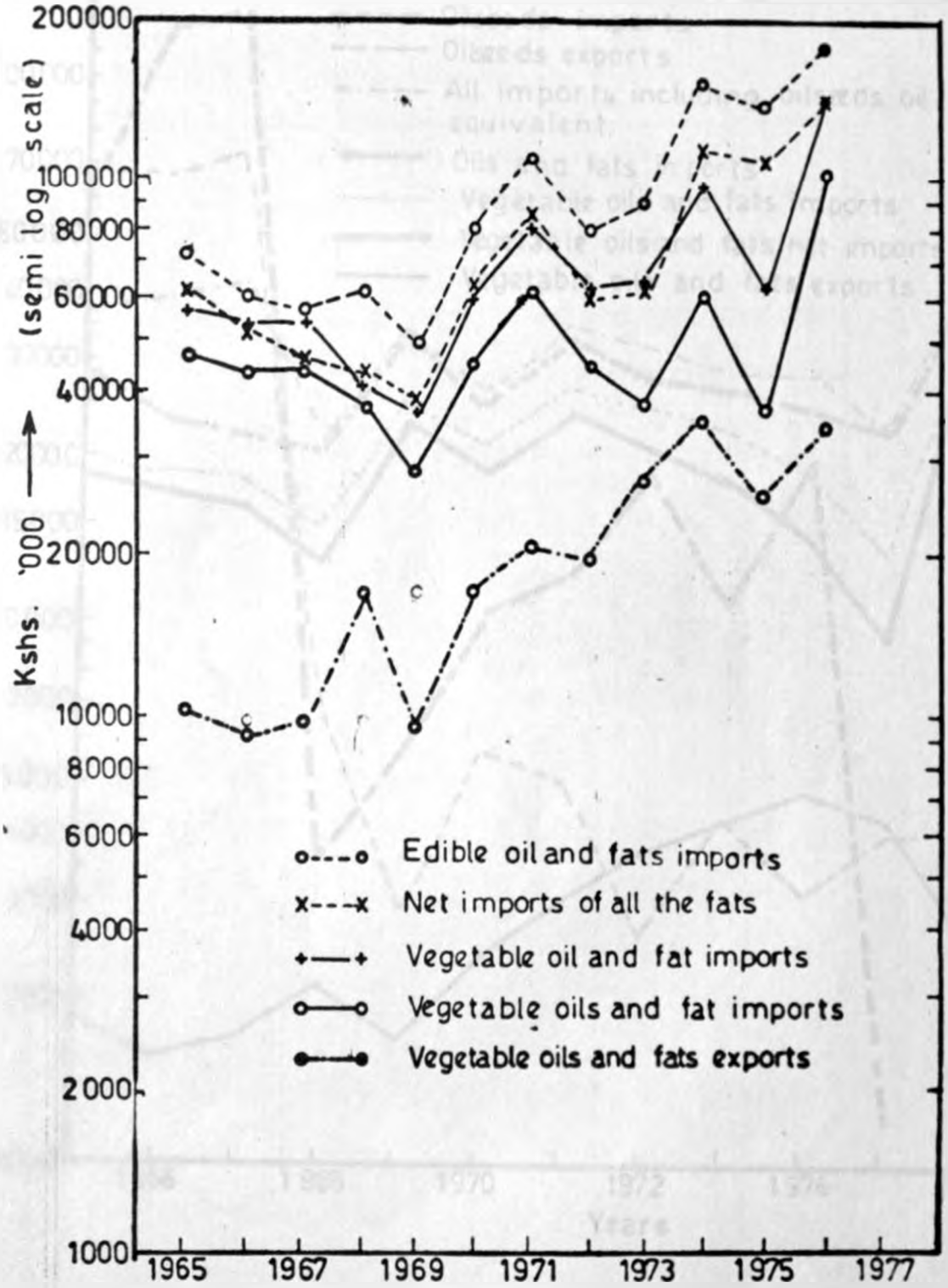


Figure 5·2 : Aggregate external trade in edible oils and fats by volume.

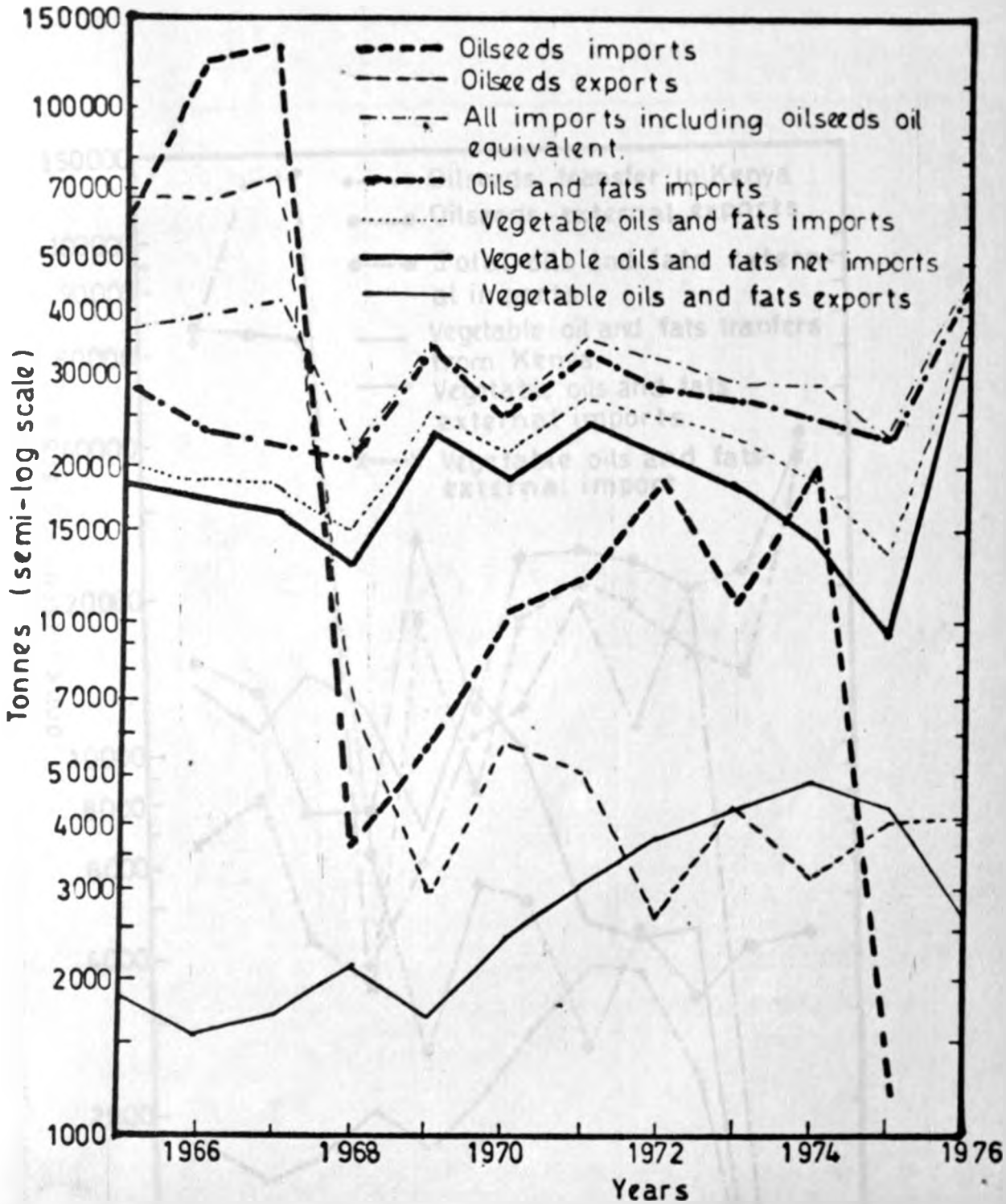


Figure 5.3: External trade and transfers

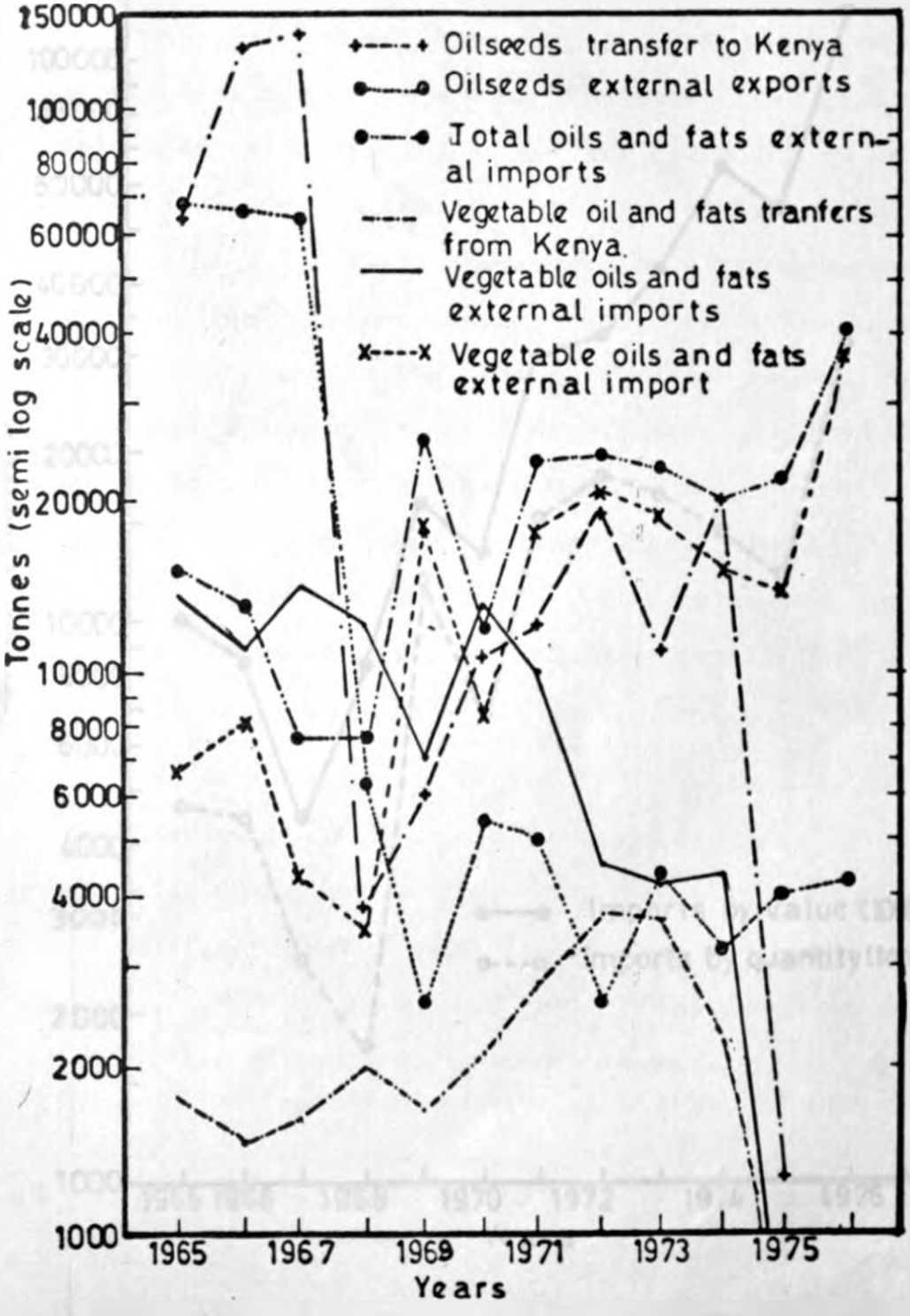
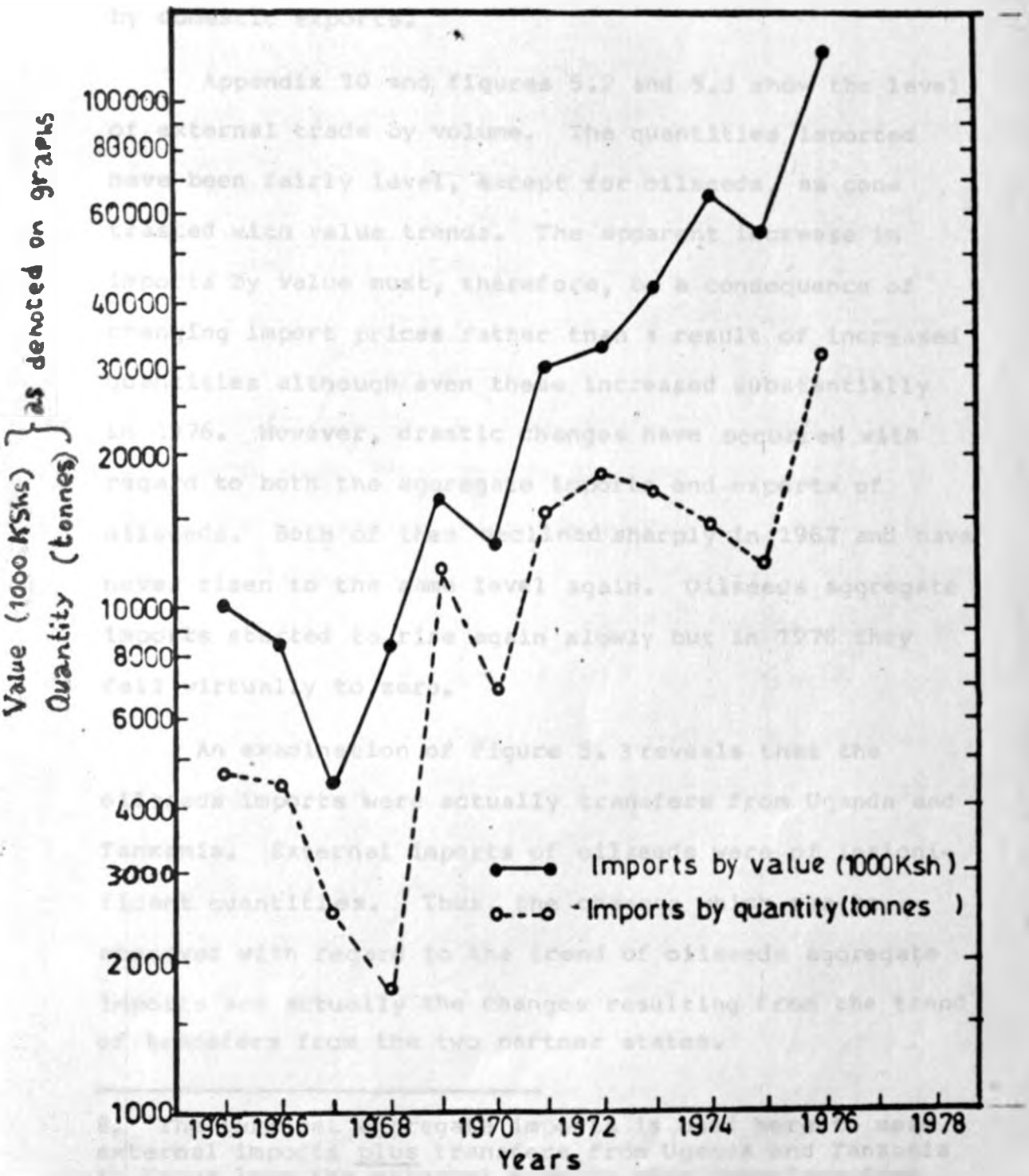


Figure 5·4 : Palm oil imports — Semi-log graphs



The similarity in trends shown by aggregate imports and the net aggregate[8] imports by value indicates that net imports are influenced largely by imports rather than by domestic exports.

Appendix 10 and figures 5.2 and 5.3 show the level of external trade by volume. The quantities imported have been fairly level, except for oilseeds, as contrasted with value trends. The apparent increase in imports by value must, therefore, be a consequence of changing import prices rather than a result of increased quantities although even these increased substantially in 1976. However, drastic changes have occurred with regard to both the aggregate imports and exports of oilseeds. Both of them declined sharply in 1967 and have never risen to the same level again. Oilseeds aggregate imports started to rise again slowly but in 1976 they fell virtually to zero.

An examination of figure 5.3 reveals that the oilseeds imports were actually transfers from Uganda and Tanzania. External imports of oilseeds were of insignificant quantities. Thus, the changes which can be observed with regard to the trend of oilseeds aggregate imports are actually the changes resulting from the trend of transfers from the two partner states.

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8. The term net aggregate imports is used here to mean external imports plus transfers from Uganda and Tanzania to Kenya less the external exports plus transfers from Kenya to Uganda and Tanzania.

Figure 5.3 shows that the trend in Kenya's oilseeds exports has depended mainly on quantities dispatched to other countries rather than to the partner states. On the whole Kenyan oilseeds exports have been steadily declining. The sharp rise of edible oils and fats imports in 1976, following the drastic fall in oilseeds imports in 1975, indicates that Kenya does not produce enough edible oils and fats raw material. Hence, a decline in oilseeds imports had to be compensated by an increase in edible oils imports. It must be realized, however, that there is a complete ban on imports of finished edible oils and fats products. Therefore, the rise in aggregate edible oils and fats imports has been due, mainly, to increased importation of crude palm oil. This is clearly shown in table 5.1 and figure 5.4. Table 5.1 shows that the proportion of edible oils and fats accounted for by palm oil has been increasing.

As can be observed from Appendix 9 and figure 5.1, Kenya has been a net importer of edible oils and fats. Net imports have been positive throughout the 1965-76 period and have been high. Kenyan aggregate exports of edible oils and fats consists mainly of vegetable edible oils and fats. There has been a steady rise in the value of edible oils and fats exports. However, figure 5.2 shows that there has been a decline in the exports by volume of aggregate vegetable edible oils and fats.

TABLE 5.1: PALM OIL AND AGGREGATE EDIBLE OILS AND FATS IMPORTS (Metric tons) 1965 - 76

Year	Aggregate of all oils and fats imports	aggregate of vegetable oils and fats imports	palm oil and palm kernel oil imports	3 as per cent of 1	3 as per cent of 2
	1	2	3	4	5
1965	28,997	20,422	4749	16.4%	23.2%
1966	24,279	19.319	4505	18.5	23.3
1967	22,250	18,485	2549	11.5	13.8
1968	21,098	15,473	1784	8.5	11.5
1969	34,297	25,775	12147	35.4	47.1
1970	25,340	21,651	6951	27.4	32.1
1971	33,468	27,477	15499	46.3	56.4
1972	28,985	25,164	18877	65.1	75.0
1973	27,204	23,004	17082	62.8	74.0
1974	25,084	19,567	14759	58.8	75.4
1975	22,765	13,608	12733	55.9	93.6
1976	41,789	36,740	34171	81.8	93.0

1. For definition of terms see footnotes 4 to 8.

SOURCE: Derived from appendixes 4 and 5.

There has also been a continuous decline in oilseeds exports. The implication would be that, if domestic production of oilseeds has not been declining, then most of it has been used by the local processing firms. Lack of domestic oilseeds production data hinders verification of this implication. Unless there has been a substantial increase in the domestic production of oilseeds during the period studied the domestic oil extracting industry must be experiencing a serious raw material shortage due to the virtual disappearance of oilseeds imports since 1974.

Although the UNIDO report (10) attributes the problem of raw material shortage to import duties levied on oilseeds it seems as if there have been other important factors at work. External imports of oilseeds, which are affected by the duties, were never of significant quantities even before these duties were imposed. Most of the oilseeds imports have been transfers from Uganda and Tanzania and import duties were not applied to trade between the East African Community states. Thus, the major decline was a result of decline of transfers from Uganda and Tanzania and this can't be explained in terms of import duties. The cause of the aggregate oilseeds imports decline is mainly a consequence of political differences amongst the E.A.C. states, political and Economic disorders in one of the states and the recent non-functioning of the community.

5.1.2. External trade statistical analysis

Eleven external trade data variables were subjected to quantitative analysis which involved calculation of simple correlation and linear regression coefficients. Table 5.2. shows the eleven variables analysed as well as the computer output for the simple correlation matrix.

(a) Correlations analysis

The simple correlation coefficients indicate that four variables were significantly correlated with aggregate edible vegetable oils and fats imports at 0.05 level of significance and 10 degrees of freedom. The variables were the aggregate of all edible oils and fats imports (r=0.947), the net aggregate of all edible oils and fats (r=0.932), the net aggregate of vegetable oils and fats excluding oilseeds (r=0.983) and the value of aggregate vegetable oils and fats imports (r=0.643). All four correlations are somewhat obvious bearing in mind the fact that aggregate vegetable oils and fats account for a very high proportion of all edible oils and fats imports, as can be seen from appendix 10. Thus, a large part of the variation in the four variables was a consequence of variation in the aggregate vegetable edible oils and fats imports.

However, the correlation (r=0.643) between the value and volume of vegetable oils and fats imports is only just above the rejection level (0.576) and no doubt suggests that volume of imports is not the only major influence on the value of vegetable edible oils and fats imports.

TABLE 5.2: EXTERNAL TRADE[1] SIMPLE CORRELATION MATRIX

(1965 - 1976 ANNUAL DATA)

Variable	Q_1	Q_2	Q_3	Q_4	Q_5	Q_6	Q_7	V_1	V_2	V_3	T (Year)
Q_1 = aggregate edible vegetable oils and fats imports	1.00										
Q_2 = aggregate of all edible oils and fats imports	•• 0.947	1.00									
Q_3 = aggregate of all edible oils and fats imports including oil-seeds oil equivalent	0.513	0.469	1.00								
Q_4 = aggregate edible vegetable oils and fats exports	-0.070	-0.084	-0.530	1.00							
Q_5 = net aggregate import of all edible oils and fats excluding oilseeds	•• 0.932	0.983	0.560	-0.267	1.00						

...../2.

TABLE 5.2: CONTINUED

Q_6 = net aggregate import of vegetable oils and fats excluding oilseeds	0.983**	0.935**	0.595**	-0.252	0.954**	1.00					
Q_7 = Net aggregate import of oilseeds	-0.233	-0.385	0.540	-0.313	-0.306	0.169	1.00				
V_1 = Value of all edible oils and fats imports incl. oilseeds	0.399	0.424	-0.075	0.600**	0.300	0.276	-0.372	1.00			
V_2 = Value of aggregate vegetable edible oils and fats imports	0.643**	0.583**	0.169	0.361	0.503	0.557	-0.269	0.963**	1.00		
V_3 = Value of aggregate vegetable edible oils and fats exports	0.309	0.280	-0.311	0.777	0.130	0.156	-0.426	0.914**	0.820**	1.00	
Time (years)	0.365	0.355	-0.318	0.780**	0.196	0.210	-0.437	0.842**	0.689**	0.908**	1.00

1. For definitions of terms used see footnotes 4 to 8.

** Correlation coefficient (r) is significant at the 0.05 L.O.S. with 10 d.f. (Ho:ρ = 0).

SOURCE: Based on external trade data shown in appendixes 9 and 10.

The other factor is undoubtedly price. The correlations between the aggregate vegetable edible oils and fats imports and both the aggregate edible vegetable oils and fats exports and the net aggregate imports of oilseeds were very low and negative. The only implication here then, is that for the period studied a rise or fall of each of the two variables is accompanied by opposite movement in aggregate imports of vegetable oils and fats.

The correlations involving the aggregate of all edible oils and fats imports are virtually the same as those explained above involving aggregate edible vegetable oils and fats imports. The reason is that the variation of the former is virtually a reflection of the variation in the latter, as explained earlier.

The only correlation coefficients found to be statistically significant in relation to aggregate edible vegetable oils and fats exports, as observed in table 5.2, were those dealing with value and time (in years), at the 0.05 level of significance and 10 degrees of freedom. The correlation (r=0.777) between the volume and value of the aggregate edible oils and fats exports may suggest that quantity exported depends mainly on export market price and not on domestic over-supply.

Such a view tends to be in agreement with the Kenyan policy of encouraging exports, especially when the export market offers better prices. The correlation coefficient (r=0.780) for the aggregate edible oils and fats exports and time in years shows that exports have generally been rising during the period under consideration.

The correlation coefficients for the net aggregate oilseeds imports and the other variables are all negative except in one case. They are all non-significient at the 0.05 level but two of them are still worth noting. These are the correlations between the net aggregate oilseeds imports and the volume of aggregate imports of all edible oils and fats, and time in years. The implications are that net oilseeds aggregate imports show some tendency to rise when the volume of aggregate imports of all oils and fats rises and vice-versa, and that oilseeds net imports showed a tendency to fall during the period considered.

(b) Regression analysis

In addition to performing simple correlation analysis, linear regression models were formulated and regression coefficients calculated. Using the notations in table 5.2, six linear regression models were formulated as follows:

5.1 $Q_1 = a_1 + b_1T + e$

5.2 $Q_3 = a_2 + b_2T + e$

5.3 $Q_3 = a_3 + b_3Q_4 - b_4V_1 + e$

5.4 $Q_4 = a_4 + b_5V_3 - b_6T + e$

5.5 $Q_6 = a_5 + b_7Q_1 + b_8T + e$

5.6 $Q_7 = a_6 - b_aT + e$

Where e = error term.

The assumptions which led to the formulation of these regression models were the following:

Model 5.1: The volume of the aggregate edible vegetable oils and fats imports is positively related to time in years, 1965 is taken as time T_o. The model was intended to show the trend of aggregate edible vegetable oils and fats imports.

Model 5.2: The volume of aggregate imports of all edible oils and fats, including oilseeds oil equivalent, has been increasing with time, that is, volume is positively related to time.

Model 5.3: The aggregate imports of all edible oils and fats is related to the volume of aggregate edible vegetable oils and fats exports and the value of all edible oils and fats imports. It was thought that, since domestic production is claimed to be less than demand, the import volume would increase with volume of export

and that the volume of imports would decrease with increases in value of imports.

Model 5.4: The volume of aggregate vegetable edible oils and fats export is positively related to export value and negatively related to time. That is, volume moved together with price and it has been declining over time.

Model 5.5: The net aggregate import of vegetable oils and fats imports, excluding oilseeds, is positively related to aggregate edible vegetable oils and fats imports and negatively related to time.

Model 5.6: The net aggregate import of oilseeds has been decreasing. The assumption is that aggregate oilseeds imports have fallen as a result of increased domestic oilseeds production.

The resulting coefficients are shown in table 5.3, together with values of R^2. The values of R^2 indicate the goodness of fit by showing the proportion of the total variation that is accounted for by the regression. The value of R^2 is obtained by using

$$R^2 = \frac{\Sigma (\hat{Y}_i - \bar{Y})^2}{\Sigma (Y_i - \bar{Y})^2} = \frac{\text{variation in Y explained by X(s)}}{\text{total variation in Y.}}$$

TABLE 5.3: EXTERNAL AGGREGATE TRADE REGRESSION COEFFICIENTS

Estimated form of regression equation	a_i	b_i	R^2	partial corr. coeff. (r).
5.1. $Q_1 = a_1 + b_1T + e$	18,193.48	$b_1 = 620.03$	0.133	0.36
5.2. $Q_3 = a_2 - b_2T + e$	37,210.30	$b_2 = -634.60$	0.101	-0.32
5.3. $Q_3 = a_3 - b_3Q_4 + b_4V_1 + e$	40,352.57	$b_3 = -4.68^{**}$ $b_4 = 0.07$	0.372	-0.61^{**} 0.36
5.4. $Q_4 = a_4 + b_5V_3 + b_6T + e$	1,046.22	$b_5 = 0.05$ $b_6 = 136.59$	0.635	0.26 0.28
5.5. $Q_6 = a_5 + b_7Q_1 - b_8T + e$	-2,652,15	$b_7 = 1.08^{**}$ $b_8 = 299.8^{**}$	0.992	0.99^{**} -0.87^{**}
5.6. $Q_7 = a_6 - b_9T + e$	33,081.53	$b_9 = -2907.63$	0.191	-0.44

** = b_1 significant at the 0.05 L.O.S. and with the corresponding d.f. ($H_0: \beta = 0$).

** = r_1 Significant at the 0.05 L.O.S. and with the corresponding d.f. ($H_0: \rho = 0$).

The results of model 5.1 suggest that the volume of aggregate edible oils and fats have shown no clear tendency to increase. Both the regression and partial correlation coefficients were non-significant at the 0.05 level of significance and with 10 d.f. Also the value of R^2 was found to be very low (0.133 or 13.3%).

Results of model 5.2 suggest that the volume of aggregate imports of all edible oils and fats, including oilseeds oil equivalent, has shown no clear tendency to decrease, and certainly not increase as assumed. The value of R^2 was found to be very low (0.101 or 10.1%). The regression and partial correlation coefficients were non-significant at the 0.05 L.O.S and with 10 d.f. Import figure decline has mainly been caused by decline in oilseeds imports.

Results of model 5.3 show that the volume of all edible oils and fats imports was negatively and significantly related to the volume of edible vegetable oils and fats exports. The volume was, however, non-significantly related to the value of all edible oils and fats imports at the 0.05 L.O.S and with 9 d.f. The value of R^2 for the estimated regression equation was 0.372 or 37.2% and it shows that the regression accounts for a low proportion of the total variation in the dependent variable.

In model 5.4 the regression and correlation coefficients were non-significant at the 0.05 L.O.S and with 9 d.f.

Results of model 5.5 show that net aggregate vegetable edible oils and fats imports were related positively to aggregate edible vegetable oils and fats imports. The partial correlation coefficient for these variables was 0.99. The net aggregate import of vegetable edible oils and fats (excluding oilseeds) declined during the period under study. The value of R^2 (0.992 or 99.2%) was very high showing that the regression accounts for most of the variation in the net aggregate imports of vegetable edible oils and fats.

In model 5.6 the regression and partial correlation coefficients were non-significant at the 0.05 L.O.S. and with 10 d.f.

5.2 Kenyan Government Policy for External Trade

The Kenya Government has formulated market policies that are directed specifically to the edible oils and fats industry. In general, the Government discourages imports of finished products which can be produced domestically. Whether the importation of raw material is to be allowed or discouraged depends on its local availability, its prices and its substitutability with locally available raw materials.

5.2.1 Policy for raw materials external trade

The main objective, among others, of the Government's policy for vegetable edible oils and fats raw materials is to protect the domestic raw material producer from imports and thereby encourage domestic production. To achieve this objective the Government has imposed import duties on most of the edible oils and fats raw materials. Some raw materials such as crude palm oil, used in the processing of cooking fats and margarines, are allowed to be imported duty free.

Others have import duties (generally 10%) imposed on them or face specific control through licensing or a quota system in which the Central Bank of Kenya regulates the available foreign exchange for imports. In general, the raw materials are either duty free or have low import duties.

The reason for variation in policies towards different raw material imports is the existance of conflicting objectives. The two main objectives are the need to protect and encourage domestic raw material production and the need to ensure sufficient raw material supply to the domestic processing firms in the face of domestic supply deficit. —

Usually, a raw material is allowed to be imported duty free when its price is low, as is the case with palm oil. Where importation is feasible, firms generally import directly without making use of middlemen.

The Government's policy concerning the export of oilseeds is also faced with two conflicting goals. Export of edible oils and fats raw materials ought to be discouraged so that local processing firms can use them. On the other hand, there is need to earn foreign exchange through exports.

Consequently, oilseeds exports are neither prohibited nor encouraged. Whether oilseeds export takes place or not depends largely on the relationship between domestic and export prices. If export prices are relatively higher than domestic prices then export takes place.

5.2.2 Policy for edible oils and fats in final form

The three main Governmental objectives with regard to external trade in edible oils and fats are:

(a) to protect domestic oils and fats processing firms from imports competition;

(b) to encourage domestic production of edible oils and fats to self-sufficiency level; and

(c) where possible, to earn foreign exchange through exports.[1]

In its endeavour to protect the local processing firms, the Government has adopted the 'young industry protection theory'. Imports of finished edible oils and fats items, such as margarine, ghee and butter are completely banned while imports of other animal and vegetable oils and fats are subject to specific import licensing or control on quota basis. The aim is to protect the local firms. Importation of such products should only be allowed when:

(i) local firms cannot supply enough to meet domestic demand;

(ii) price of the local product is too high;

(iii) the local product is of poor quality.

Methods to be applied in achieving self-sufficiency in edible oils and fats have not been clearly defined so far. Lack of clearly defined policy could be a consequence of the domestic shortage of raw material supply which has led to the exemption of palm oil imports from import duty charges. As can be seen from figure 5.4 and appendixes 5 and 7, the palm and palm kernel oil imports have been continually increasing both in value and volume. This seems to suggest that at present self-sufficiency is not easily forthcoming. A lot of effort will have to be exerted before the domestic production of raw materials can reach the self-sufficient level in the long-run.

In order to encourage edible oils and fats finished products exports, the Government uses such incentives as export subsidy and duty refund. The duty refund entails paying back to the processor the customs duty (equivalent of exports) paid for the raw material imports. Export subsidy refers to a 10% export compensation payment to which an exporter is entitled to enable him to

lower his export price and thereby become competitive in the export market. The export subsidy can be applied separately or, where applicable, together with the duty refund.

The effects of the duty refund and export subsidy cannot be assessed here but a few issues can be raised. The domestic edible oils and fats processors claim that they are working with a lot of excess capacity. The consequence is increased production costs per unit of output. Processors would, therefore, be expected to take any possible steps to lower the costs. One of the steps could be increased importation of raw materials with the aim of exporting some of the final products and lowering per unit processing costs. This would mean a high margin in the domestic market at the existing price due to reduced per unit processing costs and also securing and establishing an export market.

The failure of the domestic processing firms to take advantage of the above incentives could be for several reasons. One, the domestic prices of edible oils and fats are so high relative to export prices that the processors don't feel inclined to explore export markets. Two, the quality of the products produced by most of these firms is low and, therefore,

doesn't meet export market requirements. Three, the oilseeds import prices are generally higher than the domestic ones and therefore, the processing firms prefer to use the little domestic raw material that is available. However, these are general observations and there is no data available to support or refute them.

CHAPTER 6

DOMESTIC PRODUCTION OF VEGETABLE EDIBLE OILS AND FATS RAW MATERIALS

The literature review presented in Chapter 2 of this study has clearly shown that a fair amount of information has been gathered in recent years about the possibilities of expanding domestic production of oilseeds. The information has been in the form of survey reports and feasibility study reports. The reports contain information on climatic requirements of various oilcrops, type of research that needs to be done on various oilcrops so as to improve their oilcontent and information on other cultural problems and practices that may need to be looked into.

The discussion which follows attempts to underline some important issues concerning the domestic production of vegetable oils and fats raw materials. Since no survey information was obtained in support of these observations, they rely heavily on the data and views gathered from Agricultural officers in the various districts and provinces visited.

6.1 Position and Importance of Oilseeds in the National Economy

The contribution of oilseeds to the national economy has been and still is relatively small.

Indeed, until very recently, oilseeds had not received much attention in the Government's policy. The Commonwealth Development Corporation report stated that "Oilseeds do not figure largely in the Ministry of Agriculture's development proposals, which for the current period are still in draft form." (15, p.2).

Table 6.1 shows the contribution of oilseeds to gross marketed agricultural production by value. The highest per cent contribution during the period considered was in 1970 when it was 1.0 per cent of the total crops gross marketed production and 0.65 per cent of the total gross marketed agricultural production.

The edible oils and fats industry has, of late, aroused interest and the Government is very anxious to improve it. To meet the demand for the needed raw materials the Government has been conducting or initiating feasibility studies to examine the possibilities of expanding domestic production of oilseeds. Even some of the processing firms have embarked on the promotion of oilseeds production by providing farmers with inputs such as seeds, fertilizers and land preparation services. In other words, these processors have on occassion entered into contracts with farmers for receiving oilseeds.

TABLE 6.1: VALUE OF GROSS MARKETED AGRICULTURAL PRODUCTION

K£'000

ITEM \ YEAR	1970	1971	1972	1973	1974•	1975
Castor and other oilseeds	556	400	272	235	497	600
Total Crops	58,498	56,905	70,392	86,832	109,607	113,393
Oilseeds as % of total crops •••	1.0	0.7	0.4	0.3	0.4(5)	0.5
Total marketed production	85,396	86,695	105,931	123,303	146,664	150,001
Oilseeds as percent of marketed production •••	0.6(5)	0.5	0.3	0.2	0.3	0.4

• Provisional

•• Forecast based on data available for the first two quarters of 1975

••• Own calculations

SOURCE: Statistical Abstract of Kenya (p.107) - 1976.

6.2 Present Situation of Domestic Oilseeds Production

There was a consensus among all the vegetable edible oils and fats processing firms interviewed that their major problem was the shortage of domestic raw materials. This shortage was made worse by restriction of oilseeds imports. Discussions with agricultural officers in various districts revealed that there were various constraints hindering domestic oilseeds production and expansion. The important constraints were thought to differ from region to region and were identified as socio-economic values of the people concerned, the pricing system and enterprise competition, and the discriminatory financing between oilcrops and other competing crops.

6.2.1 Socio-economic constraints

In some regions of the country agricultural production is influenced by factors other than purely economic ones. In areas where cash cropping has not really caught on, priority is given to subsistence production of food crops irrespective of their economic disadvantage relative to non-food crops. For instance, in some districts in the Coast Province farmers prefer to grow maize rather than cotton, sesame and sunflower, even though maize does not perform as well in this region as oilcrops would.

Labour requirements also play a role in facilitating or hindering the growing of particular crops. Farmers in the Coast Province, especially in Kwale District, prefer to grow perennial crops such as cassava, coconut palms, and cashewnuts rather than annual crops which have higher labour requirements. It should be realized that the problem cited arises not as a consequence of actual labour shortage, but from a general reluctance to engage in enterprises that require more labour inputs.

Another problem arises from the provision of incentives. It has been observed that when farmers in Kilifi District (Coast Province) are provided with free services and inputs, they sometimes take advantage of these without putting in extra effort required to make full use of them. For example, the Cotton Lint and seed Marketing Board has undertaken a programme aimed at improving cotton production. Therefore, the Board provides farmers with free cottonseed and pesticides. Since cotton is a crop that requires proper cultural practices and is very susceptible to pests, it is important that it is not interplanted with other crops. Nevertheless, after getting the cottonseed, farmers prefer to interplant it with maize rather than plough more land.

The reason seems to be that farmers are reluctant to increase total labour input and prefer to use less total labour on smaller acreages. The consequence of interplanting and failure to apply pesticides as recommended leads to very low cotton yields. But with free cottonseed and pesticides farmers usually do not feel the loss because they still harvest their maize and the cotton crop presents something of a bonus in relation to the low costs incurred.

6.2.2 Oilseeds prices

In areas where farmers are motivated economically in decision making, prices play an important role. In order to show the effect of prices on oilseeds production, consideration is given to maize and sunflower as produced in Nakuru District.

Table 6.2 shows gross margins under current prices and also indicates prices at which maize and sunflower crops are equally remunerative other things remaining constant. These two crops normally compete for the same land. It can be seen that the production costs of both maize and sunflower are not very different. At the current (1976) prices maize has an advantage over sunflower as far as gross margins per hectare are concerned. Thus, the present prices favour maize rather than sunflower.

TABLE 6.2: MAIZE AND SUNFLOWERSEED PRICE RELATIONSHIP - 19

CROP		Yield kg/Ha)	Price (Shs/ bag)•	Gross Output (Shs/Ha)	Costs (Shs/ Ha)	Gross Margin (Shs/Ha/ Year)
Sunflower[1]		1500	50/-	1875/-	1585/-	290/-
Maize[1]		3150	80/-	2800/-	1690/-	1110/-
Equally remunerative Maize and sunflower seed Prices[2]	Sunflower	1500	72/-	2700/-	1585/-	1115/-
	Maize	3150	80/-	2800/-	1690/-	1110/-
	Sunflower	1500	50/-	1875/-	1585/-	290/-
	Maize	3150	56.60	1981/-	1690/-	291/-

• Weights are 40 kg per bag of sunflowerseed and 90 kg per bag of maize.

SOURCES: 1. Nakuru District Agricultural Office

2. Own calculations.

The price at which the two crops can be equally competitive (table 6.2) are such that, assuming yields and production costs remain the same, the price of sunflowerseed would have to rise from K.Shs.50 per 40 kg bag to K.Shs. 72. Or, conversely, the price of maize would have to fall to K.Shs.56.60 per 90 kg bag. In fact, a price of K.Shs. 72 per 40 kg bag of sunflowerseed is the same as the price paid to farmers by processors (in 1976) of K.Shs.1.80 per kg .

However, a comparison between wheat and rapeseed (for Nakuru District) shows that a higher gross margin does not necessarily make a crop acceptable to farmers. The gross margins per hectare were K.Shs.384 and K.Shs.1119 for wheat and rapeseed respectively. Although these two crops compete for the same land in Nakuru District, farmers generally still prefered to grow wheat.

6.2.3 Financial policies

The problem of discriminatory financing arises from the existence of support policies directed towards some crops and not to others. Some crops like maize and wheat are considered to be essential and as such they qualify for governmental support policy known as Guaranteed Minimum Returns (G.M.R.). Under the policy farmers get short term production credit and are guaranteed a minimum return in case of crop failure.

This security reduces farmers' uncertainty. Thus, it is not surprising to see farmers growing crops with lower gross margins (like wheat) and failing to grow crops with higher margins (such as rapeseed). Uncertainty in the growing of rapeseed is intensified by the fact that its price is not controlled, and consequently farmers are not sure what the prices will be in the next season.

6.2.4 Input supplies and other problems

Ocassionally supply of inputs has been a constraint hindering expansion and improvement in oilcrop production. The most cited example is lack of supply, late supply or uncertified and low quality supply of planting seeds. When farmers fail to get certified seeds, they use any seeds that are available. This normally leads to poor germination and low yields. As a result, farmers get discouraged. This has been a common problem with regard to groundnut seeds in Nyanza Province.

In addition, there sometimes occur insufficient supplies of other inputs such as fertilizers and spray chemicals. Also ploughing may be delayed by contracts Delayed payments as well as poor oilseeds purchasing organization also tend to discourage farmers.

Oilcrops are generally considered to be less demanding than other types of crops, with the exception of cotton which requires good management. The major problem faced in sunflowerseed production is crop loss from birds. It is a serious drawback in small scale production where the percentage loss can be quite high.

6.3 Production Expansion Possibilities

Oilseeds production data in terms of quantity is seriously lacking. The data presented in table 6.3 is taken from a recent report (12) and shows production in terms of hectarage and estimates of edible oils production over a five year period (1972-76).

The yields applied are low but realistic in that they reflect the existing state of domestic oilseeds production. The estimates of edible oils production indicate the quantities which could be obtained if all the oilseeds were used domestically for oil extraction. Speaking generally, edible vegetable oils and fats production in Kenya can be increased either by improved yields per hectare or through some improvement in oil-content. The latter applies especially to sunflowerseed. However, not much improvement in estimates from increased oilcontent of seeds can be expected because extraction rates assumed are already fairly high.

TABLE 6.3: OILSEEDS PRODUCTION - 1972 - 76.

CROP	Yield/ha Kg.	Extraction rate (%)	1972	1973	1974	1975	1976
			HECTARES				
Sunflower	500	35	5,440	4,670	9,310	12,970	27,760
Cotton	250 (Seed cotton)	13	68,360	66,650	81,630	77,380	76,590
Groundnuts	600	38	19,820	14,000	13,550	11,630	9,470
Sesame	250	45	5,360	4,000	4,820	5,420	5,500
Rape	800	35	300	410	1,140	400	500
Coconuts	500 (copra)	58	N/A	N/A	N/A	N/A	21,280**
			Estimated Edible Oil Production Based on the Above Data (metric tons)				
Sunflower			952	817	1,629	2,269	4,858
Cotton			1466	1426	1,750	1,659	1,642
Groundnuts			4518	3192	3,089	2,651	2,159
Sesame			603	450	542	609	618
Rape			84	114	319	112	140
Coconuts			-	-	-	-	1,500
		TOTAL	7,623	5,999	7,329	7,300	10,917

* In compiling the annual hectarages it was necessary to interpolate figures that were unavailable in the statistics.

** Estimate

SOURCE: (12)

Increased oilseed production is also possible through hectarage expansion, particularly in high potential areas where land is not yet too much of a constraint. However, little information exists to indicate whether such expansion is likely to take place.

Using the estimated 1976 production of edible vegetable oils in table 6.3 as a base, future production of edible oils can be estimated under assumptions concerning hectarage and yield expansion possibilites.

Present oilcrop yields are extremely low and it is generally thought that they can be doubled or increased threefold. For instance, sunflowerseed yields can be increased from 500 to 1500 - 1800 kg/ha, seedcotton yields can be increased from 250 to over 1000 kg/ha and groundnuts yields can also be increased considerably (15).

The 1976 edible vegetable oils domestic production estimate of 10,917 metric tons (table 6.3) was used as a base to determine the rate of growth of edible vegetable oils production that would lead to self-sufficiency. Appendix 15 shows that in 1976 domestic apperent consumption of edible vegetable oils and fats was about 28,753 metric tons. In order to estimate the required rate of growth that would lead to self-sufficienty in 5 and 10 year periods, a 3.8 percent (4) rate of growth of

domestic consumption per annum was used. Thus, for a 5 year period, the necessary rate of growth (r) per annum for self-sufficieincy is given by:

$$28{,}753\ (1.038)^5 = 10{,}917\ (1 + r)^5$$

$$r = 26.0\% \text{ per annum.}$$

Such a high rate of growth is not likely to be achieved and indicates that self-sufficiency cannot be obtained in 5 years. Similarly for a 10 year period, the necessary rate of growth is given by:

$$28{,}753\ (1.038)^{10} = 10{,}917\ (1 + r)^{10}$$

$$r = 14.4\% \text{ p.a.}$$

This rate of growth for edible oils production is also high and , therefore, suggests that self-sufficiency is not likely to be obtained in less than 10 years.

6.4 Palm Oil Import Substitution

In the following section the possibility of substituting imported crude palm oil by domestic production of vegetable oils is examined using the current prices (1976) and yields of sunflowerseed and maize. Comparison is made on the basis of quantity of vegetable oil produced per hectare.

Taking a 35 per cent oilcontent and a yield of 1500 kg/ha, the sunflowerseed oil that can be produced per hectare is 0.525 metric tons.

The sunflowerseed equivalent of this quantity of oil costs the processor KShs.1875 (at the 1976 prices). During the same year (1976) the average palm oil import price was KShs.3763 per metric ton (see appendixes 1 and 5). Thus, 0.525 metric tons of palm oils was worth KShs.1975 and these results indicate that substitution of imported palm oil by domestically produced sunflowerseed oil would be economic. However, the results do not show the effect of the substitution on the economy as a whole.

At present maize seems to be the best alternative enterprise, at least in areas where it competes with sunflower for land. Maize is highly competitive in high potential areas because of its favourable prices, relative to other crops, and because of its greatly improved yields through breeding and proper cultural practices. Thus, the effect of displacing maize production by expanding sunflowerseed production is assessed by comparing the former with palm oil imports in terms of costs.

To facilitate comparison between palm oil and maize, a sunflowerseed price[9] (maize equivalent - table 6.2)

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9. Sunflowerseed price equivalent of maize was used because no oil extraction rate for maize was available and also because maize is grown for other purposes rather than for oil extraction. Sunflowerseed price equivalent of maize refers to the price at which the two crops would be equally competitive.

of KShs.1800 per metric ton was used so as to equate sunflowerseed revenue (also cost to processor) per hectare with that of maize. Therefore, 0.525 metric tons of sunflowerseed oil at a price of sunflowerseed equivalent of maize, would cost the processor KShs.2700 with the cost of palm oil remaining at KShs.1975. The result indicates that it would be uneconomic to substitute maize for palm oil imports under the 1976 price conditions. This means that, if price of sunflowerseed (or price of other oilseed) is raised to a level at which sunflower and maize crops are equally remunerative, substituting palm oil by domestically produced sunflowerseed oil (or other vegetable oil) would lead to higher raw material costs to processors. It also means that under the 1976 prices farmers would find it uneconomic to expand sunflowerseed production at the expense of maize.

6.5 Domestic Oilseeds Marketing System

6.5.1 Cottonseed marketing

Seedcotton Marketing is the responsibility of the Cotton Lint and Seed Marketing Board. Cotton ginners buy seedcotton for the Board. There are eleven cotton ginneries in Kenya at present. Eight of them are owned by private business, two are owned by the Board and one is owned by a co-operative society.

Those ginneries that are owned by the Board purchase and process seedcotton on behalf of the Board. Private ginners act as the Board's agents and are paid commissions.

Seedcotton price is determined by the Ministry of Agriculture in consultation with the Board. However, cottonseed is regarded as a by-product of cotton lint and, therefore, its price is not controlled by the Government. The Board determines cottonseed prices with reference to its own accounts and world market prices.

At present sales of cottonseed are conducted through auctions which are held at the Board's headquarters (Nairobi). During the auctions, grades and sources of cottonseed are specified. There are in fact only two grades of cottonseed. Grade AR cottonseed corresponds to grade AR seedcotton (while lint) and grade BR cottonseed corresponds to grade BR seedcotton (stained or yellowish lint).

Observations made in the present study indicate that some shortcomings exist in the marketing of seedcotton, especially in Nyanza Province and Kilifi District. These shortcomings are delayed payments to farmers, failure of transport to turn up when expected for seedcotton collection and insufficient storage capacity in

some areas. Improvements in these matters are crucial to the improvement and encouragement of cotton growing.

6.5.2 Sunflowerseed and other oilseeds marketing

Sunflowerseed marketing has undergone some major changes recently. Previously, sunflowerseed marketing was done solely by the Maize and Produce Board directly or by the Kenya Farmers Association acting on its behalf. Of late, however, processors have been allowed to purchase sunflowerseed direct from farmers, particularly in the large scale farming areas. Nevertheless, the Board still remains the main buyer and buyer of the last resort.

In the small scale farming areas the major functions of the Board in Sunflowerseed marketing are to act as an assembler and to protect farmers from exploitation by private traders or processors. Purchasing of sunflowerseed is carried out by the Board's agents. Farmers take their produce to the nearest Board's agent or depot.

In sunflowerseed marketing the Board faces three major problems. These are uncertain supply, supply of small quantities of varying quality by small scale farmers and lack of established grades.

These problems make advance planning by the Board impossible and selling and buying difficult and their remedy is long overdue.

Sunflowerseed prices are determined by the Board in consultation with the Ministry of Agriculture.

The fact that edible vegetable oils and fats processors are now allowed to buy sunflowerseed direct from farmers has made it possible for the former to contract with the latter for supply of sunflowerseed. Processors assist farmers with various inputs in return for a guaranteed supply of sunflowerseed.

Marketing of other oilseeds like groundnuts, soyabeans and sesame is also done by the Maize and Produce Board under arrangements similar to those of sunflowerseed. However, sesame seed is also marketed through the Kilifi Co-operative Union in Kilifi District, and grounnuts are marketed by the Kenya Pea-nut Company.

Rapeseed is exceptional in that it has never been marketed through the Maize and Produce Board. This crop is grown mainly on large scale farms in the Rift Valley Province and farmers sell directly to processors.

6.5.3 Copra marketing

Marketing of copra does not come directly under the Maize and Produce Board.

However, traders and processors must obtain permits from the Board authorising them to buy copra. The channels through which copra is marketed are varied In some areas, such as Kwale District, copra is purchased by private traders, processors and processors' agents. In other areas, such as Kilifi District, copra is marketed through co-operative societies. The co-operative societies purchase copra from farmers and then sell to processors through Kilifi Co-operatives Union. The Maize and Produce Board sets the minimum price to be paid to farmers, but the actual price is arrived at through negotiation between the co-operatives Union and processors.

CHAPTER 7

PROCESSING FIRMS, WHOLESALE, RETAIL SURVEYS AND ANALYTICAL RESULTS

The complete survey of the edible vegetable oils and fats industry comprised separate sample surveys of processing firms, wholesale channels and retail outlets. Three separate personal interview questionnaires were used and these are presented in appendixes 17, 18 and 19.

7.1 Processing Firms Survey

The objectives of the edible vegetable oils and fats processing firms' survey were to determine (a) criteria for choosing plant locations, (b) raw materials utilized by local firms and (c) channels through which products are distributed.

7.1.1 Locations of firms and raw materials used

Table 7.1 shows the distribution of vegetable oils and fats processing plants and also the raw materials used. Two important criteria for selecting plant location were proximity to sources of Kenyan raw materials (60%)[10] and proximity to the market for final products (20%).

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10. Per centages in brackets refer to per centages of respondents unless stated otherwise.

TABLE 7.1: NUMBER AND DISTRIBUTION OF FIRMS, THEIR RAW MATERIALS AND TYPE OF PRODUCT

Plant location	No. of firms	No. surv-eyed	Raw material used and No. of firms using them	Type of Product	
				Oil	Fat
Nairobi	2	2	Crude palm oil (2)	S_1	++
Mombasa	5	4	Copra (3), cotton seed (3), sun-flowerseed (2)	++	-
Voi	1	1	Sunflowerseed and cotton-seed	++	-
Nakuru	3	2	Sunflowerseed (2), cotton - seed (1) Sesame (1), Rapeseed (1), Linseed (1) Groundnuts (1), Maize germ (1)	++	S_2
Kisumu	1	1	Sunflowerseed cottonseed, sesame, rape-seed, and groundnuts	++	-
Western Kenya	1	0	Cottonseed	?	?
Lamu	3	0	Cottonseed, copra, sesame	?	?
	16	10			

(1) S_1 indicates that one firm in Nairobi produces small quantities of edible oils.

(2) S_2 indicates that one firm in Nakuru processes some fats

(3) ++ indicates that the product is the main one.

(4) Numbers in brackets indicate the number of firms using that raw material.

SOURCE: Author's firms survey.

The two fats processing firms had based their plant location selection on proximity to the market for final products, namely Nairobi. Both firms process fats using imported palm oil. The other (20%) based selection of location on other factors such as proximity to transportation facilities. Possible reasons for processors wishing to locate near raw materials are the latter's bulkiness and the high proportions of waste material and by-products often encountered.

The results in table 7.1 show that most firms are not specialised in the use of raw materials. Each firm utilizes different raw materials depending on their availability. The number of firms using a particular raw material is shown in table 7.2. The most commonly used oilseeds are sunflowerseed and cottonseed.

In procuring raw materials firms face competition amongst themselves and from export markets. Competition amongst the firms takes the form of price competition during auctions and tender biddings. Unlike the two hydrogenation firms that use imported crude palm oil, all the extracting firms indicated that they were not importing any raw materials. The reasons given for not importing raw materials were the existence of import

TABLE 7.2: NUMBER OF FIRMS USING VARIOUS RAW MATERIALS

Raw Material	Domestically produced Raw materials							Imported palm oil
	Sunflower-seed	Cotton-seed	Sesame seed	Rape-seed	Copra	Linseed	Ground-nuts	
Number of firms	6	6	2	2	3	1	2	2

SOURCE: Author's firms survey.

duties and lack of supplies from Uganda and Tanzania from where, hitherto, most of the oilseeds were obtained. Although there is a wide variation in the type of raw materials utilized by the oil extracting firms, only one firm used the solvent extraction method. All the others used either double or single-pressing expeller extraction equipment.

Until very recently, the vegetable edible oils and fats processing firms had not participated in raw materials production. At present some processing firms have established backward vertical integration by contracting with farmers.

All the oil extracting firms stated that they were faced with the problem of raw materials shortage. They, therefore, claimed that their outputs and sales volumes were dependent on raw materials supply rather than on demand for edible oils. Domestic supply of vegetable edible oils and fats was said to be less than demand, and only two firms ventured into the export market. However, failure of most firms to venture into export market should not necessarily be seen as the consequence of deficit domestic supply of edible oils and fats. There could be other reasons such as those mentioned in Chapter 5 section 5.2.2.

Presence of oilseeds marketing boards has affected the structure of raw materials supply as far as processors are concerned. The data in Table 7.3 does not explain the actual situation for raw materials supply structure. This is because most of the raw materials are bought by the processing firms from the Maize and Produce Board and the Cotton Lint and Seed Marketing Board. The presence of the Boards increases concentration of supply to processors and, therefore, improves the position of farmers vis a vis the processors.

The appearance in table 7.3 of zero minimum or suppliers is due to the two hydrogenation firms using crude palm oil which was imported directly without making use of middlemen.

7.1.2 Organization of edible vegetable oils and fats processing firms.

There are two distinct sectors in the Kenyan edible vegetable oils and fats industry. There is the hydrogenation or fats processing sector and the edible oils processing sector. The former sector is composed of two major firms while the latter consists of not less than 14 firms.

TABLE 7.3: SOME CHARACTERISTICS OF EDIBLE VEGETABLE OILS PROCESSING FIRMS AND RAW MATERIALS

Variable	No. of respondents (n)	Mean	Minimum	Maximum	Estimated sample total	95% confidence interval
Firm's age (years)	10	16	2	41	-	= 16 ± 9.9
No. of domestic raw material suppliers[4]	10	27	0	100	270	= 27 ± 30.0
% of physical capacity utilization	9	50	18	80	-	= 50 ± 16.3
Maximum physical capacity (M.T.)	8	9,487	2,400	35,000	75,896[2]	= 9,487 ± 7772.6
Sunflowerseed oil extraction rate (%)	4	20	14	22	-	= 20 ± 3.7
Cottonseed oil extraction rate (%)	5	11	6	15	-	= 11 ± 2.7
Copra oil extraction rate (%)	2	58	58	59	-	= 58 ± 1.0

...../2.

TABLE 7.3: CONTINUED.

% sunflowerseed becoming oil-cake	4	44	30	58	-	= 44 ± 10.5
% Cottonseed becoming oil-cake	3	51	43	65	-	= 51 ± 12.2
% Copra becoming oil-cake	2	32	30	35	-	= 32 ± 10.8
Number employed	10	149	17	1,000	1,490	=149 ± 216.3
Number of brands	10	2	1	6	20	= 2 ± 1.1
Firm's input (M.T.)[3]	8	4,993	840	17,500	39,944	=4,993 ± 4200.0

1. Maximum physical capacity is expressed in terms of raw material inputs.

2. The figure is based on raw material inputs of the 8 oil extracting firms that were surveyed.

3. Input refers to the actual raw material input in 1976 of the eight oil extracting firms but without specifying the raw material.

4. Does not include directly imported supplies straight to the processors.

SOURCE: Author's firms survey.

The largest fats processing firm employed over 1000 people in 1976 while the largest oil processing firm employed only 120 people. However, the largest fats processing firm is a multi-product line business and the number of employees allocated entirely to fats activities is smaller thar the given figure. Only three firms out of those surveyed employed over 50 people each. The edible vegetable oils processing sector is, therefore, characterised by small size firms.

In general the edible vegetable oils and fats industry was observed to be specialised in activity. Nevertheless, there were four firms that were diversified, to a greater or lesser extent. The most highly diversified was the largest fats processing firm which is a multi-product line concern. Its products included cosmetics, soaps and detergents, toothpastes and baby foods. Two of the diversified oil extracting firms were involved in soap manufacturing while the remaining one was involved in cotton ginning, maize meal and rice meal processing, soap manufucture and sisal fibre decortication. All the firms were private Kenyan companies except the large fats processing firm which is jointly owned by the Kenyan Government and Unilever.

Excess physical plant capacity was claimed by the processing firms to be a common characteristic of edible vegetable oils and fats processing operations. This situation was attributed by the respondents to shortage of domestic raw material . Although raw material shortage actually exists and will adversely affect production at certain periods, it would be wrong to accept the firms' statements as indications of serious under-utilisation of fixed plant without definite evidence. Such evidence was not provided by the study. It is quite possible that the firms are actually operating near to economic full capacities (at minimum average costs). It is important to realize that physical and economic capacities are not necessarily the same, and might in fact be expected to show some divergence in the face of changing price and cost structures.[11]

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11. Excess economic capacity could occur under sloping demand curve conditions facing individual firms or under high prices where firms enjoy pure profits and, thereby, choose to restrict output if there are barriers to entry into the industry. However, there is no data to support such conjectural arguments and further analysis along such lines is not attempted.

a) Correlations

The main findings from correlations calculated for variables of processing firms can be summarised accordingly. Table 7.4 shows that there is a very high significant positive correlation (r=0.95) between the stated maximum annual physical capacities of firms and their recorded raw material inputs. The correlation (r=0.15) between maximum annual physical capacity and per cent capacity utilized is low and non-significant at the 0.05 L.O.S. and with 8 d.f. thereby showing lack of association. This result is not inconsistent with the high positive correlation noted above.

The non-significant correlation (r=0.04) shown in table 7.4, between processing costs and maximum annual physical capacities of the firms gives no evidence for the existence of economies of size which initially was thought possible. Existence of economies of size in the edible vegetable oils and fats industry would act as a barrier to entry and as suggested previously might be a factor in determining whether production by firms was at less than economic full capacity in each case. Obviously the correlation analysis does not give full understanding in this area.

TABLE 7.4: SIMPLE CORRELATION MATRIX FOR SELECTED VARIABLES IN PROCESSING FIRMS SURVEY[1]

Processing firms' variables	Years since establi-shment	Annual maximum capacity (in tons)	Utilized physical capacity %	processing costs[2] (Shs/ ton output)	Raw material input in 1976 (in tons)	Refining losses %	Number of working shifts	Number employed in firm	Number of raw material suppliers to firms
Years since establishment	1.00	-0.37	0.03	0.33	-0.29	-0.34	0.09	0.44	-0.16
Annual max. physical capacity (m.T.)		1.00	0.15	0.04	0.95**	-0.38	0.40	0.10	0.44
Utilized physical capacity (%)			1.00	0.38	0.44	-0.24	-0.76**	0.54	-0.17
Processing cost[2] (Shs/ton output)				1.00	0.16	-0.15	0.15	0.02	-0.21
Raw material input in 1976 (M.T)					1.00	-0.42	0.58	0.28	0.36
Refining losses (%)						1.00	-0.24	-0.27	0.16

...../2.

TABLE 7.4: CONTINUED.

Number of working shifts per day							1.00	0.42	0.30
Number employed per firm								1.00	-0.21
Number of raw Material suppliers to firms									1.00

1. Obtained by missing data method discussed in Chapter 4.
2. Processing costs vary with type of raw material used.

** r significant at the 0.05 L.O.S. and with 8 d.f. (Ho: ρ = 0).

SOURCE: Author's firm survey.

However, the lack of sensitivity should not be taken as an out right rejection of economies of size. Rather it calls for further testing of the hypothesis.

The only remaining significant correlation coefficient in table 7.4 is that for per centage utilized physical capacity in firms and the number of working shifts per day. Here the coefficient was 0.76, significant at the 0.05 L.O.S., showing positive association, a result which could be expected. All other correlations in table 7.4 were non-significant at the 0.05 L.O.S. and with 8 d.f.

b. Non-price competition from the large processing firm.

If we assume that the behaviour of the large firm and the structure of the industry as a whole indicates that economies of size for the existing processing firms are largely absent, then the following commentry can be given. Existence of product price control prevents or conceals the price leadership aspect of the large fats processing firm. Nevertheless, this large fats processing firm can be regarded as a leader in non-price competition in the form of advertising. The firm is engaged in very aggressive advertising compaigns, especially for three of its major products.

All the other firms are relatively small and do not engage in intensive advertisement. The reason for this is likely to stem from the high costs involved. Advertising increases costs per unit of output and the increment is greater the smaller the volume of sales. A firm with large sales is able to spread advertisement costs, thereby, reducing them per unit of output.

One important aspect of behaviour of an industry with minimum efficient scale-a feature which seems to characterise the processing firms under discussion - is that it tries to raise average cost curves by advertising, in order to forestall potential entrants. The large fats processing firm is able to engage in intensive brand-image advertising because of its large volume of sales which enables it to spread the advertising costs over a large number of units. Similar advertisement costs would be too high per unit for the small firms.

Another aspect of behaviour of an industry without absolute cost advantage from economies of size is that of brand proliferation. Brand proliferation acts as a barrier to entry. Existence of such a situation in the industry under discussion is demonstrated by the large fats processing firm which has no less than five brands of fats.

c) Processors' margins

In order to estimate approximately the margins made by processors, calculations were made using processing costs given by processors and available raw material prices. These margins were defined as (a) the mark-up per centage or (b) the mark-ups on total costs, when processors sold to wholesalers. Average processing costs of KShs.400 for copra and cottonseed and KShs.500 for sunflowerseed per metric ton of oil output were calculated from data provided by processors.

The following average prices for raw materials were used in the calculations:

Sunflowerseed =KShs.1250 per metric ton,
Cottonseed = " 800 " " "
Copra = " 2600 " " "

Cottonseed price is the average of the two grades AR and BR.

Other factors considered in estimating production costs were raw material losses through spoilage and shrinkage and also packaging costs. Packaging costs were assumed to be uniform per unit, regardless of quantity packaged, at KShs.1.32 (14, p.8).

The raw material losses used in calculations were estimated as follows:

Sunflowerseed = 5% loss,

Cottonseed = 5% loss

Copra = 20% loss

The total production costs were calculated using the formula

$$P_c = \frac{100Pr}{R_r} + \frac{(100P_r)r}{R_r 100} + C_p + M_p .$$

where P_c = production costs per metric ton of oil output

P_r = price of one metric ton of raw material

R_r = Oil extraction rate (%) for the raw material,

r = raw material loss through spoilage and shrinkage (%)

C_p = processing cost per metric ton of oil output

M_p = packaging cost per metric ton.

The value $100P_r/R_r$ is the cost of raw material equivalent of one metric ton of oil output. The resultant production costs for the three oils are shown in table 7.5. Table 7.3 contains information on oil extraction rates from raw materials and corresponding proportions that constitute oil-cake by-products, used in the calculations for table 7.5.

TABLE 7.5: PRICES, COSTS, RETURNS AND ESTIMATED MARGINS FOR EDIBLE VEGETABLE OILS PROCESSORS

	Sunflower seed Oil	Cottonseed Oil	Copra Oil
1. Exfactory price per ton (Shs.)	11000[1]	10312[1]	7500
2. Total costs (including packaging) per ton (Shs.)	8382	9357	7099
3. Margins (Shs.) (1 - 2)	2618	955	401
4. Margins as % of (2)	31%	10%	5.6%
5. Quantity of oil-cakes corresponding to 1 ton of oil output	2.2	4.8	0.55
6. Price per kg. of oil-Cake (Shs.)	0.50	0.40	0.60
7. Returns from oil-cakes (Shs.)	1100	1920	330
8. Total returns (Shs.) (1 + 7)	12100	12232	7830
9. Margins in (Shs.) (8 - 2)	3718	2875	731
10. Margins (9) as % of (2)	44%	31%	10%

1. Price control legal notice for June 1976 (the prices were converted to per metric ton basis from per Kg. basis).

2. (12)

SOURCE: Author's Survey.

It should be noted that the processors' given extraction rates for cottonseed (11%) and sunflower-seed (20%) are extremely low compared with the normal average rates of 15 and 35 per cent respectively often encountered.

Table 7.5 reveals at least three important characteristics of edible vegetable oils and fats margins obtained by processors. First, processors margins are relatively high compared with those obtained by wholesalers (table 7.6). Second, the level of margins varies with the type of raw material used in oil extraction. Third, appraisal of margins on the basis of edible oil prices alone, ignoring returns from oil-cake, is unrealistic.

The case of the copra oil margin is different from that of other oils in that most of it applies to a single type of user, namely soap manufactururing firms. The relatively low margin for copra is due partly to an overestimate for packaging (similar costs per kg were used for all three oils). However, another reason why the margin is low is that the price of copra oil sold to manufacturers is not Government controlled. Processors must negotiate prices to a reasonable level.

Margins for sunflowerseed and cottonseed oils illustrate that oil-cake returns should not be overlooked. Different raw materials have different extraction rates and, therefore, proportions of raw materials constituting oil-cake vary. Moreover, although oil-cakes can be called by-products they are nonetheless important in themselves. In fact, sometimes oil-cake can be more important commercially than oil, if demand for the former is so strong that it leads to more favourable prices.

When oil-cakes are considered in calculating processors margins (table 7.5), the cottonseed margin increases by 21 per cent (from 10 to 31%) while that for sunflowerseed increases by 13 per cent (from 31% to 44%). The reason for the differences in increase is that a higher proportion of cottonseed (51%) goes to oil-cake than the corresponding proportion of sunflowerseed (44%).

It is thought that the very low extraction rates given by processors have led to under-estimation of margins. Thus, actual margins are likely to be higher than those obtained in table 7.5. In fact the Industrial Survey and Promotion Centre (13, p.4) estimated margins of 34.4 per cent for sunflowerseed oil without sales tax and 18.48 per cent with 10 per cent sales tax.

However, these margins were obtained without considering returns from oil-cake and, therefore, the margins would have been even higher if oil-cakes had been included.

It was not possible to calculate the margins made by the fats processing firms (costs were not available) but the Industrial Survey and Promotion Centre calculated in 1975 a margin of 48.80 per cent (13). Thus, the margins for fats processing firms would seem to be quite high.

7.2. Wholesale Survey

The wholesale survey was conducted in both Mombasa and Nairobi. The survey was intended to show the structure and characteristics of the wholesale edible vegetable oils and fats distribution channels as an important part of the total distribution system.

The wholesale survey revealed that the edible vegetabl oils and fats distribution system as a whole is characterised by a lack of vertical integration or strong relationships among participants. In general, wholesalers are not affiliated to processors except for some major distributors who have close ties with individual processors.

Similarly, there are no strong attachments between individual wholesalers and individual retailers.

Lack of vertical integration in the edible vegetable oils and fats distribution system is indicated by non-participation of processors in the marketing of their products and also by general lack of credit assistance from processors and wholesalers in the distibution chain. Wholesalers sometimes receive delivery services from processors but very rarely do they get credit services. Only about 5 per cent of wholesalers interviewed were able to purchase edible oils and fats on short term credit.

Another characteristic of the edible vegetable oils and fats industry that was revealed by the survey in the lack of competition among existing processing firms. This conclusion is arrived at from the observations made above and also from the mainly passive role played by processors in initiating business transactions. Generally, wholesalers contact processors to make orders. However, processors can sometimes contact wholesalers, particularly when they have accumulating stocks, but these occurences are not frequent enough to deny that processing firms are sure of a market for their products and do not have to search aggresively for customers.

Lack of competition among processors was attributed to shortage of edible oils and fats in the domestic market. Its existence was also indicated by the fact that fats processing firms sometimes demand payment in advance. In addition wholesale buyers usually have to make orders long before the date products are needed.

Domestic wholesalers were found to belong to two categories. One category is made up of those involved purely in wholesaling. The other group consists of those who engage in both wholesaling and retailing. The proportionate breakdown was such that 55 per cent belonged to the former category and 45 per cent belonged to the latter.

The wholesaler - retailer group consists mainly of small African grocers who are relatively new in the wholesale business. Thus only a small proportion of wholesaled edible vegetable oils and fats is handled by them. Furthermore the survey showed that only 5.6 per cent of their purchases of edible oils and fats was retailed.

An attempt was made to determine margins accruing to wholesalers. These margins are expressed as the differences between selling and buying prices and also

as per centages of buying prices. The calculated margins are presented in table 7.6. Wholesalers felt that their margins were too low. Nevertheless, most wholesalers indicated that they traded in edible oils and fats because these products have a compensating high rate of turnover.

The wholesale survey indicated that shortages in edible oils and fats supply were a common feature. Very often these shortages are short-lived. Wholesalers were not able to say whether or not there is seasonal variation in edible vegetable oils and fats supply. The only claims made were that serious shortages occur mainly just before budget day or when controlled price changes are expected.

All of the above discussion has concentrated on wholesalers and their dealings with processors. Therefore, brief mention is made here of the relationship between wholesalers and retailers concerning trade in edible oils and fats.

The wholesale survey results show that retailers received only limited services from wholesalers. Most of the former collect their purchases from the latter's warehouses.

TABLE 7.6: WHOLESALERS' MARGINS AND STOCKING FREQUENCIES OF VARIOUS OILS AND FATS BRANDS (sample = 20)

Brands (Types)	Frequency of wholesalers stocking item	% frequency of wholesalers stocking item	wholesalers' margins (Shs.)	Wholesalers' margins as % of purchase price
FATS				
Kimbo[1]	19	20.0	5.00	4.3
Cowboy[1]	19	20.0	5.00	4.3
Kimboga[1]	4	4.2	2.40	4.3
Eagle[1]	6	6.3	4.40	4.0
Veebol[1]	3	3.2	7.00	5.0
Ndege[2]	7	7.4	2.00	5.0
Cofat[2]	-	-	-	-
Acif Deep Frying Fat[2]	1	1.0	5.00	3.6
Kapa	4	4.2	3.00	6.7
K.C.C. Superfine Ghee[3]	0*	0	-	-
Pure Lard[3]	0*	0	-	-
S.B.F.[1]	1	1.0	6.50	4.9
Blue Band Margarine[1]	17	17.9	5.40	4.7
Croma catering margarine[1]	1	1.0	7.00	4.6

TABLE 7.6: CONTINUED.

OILS				
Elianto Sunflower Oil	3	3.2	2.30	6.5
Elianto Pure Corn Oil	1	1.0	7.80	11.0
Mazola Corn Oil	0+	0	-	-
Coastal Double-refined Edible Oil	3	3.2	2.50	2.6
Coastal Semi-refined Edible Oil	1	1.0	5.00	3.2
Suna Sunflower Oil	2	2.1	7.00	4.2
NOM Sunflower Oil	1	1.0	7.00	4.2
Acif Semi-refined Edible Oil[2]	1	1.0	5.00	3.2
OM Sunflower Oil	1	1.0	5.00	2.9
T O T A L	95	99.7%	-	-

1. Products of same firm (E.A.I.)
2. Products of same firm (Acif Ltd.)
3. Animal Fats
+ Not distributed through wholesalers

SOURCE: Author's wholesale survey.

However, a large number of wholesalers provide some delivery services to nearby retailers. Such services often consist of small quantities transported by handcarts. Occasionally, some wholesalers provide short term credit to a few selected retailers. This credit involves the retailer being allowed to carry goods on condition that money is paid later on the same day or on the following day. Thus, retailers receive very limited assistance from wholesalers who in turn, also receive quite limited assistance from processors.

In order to assess the importance of various brands of edible vegetable oils and fats in the domestic market, especially in the surveyed areas, frequencies of brand names were calculated. Frequencies refer to numbers of wholesalers handling a given brand and results are shown in table 7.6. The table also shows per centage frequencies of wholesalers stocking individual brands.

From table 7.6 it can be seen that the highest wholesalers' brand stocking frequencies were exhibited by Kimbo, Cowboy and Blue Band Margarine. These three products belong to the large fats processing firm and their high frequencies indicate the latter's dominance.

This firm's products accounted for 63 per cent of the total wholesaler frequency counts for the different product brands.

Appendix 16 also shows that edible vegetable fats dominate the domestic market. The edible vegetable fats brands accounted for 87.2 per cent of the total wholesaler stocking frequencies and edible vegetable oils brands accounted for only 12.8 per cent. The results discussed so far depict the situation in Nairobi and Mombasa where wholesale sub-samples were taken. Thus the actual situation in other areas cannot be stated although it can be presumed that fats sales dominate edible oils sales throughout the country, and that products of the large fats processing firm are dominant in the domestic market.

The list of edible oils and fats provided in table 7.6 is not exhaustive, especially for edible vegetable oils. Some brands of edible vegetable oils processed by firms outside Mombasa and Nairobi were not observed during the wholesale survey. Absence of these products in the two towns may suggest that edible vegetable oils are largely consumed in areas where processing firms are located. For instance, products of firms located in Kisumu, Western Kenya and Voi were not encountered either in Mombasa or in Nairobi. Furthermore, products processed in

Mombasa had very high wholesaler frequency counts there but very low ones or no counts at all in Nairobi.

In contrast, products of processing firms located in Nakuru town have penetrated and spread widely in the domestic market as evidenced by their presence in Mombasa and Nairobi. In fact one of these firms produces edible vegetable oils that are commended for their high quality and these products are among the most popular in Nairobi and Mombasa.

The wholesale survey indicated that animal fats are not distributed through wholesalers. The two animal fats shown in table 7.6 were observed during the retail survey but not during the wholesale survey. These products are distributed directly from processors or agents to retailers without passing through wholesale channels.

Wholesale distribution of edible vegetable oils and fats was found to be non-specialised. These products were just a part of many items handled, both edibles and non-edibles. Nevertheless, results in table 7.7 show that edible oils and fats constitute a fairly large proportion of wholesalers' turnover. On average, edible oils and fats accounted for 36 per cent of wholesalers' turnover by value but ranged from 10 to 90 per cent.

TABLE 7.7: EDIBLE OILS AND FATS WHOLESALE TRADE CHARACTERISTICS

Variables	No. of respondents (n=)1	Mean	Minimum value	Maximum value	Standard deviation	95% confidence interval
Ages of the wholesale establishments (yrs)	15	9.9	2.0	38.0	10.0	=9.9± 5.5
Oils and fats sales as per cent of total turnover by value	10	36.0	10.0	90.0	16.0	=36.0± 11.4
Number of customers per week per wholesaler	12	57.4	8.0	180.0	38.0	=57.4± 24.1
Percent of oils and fats retailed by wholesalers	14	5.6	0.0	60.0	13.2	= 5.6± 7.6
Oils and fats weekly turnover by value (K.Shs.)	10	30345.5	500.0	115,000.0	26,391.2	= 30345.5 ±18877.8

1. The survey sample size was 20 wholesalers and the values of n' are those of actual respondents.

SOURCE: Author's wholesale survey.

Table 7.7 shows that there were on average 57 retail customers per wholesaler per week. This figure is not very informative because some retailers purchase edible oils and fats more than once a week.

Data in table 7.7 also contains information on the age of wholesale establishments. The average age of wholesale businesses was found to be about 10 years. This is to be expected when it is realized that it was only after attainment of independence in 1963 that Africans had apportunities of undertaking big businesses like wholesaling. Most African wholesalers were observed to have been in business for less than 10 years. Their Asian counterparts were found to have been in business for longer periods of time.

7.2.1 Correlations for wholesale variables

Table 7.8 contains wholesale variables for which correlations were calculated. All the correlations in table 7.8 were found to be non-significant at the 0.05 L.O.S. and with 18 d.f.

Lack of significant relationships amongst the variables in table 7.8 is possibly a consequence of data deficiency and the use of missing values method discussed in Chapter 4, which if there are missing values will tend to show non-correlation.

TABLE 7.8: WHOLESALE VARIABLES SIMPLE CORRELATION MATRIX[1]

Edible vegetable oils and fats wholesale variables	Ages of wholesale establishments (years)	Oils and Fats as % of turnover by value (Shs.)	Weekly turnover by value (Shs.)	Number of retail customers per week	Retailing done by wholesalers as % of their oils & fats sales by volume
Ages of wholesale establishment(s)	1.00				
Oils and Fats % of total turnover (Shs)	-1.00	1.00			
Weekly turnover by value (Shs.)	0.25	0.08	1.00		
Number of retail customers per week	-0.19	-0.07	-0.06	1.00	
Retailing done by wholesalers as % of their oils & fats sales by volume	-0.05	0.03	-0.03	-0.03	1.00

1. All the coefficients (r) were non-significant at the 0.05 L.O.S. with 18 d.f (Ho: $\rho = 0$). The results are subject to missing data method discussed in Chapter 4.

SOURCE: Author's Survey.

7.3 The Retail Survey

7.3.1 General characteristics of edible oils and fats retail outlets.

The edible oils and fats retail survey was done in Nairobi only. In describing the retail outlets references are made to low-middle and middle-high income consumer outlets. Separation of retail outlets into these two categories was based on (a) locations of retail outlets and (b) information given by retailers about the type of customers they serve. Actual income levels of consumers were not determined since no consumer survey was conducted.

Out of the total number of retailers (35) surveyed, 20 per cent fall in the middle-high income retail outlets category, while the rest, 80 per cent, fall in the low-middle income retail outlets category.

- As in the case of the wholesale survey, the relative importance of various fats in the domestic market (Nairobi) was indicated by stocking frequencies among the outlets. In aggregate 97 per cent of retailers sold fats while 63 per cent sold edible oils. Overall, 60 per cent of retailers sold both edible oils and fats, 37 percent of them sold fats alone and 3 per cent sold edible oils alone.

While brands of oils differed between low-middle and middle-high income retail outlets, the same types of fats were found in both categories. The edible oil brands found in low-middle income retail outlets were mainly those packaged by private agents and, therefore, not by processors themselves. These brands were characterised by relatively low quality.

Frequency of retail outlet stocking of various brands of edible oils and fats, as shown by the survey, are presented in table 7.9. From this standpoint, the most popular fats in the domestic market (Kimbo and Cowboy) and the most common margarine (Blue Band) all appeared individually in 97 per cent of the retail grocers' shops surveyed. On the other hand, the most common edible oil (Elianto Sunflower Oil) was observed in only 23 per cent of the retail outlets.

Popularity of various brands was also examined by finding out which ones held first and second position in terms of sales volume in individual outlets. Amongst fats, Kimbo held first position in 77 per cent of the cases, and Cowboy held second position in 77 per cent of the cases. Thus, these two brands which are products of the same processing firm dominate first and second positions in terms of sales volume.

TABLE 7.9: RETAIL OUTLET STOCKING FREQUENCY OF VARIOUS BRANDS OF EDIBLE OILS AND FATS (Sample = 35)

	Retail outlet stocking frequency for brands	Retail outlet stocking frequency for the best selling oil or fat (by volume)	Retail outlet stocking frequency for the second best selling fat or oil (by volume)	Retail outlet stocking frequency brand share (%)[2]
	1	2	3	4
Kimbo	34	27	3	18.4
Cowboy	34	2	27	18.4
Kimboga	9	-	-	4.7
Eagle	9	1	-	4.7
Veebol	1	-	1	0.5
Ndege	5	1	-	2.7
Cofat	3	-	-	1.6
Acif Deep Frying Fat	1	-	-	0.5
Kapa	5	-	-	2.7
K.C.C. Superfine Ghee	3	-	-	1.6
Pure Lard	2	-	-	1.1
Blue Band Margarine	34	-	-	18.4
Elianto Sunflower Oil	8	5	1	4.3
Elianto Pure Corn Oil	6	1	1	3.2

TABLE 7.9: CONTINUED

	1	2	3	4
Mazola Corn Oil	5	-	2	2.7
Coastal Double-refined Edible oil	2	-	-	1.1
Coastal Semi-refined Edible oil	1	-	-	0.5
Suna Sunflower Oil	3	-	1	1.6
Nom Sunflower Oil	1	-	-	0.5
Acif Semi-refined Edible Oil	1	-	-	0.5
J.P. Salad oil	8	4	-	4.3
Brighton Brand sun-flower Salad oil	5	1	-	2.7
P.D.M. Super Edible Oil	2	1	-	1.1
Peptang Sunflower Oil	1	-	1	0.5
N.S.P. Salad oil	2	-	-	1.1
	185	-	-	99.4

1. Stocking frequency refers to number of retail outlets handling a given brand
2. Obtained by dividing individual brand stocking frequency (Col.1) by total frequency (185)

SOURCE: Authoris Retail Survey

The retail outlet stocking frequencies of products of various processing firms are shown in Appendix 16. It can be seen that 82 per cent of stocking occurrence was accounted for by fats produced by East African Industries. Only 8 per cent of the occurences was accounted for by fats of the second largest fats processing firm (Acif Ltd.)

Assessment of the situation with regard to edible oils was not as straightfoward as in the case of fats. First, a larger number of firms is involved in processing edible oils. Second, there were differences between the types of products found in low and high income retail outlets. Third, the ranking of brands into first and second positions in terms of sales volume was found to be more difficult. Only about 37 per cent of the interviewed retailers were able to name the brands which held first position.

Again an attempt was made to determine positions of various brands in terms of stocking frequency by the retail outlets. It must be understood, however, that stocking frequency by itself does not indicate market share because some brands were very frequent but only sold in small quantities.

It was found that, in terms of stocking frequency, two products (Elianto Sunflower and Corn Oils) accounted for 31 per cent of all edible oils retail outlet occurrences. In addition, these two products were mainly found in the middle-high income retail outlets, usually in large quantities. In the low-middle income retail outlets, the most commonly stocked brand, J.P. Salad oil, was believed by retailers to be of relatively low quality. This particular brand was also said by retailers to have a very low rate of turnover and could stay in shops for months.

Retailers obtain their supplies of edible oils and fats through the two main channels: wholesalers and processors. Amongst the interviewed retailers 29 per cent was buying some or all supplies direct from processors. Those buying from processors were mainly supermarkets and self-selection stores. The supply of edible oils and fats obtained by retailers from processors constituted 21 per cent of Nairobi's total supply of these items.

(a) Correlations for retail outlets variables

Correlations were calculated for the three retail outlet variables presented in table 7.10.

TABLE 7.10: SIMPLE CORRELATION MATRIX FOR RETAIL OUTLETS VARIABLES[1]

Edible Oils and fats Retail Outlet variables	Monthly turnover (KShs.)	Number of whole sale suppliers	% by volume supplied from processors
Monthly turnover (KShs.)	1.00		
Number of Wholesale suppliers	-0.07	1.00	
% by volume supplied from processors	0.28	-0.48**	1.00

** = r significant at 0.05 L.O.S. and 33 d.f. (Ho: ρ = 0)

1. Subject to missing data method discussed in Chapter

Source: Author's retail survey.

Out of the three correlations only the negative one between the number of wholesalers supplying a given retailer and the percentage of supply from processors (r=0.48) was significant at the 0.05 L.O.S. and with 33 d.f. The non-significance of the other two correlations should not be taken as confirmation that there were no associations between the variables, since the limitations of the computer programme were such that provision of missing data estimates would only act to mask associations.

(b) Retail outlet regression models

Two simple linear regression models were formulated for the three variables considered in the correlation analysis. The two models were:

7.1 (a) $T=a_1 + b_1P + e$

7.2 (a) $P=a_2 - b_2W + e$

where T = monthly turnover in Shs.

P = per cent by volume of edible oils and fats supplied by processors.

W = number of wholesalers supplying a retailer, and

e = error term.

The assumption for the first model was that monthly retail outlet turnover was positively related to per centage by volume of edible oils and fats supplied by processors. This relationship was hypothesised as based on the observation that the large retail outlets, super-markets and self-selection stores, bought most of their edible oils and fats from processors.

The assumption for the second model was that per centage by volume of products supplied by processors was negatively related to the number of wholesalers supplying a given retailer.

The results were as follows:

7.1 (b) $T=2263.3 + 404.4P^{**}$ $(R^2=0.13)$

7.2 (b) $P= 27.7 - 5.6W$ $(R^2=0.08)$

The R^2 values were very low in both cases and only the regression coefficient for per cent by volume of edible oils and fats supplied by processors, in the first regression equation, was significant. The computer programme for these calculations again used a missing data technique which would only serve to disguise any relationship.

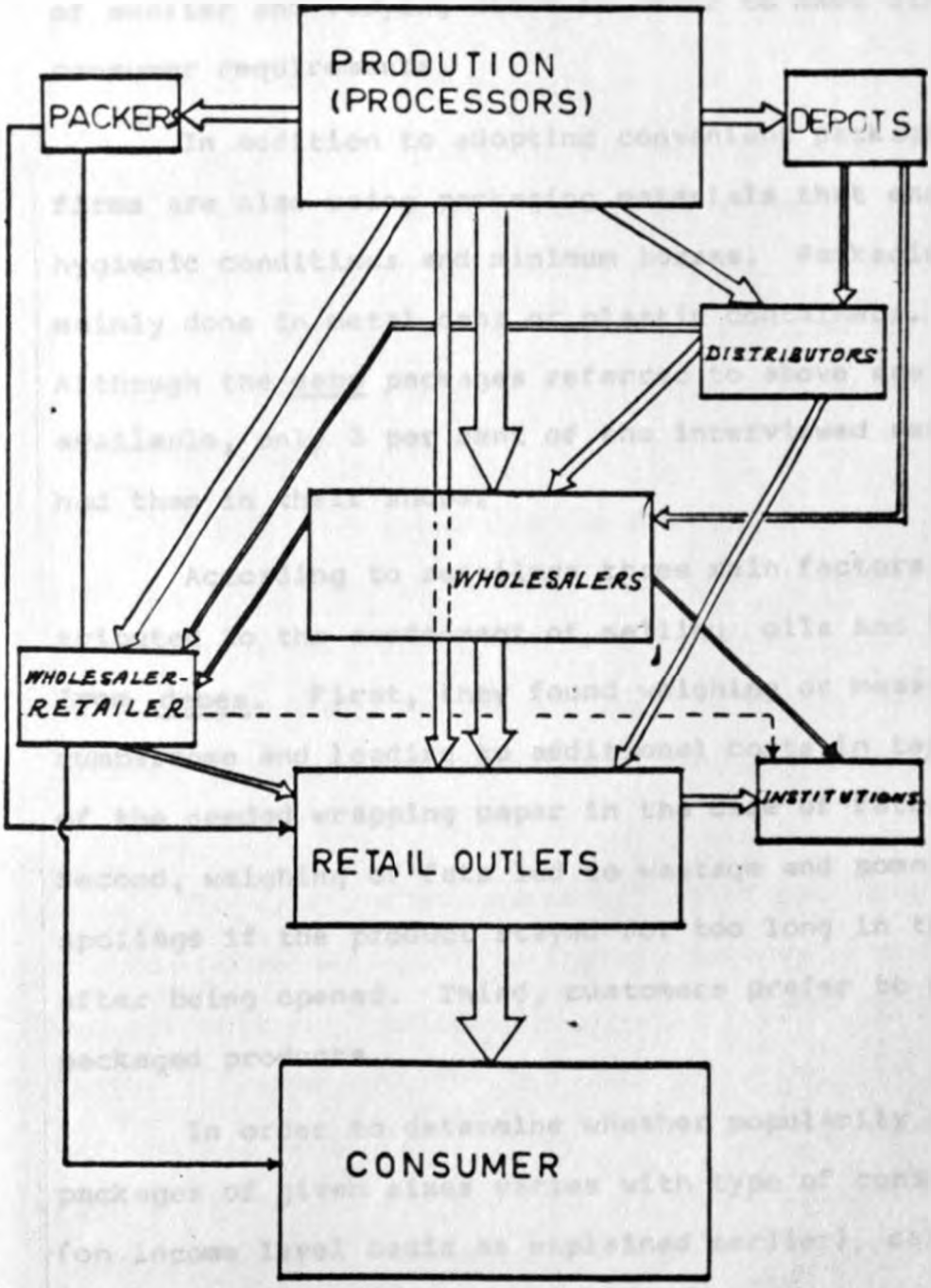
7.4 Edible Oils and Fats Distribution Chain

In summary to the findings presented for the processing, wholesaling and retailing of edible oils and fats, figure 7.1 below shows the important relationships between the main elements in the distribution chain from processors to consumers.

7.5 Packaging

Edible oils and fats presentation methods have been greatly revolutionised in recent years. Previously, the commonest packages were debes (tin cans) which have capacities of between 17 and 18 Kgs each. Such large packages meant that at the retail level required quantities had to be measured out by weighing or by other means, and then fats were wrapped in paper. Consequently, contamination and losses through absorption by the wrapping paper were inevitable.

Figure 7.1 Domestic edible oils and fats industry distribution chain structure



The present trend in product presentation is that all edible oils and fats processing firms are adopting the system of packaging their products in containers of smaller and varying sizes in order to meet different consumer requirements.

In addition to adopting convenient package sizes, firms are also using packaging materials that ensure hygienic conditions and minimum losses. Packaging is mainly done in metal cans or plastic containers. Although the debe packages referred to above are still available, only 3 per cent of the interviewed retailers had them in their shops.

According to retailers three main factors contributed to the abodonment of selling oils and fats from debes. First, they found weighing or measuring cumbersome and leading to additional costs in terms of the needed wrapping paper in the case of fats. Second, weighing of fats led to wastage and sometimes spoilage if the product stayed for too long in the tin after being opened. Third, customers prefer to buy packaged products.

In order to determine whether popularity of packages of given sizes varies with type of consumer (on income level basis as explained earlier), sales

ranking of the five packages of the most popular fat (Kimbo) was conducted. As shown in table 7.11, package popularity was based on the number of times each of the five pack sizes held positions 1st to 5th in terms of sales volume.

The results show that the smallest pack size (100 gm) held 1st position the highest number of times in the low-middle income retail outlets. Conversely, the largest pack size (2kg) held 1st position the highest number of times in the middle-high income retail outlets.

Table 7.11 shows that on the basis of sales volume, popularity of package decreased in the low-middle income retail outlets as their sizes increased. On the other hand, in the middle-high income retail outlets popularity of packages increased as their size increased.

The five package sizes were also analysed to see whether there was any relationship between pack size and per unit (Kg) price of product. Table 7.12 and figure 7.2 show that the per unit price was the same for the two small pack sizes. This is followed by a rise in price for the 500 gm pack and a steep drop for the 1 kg and 2 kg packs.

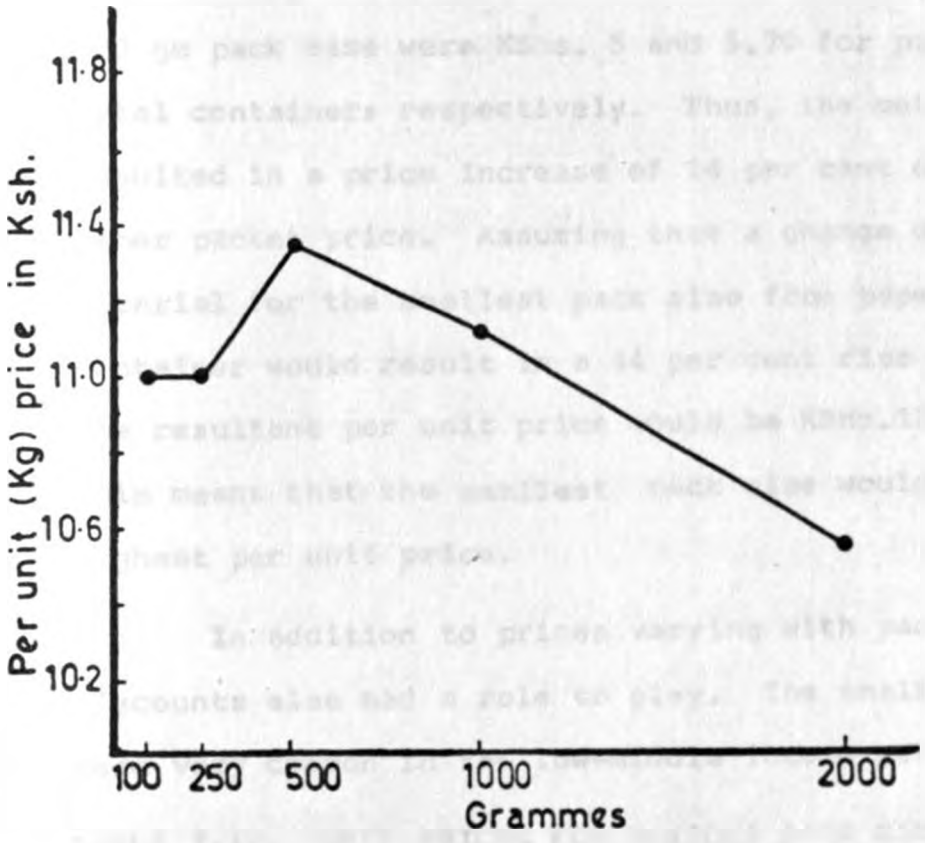
TABLE 7.11: Kimbo Fat Package Sales Ranking[1] Distribution By type of Retail Outlet.[2]

Type of Retail Outlet	Package sales ranking position	Kimbo package sizes and their sales ranking frequency accross retail outlets				
		100 gm	250 gm	500 gm	1 kg	2 kg
Low-middle Income retail Outlets	1st	13	3	7	4	1
	2nd	3	9	7	6	2
	3rd	0	8	10	3	2
	4th	2	2	2	7	1
	5th	1	0	0	0	7
(n = 28)		19	22	26	20	13
Middle-high Income retail Outlets	1st	0	0	1	1	5
	2nd	0	0	0	6	1
	3rd	0	2	3	0	1
	4th	0	2	1	0	0
	5th	0	0	0	0	0
(n = 7)		0	4	5	7	7
All the retail Outlets Combined	1st	13	3	8	5	6
	2nd	3	9	7	12	3
	3rd	0	10	13	3	3
	4th	2	4	3	7	1
	5th	1	0	0	0	7
(n = 35)		19	26	31	27	20

1. Sales ranking was done on basis of individual pack size sales volume.
2. Retail outlets were only able to rank package size sales on a 1st to 5th basis for the sizes actually stocked and sold. Hence some outlets could only rank for less than five package sizes.

SOURCE: Author's Retail Survey.

Figure 7-2: Per unit prices and pack size relationship for Kimbo fat in retail outlets.



The two small packages are paper packets while the others are metal containers (500 gm pack can also be in paper packet). If all the packages were of the same packaging materials, the per unit price could be expected to be highest for the smallest pack size. This observation is supported by the fact that the controlled prices for the 500 gm pack size were KShs. 5 and 5.70 for paper and metal containers respectively. Thus, the metal container resulted in a price increase of 14 per cent over the paper packet price. Assuming that a change of package material for the smallest pack size from paper to tin container would result in a 14 per cent rise in its price, the resultant per unit price would be KShs.12.54 per Kg. This means that the smallest pack size would have the highest per unit price.

In addition to prices varying with pack size, discounts also had a role to play. The small pack sizes were very common in the low-middle income retail

TABLE 7.12: UNIT PRICES FOR VARIOUS PACK SIZES OF KIMBO FAT IN RETAIL OUTLETS

Pack size	100 gm	250 gm	500 kg	1 kg	2 kg
Unit price (Shs/Kg)	11.00	11.00	11.35	11.12	10.54
% change from 11.00 Shs/kg	0.00	0.00	3.18	1.09	-4.18

SOURCE: Author's calcualtions based on retail survey dat

outlets and the large ones were commonest in the middle-high income retail outlets. Discounts on edible oils and fats are very common in the middle-high income retail outlets. Consequently, average retail prices of the large packs tended to be lower than the controlled maximum prices, while prices of the small packs tended to remain at controlled levels.

7.6. Retail Prices and Pricing System

7.6.1 Present pricing system

In Kenya edible oils and fats are grouped under the essential commodities category. Essential commodities are those items that affect directly the cost of living. Consequently, edible oils' and fats' prices are controlled by the Government. The main objective of this price control is to protect the low income consumer by ensuring that products are provided at the lowest possible price.

In price determination emphasis is put upon production costs, especially on cost of raw material. There is a Costings Section in the Price Control Division of the Ministry of Finance and Economic Planning. This Costings Section examines processors' accounts and determines costs involved in processing operations.

The first fats' and edible oils' price control order came into effect in 1973. This order specified the types of oils and fats included in the price control schedule and indicated the maximum prices to be charged by processors, wholesalers and retailers. The specified maximum prices included and still include service charges, delivery, loading and unloading charges and, where applicable, sales tax.

Hitherto, quality has not been given sufficient attention in the edible oils and fats price determination process. Prices are set on the basis of general characteristics but without giving consideration to specific quality standards. For instance, prices are generally specified as being of semi-refined or double-refined edible oils. This general specification is deficient because semi-refined or double-refined products of different firms are not necessarily of the same quality. This is so because different processing firms may be using varied refinement specifications and thereby producing products of varying quality.

Prices of edible vegetable oils in the domestic market vary with the raw material from which they are processed. For example, the price of double-refined corn oil is higher than that of double-refined sunflowerseed oil which, in turn, has a higher price than that of double-refined cottonseed oil.

While it cannot be disputed that price of raw material has influence on the controlled price of edible vegetable oils and fats, it must also be realised that other factors may also exert some influence. These other factors could be (a) nutritive value, (b) physical characteristics, (c) consumer preference as well as other considerations. However, it was not possible to detrmine whether all or some of these factors are considered in price determination.

Another important aspect of domestic edible oils and fats pricing system is that there are no spatial price differences. The maximum control prices are uniform for the whole country and they have to absorb transportation costs. As mentioned earlier in this chapter, these uniform prices seem to favour localization of markets around the plants. However, the scope of this study did not permit investigations to be conducted on edible oils and fats interregional trade.

The opinion expressed by officials concerned with price control was that it should be avoided, where possible, and free market forces should be allowed to operate. Nevertheless, these officials stated that when welfare of the low income consumer needs safeguarding, then, price control becomes necessary.

It is hoped that when edible oils and fats production and competition increase sufficiently, price control would be waived. At present, the domestic edible oils and fats supply does not meet the corresponding demand.

Different edible vegetable oils and fats processing firms prefer different pricing systems. Amongst the processors surveyed 30 per cent preferred free market pricing mechanism, 40 per cent preferred retention of price control, while the remaining 30 per cent did not respond.

Those edible vegetable oils and fats processing firms that did not respond included the two fats processing ones. It is probable that these two firms did not want to reveal their opinion due to their dominance in the domestic market for edible fats.

The edible vegetable oils processing firms that preferred a free market pricing mechanism could have been guided among other things by one or both of the following factors. These firms may have the ability to acquire and maintain larger market shares. They may also operate at relatively lower average production costs and would, therefore, be more competitive in a free market. These possibilities, however, were not verifiable due to lack of the relevant data.

One reason why the edible vegetable oils and fats processing firms would prefer retention of price control could be that the latter offers protection from competition.

7.6.2 Edible oils and fats absolute and deflated retail price movements.

In this sub-section, secondary data is used in the analysis. The Central Bureau of Statistics regularly collects retail prices of various commodities. The data used in this analysis is based on "The Middle Income Index of Consumer Prices" for Nairobi, as recorded by the Bureau. The Bureau uses the Middle Income Index of Consumer Prices to determine retail price changes of goods and services consumed by persons in the middle income brackets. The weights used in this analysis are those of the new index, as revised in August 1971. In the revised index, a middle income household is one with an income between KShs.400 and 1,400 per month or K£.240 - 840 per annum. The revised index weights are shown in table 7.13 which also indicates the goods included in the cost of living index. The Food group as a whole takes a weight of 412 out of a total weight of 1,000. Edible oils and fats take a weight of only 17.

TABLE 7.13: REVISED MIDDLE INCOME INDEX (WEIGHTS) OF CONSUMER PRICES (AUGUST 1971 = 100)

GROUP		WEIGHT
1. Food:		
Oils and fats		17
Kimbo	8	
Margarine (Blue Band)	2	
Ghee (Milda)[1]	3	
Cooking Oil (Salad Oil)	4	
Cereals		101
Vegetables and Fruits		59
Meat and Fish		95
Other miscellaneous foods		140
TOTAL FOODS		412
2. Drinks and Tobacco		44
3. Clothing and Footwear		51
4. Furniture and Utensils		26
5. Fuel, Light and Water		50
6. Household Operation		23
7. Personal care and Health		23
8. Recreation and Entertainment		13
9. Transport		65
10. School Fees		69
11. Rent		224
ALL GROUPS		1,000

1. Milda was formally imported from Uganda but its importation has ceased and has been replaced by the domestic product, Cowboy.

SOURCE: Statistical Abstract of Kenya, 1976.

Appendix 11 contains data on the middle income index of consumer prices for Nairobi. Appendix 12 contains the absolute and deflated retail prices as well as price relatives of Kimbo and cooking oils. The latter appendix also contains the cost of living index and international palm oil import price for a period of 65 months. Figures 7.3 and 7.4 show movements of prices and cost of living index presented in Appendix 12. Figure 7.3 shows that absolute retail prices of Kimbo and cooking oils have been rising and have persistently remained above the August 1971 prices (base prices). The August 1971 prices were used as base in the analysis so as to correspond with the base prices for the new index of the consumer prices. Figure 7.3 shows that the retail prices have changed in a stepwise manner in most cases during the studied period. The stepwise price changes are mainly a result of price control. Steps correspond to different control prices.

When expressed in deflated terms, retail prices of Kimbo and cooking oils dropped considerably between July 1974 and August 1976. This observation implies that the cost of living rose faster than did the retail prices of these products. This conclusion is based on the fact that constant shilling retail prices were

Figure 7·3 : Monthly retail prices of Kimbo and cooking oils.

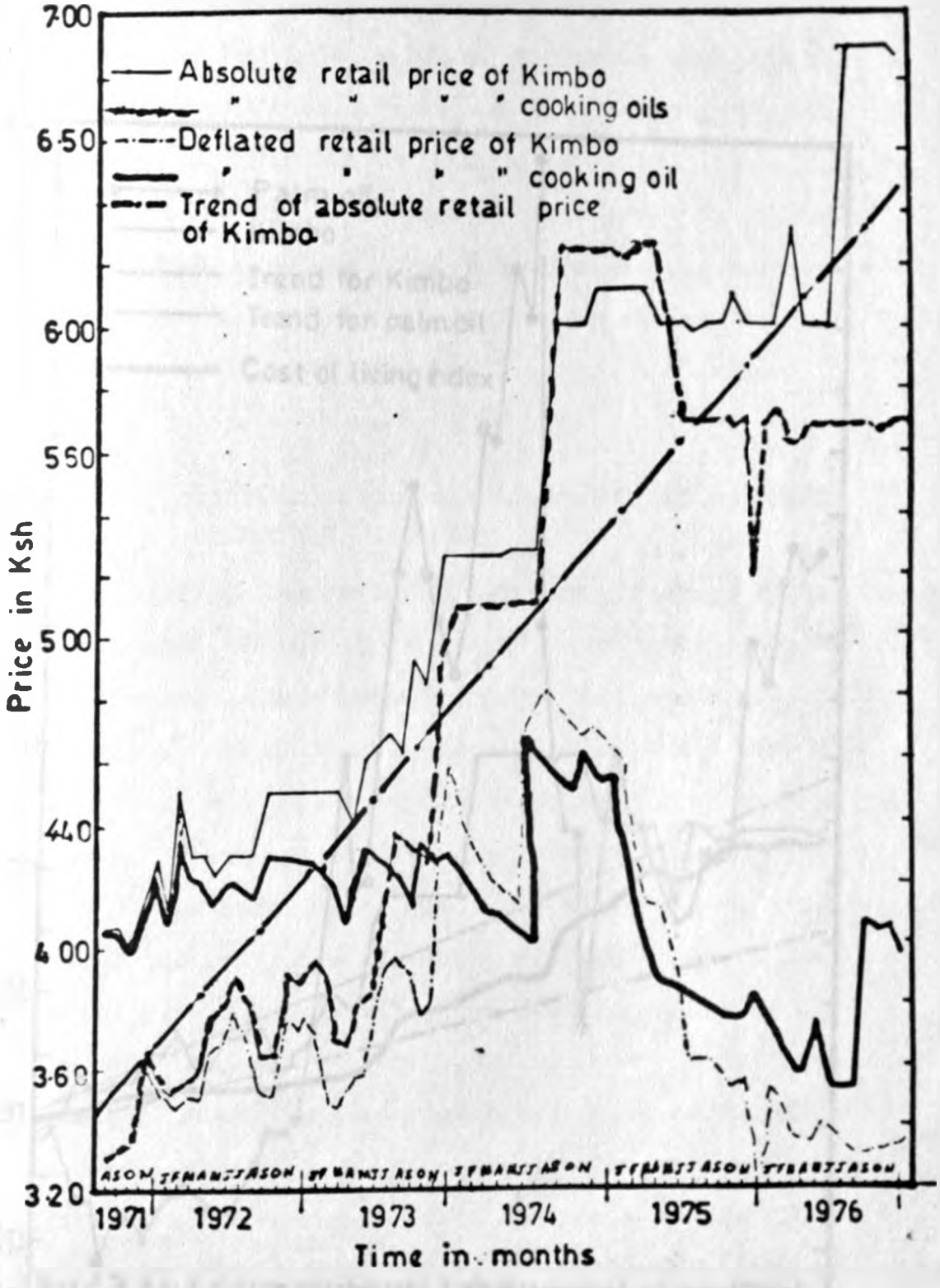
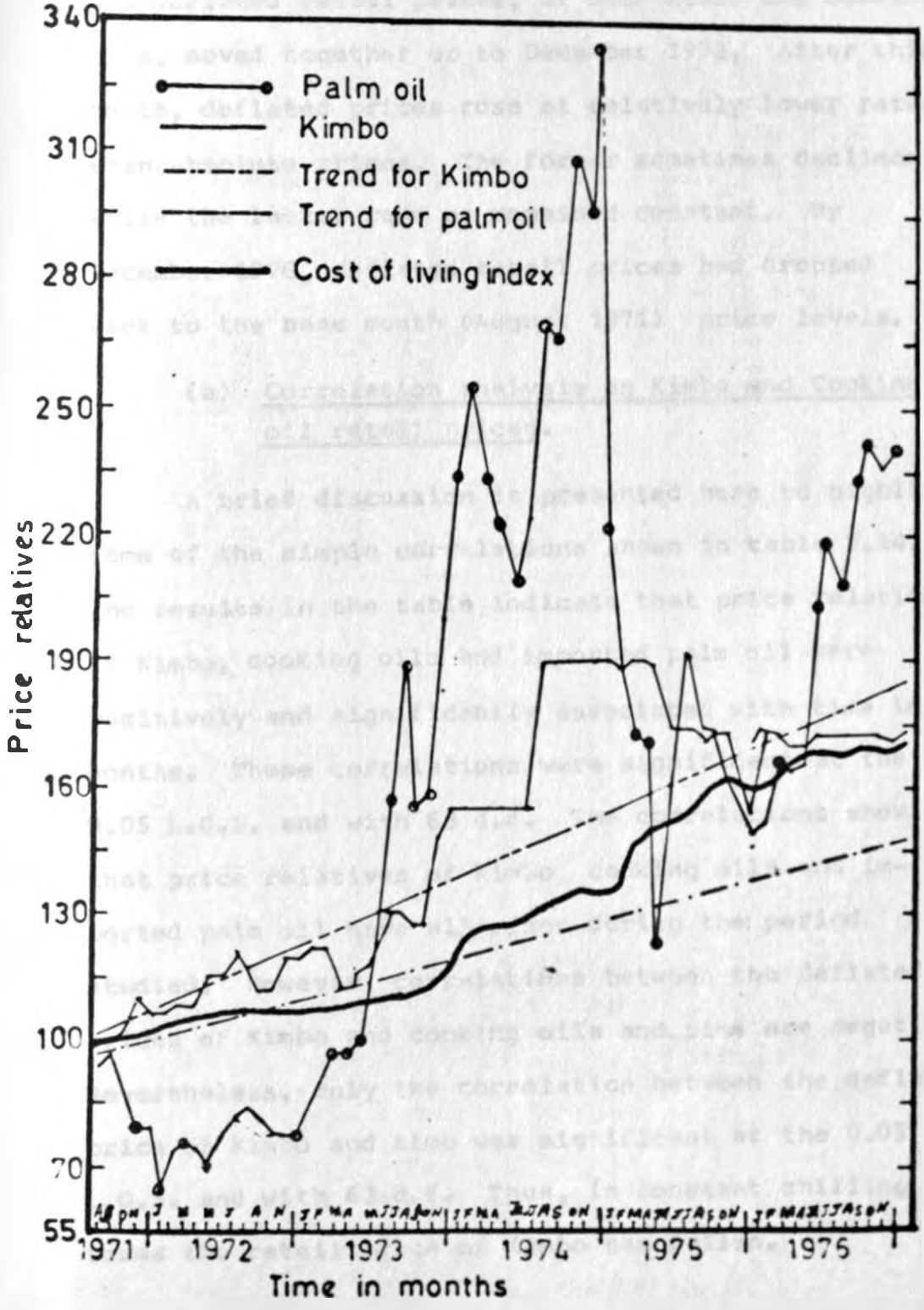


Figure 7·4 : Retail price relative of kimbo, import price relative of palm oil and cost of living index



obtained by deflating absolute retail prices using the cost of living index. Figure 7.3 shows that absolute and deflated retail prices, of both Kimbo and cooking oils, moved together up to December 1973. After this month, deflated prices rose at relatively lower rates than absolute prices. The former sometimes declined while the latter rose or remained constant. By December 1976, deflated retail prices had dropped back to the base month (August 1971) price levels.

(a) Correlation analysis on Kimbo and Cooking oil retail prices.

A brief discussion is presented here to highlight some of the simple correlations shown in table 7.14. The results in the table indicate that price relatives of Kimbo, cooking oils and imported palm oil were positively and significantly associated with time in months. These correlations were significant at the 0.05 L.O.S. and with 63 d.f. The correlations show that price relatives of Kimbo, cooking oils and imported palm oil have all risen during the period studied. However, correlations between the deflated prices of Kimbo and cooking oils and time are negative. Nevertheless, only the correlation between the deflated price of Kimbo and time was significant at the 0.05 L.O.S. and with 63 d.f. Thus, in constant shilling terms the retail price of Kimbo has fallen.

TABLE 7.14: SIMPLE CORRELATION MATRIX - FOR SPECIFIC EDIBLE OILS AND FATS' RETAIL AND IMPORT PRICES

Prices and time variables	Kimbo's retail price relative[1]	Cooking (salad) oils retail price relative[1]	Palm oil import price relative[1]	Retail price of Kimbo in deflated terms[2]	Retail price of cooking oils in deflated terms[2]	Time in months
Kimbo's retail price relative[1]	1.000					
Cooking (salad) oils retail price relative[1]	0.936**	1.000				
Palm oil import price relative[1]	0.792**	0.742**	1.000			
Retail price of Kimbo in deflated terms[2]	0.439	0.176	0.523	1.000		
Retail price of cooking oils indeflated terms[2]	-0.188	-0.302	0.860**	0.702**	1.000	
Time in months	0.871**	0.954	0.671**	-0.009	-0.512**	1.000

1. Price relatives were obtained by dividing the time series prices of each item by its base price (August 1971 price = 100) and multiplying by 100.
2. Deflated prices were obtained by dividing individual item absolute prices by the cost of living index (August 1971 = 100).

** r significant at the 0.05 L.O.S. and with 63 d.f. (Ho: $\rho = 0$).

SOURCE: Based on data in Appendix 12.

The correlation (r=0.936) between the absolute price of Kimbo and absolute price of cooking oils was significant at the 0.05 L.O.S. and with 63 d.f. Also the correlation (r=0.702) between the deflated prices of Kimbo and cooking oils was significant at the 0.05 L.O.S and with 63 d.f. These two correlations show that there is a close association between prices of Kimbo and those of cooking oils. They move together positively.

Other significant correlations are the correlation (r=0.792) between the price relatives of Kimbo and imported palm oil and the correlation (r=0.523) between the deflated price of Kimbo and the price relative of imported palm oil. These correlations are significant at the 0.05 L.O.S. and with 63 d.f. Palm oil is the main ingredient constituting the compound Kimbo fat. These correlation results suggest that there is association between the price of the raw material (palm oil) and the price of its product (Kimbo) as might be expected.

(b) Regression analysis on Kimbo and Cooking oils retail price trends.

Three regression models were formulated and calculations made to determine the trends of retail prices of Kimbo fat and cooking oils between August 1971 and December 1976. Monthly data was used in calculation of trends.

The regression models formulated on the basis of monthly data were the following:

7.3 (a) $P_1 = a_1 + b_1T + e$

7.4 (a) $P_2 = a_2 + b_2T + e$

7.5 (a) $P_3 = a_3 + b_3T + e$

where P_1 = retail price relative of Kimbo,

P_2 = deflated retail price of Kimbo,

P_3 = retail price relative of cooking oils,

T = time in months and

e = error term.

The assumption made about all the three models was that prices rose with time for the period considered. The resultant equations were:

7.3 (b) $P_1 = 101.84 + 1.41^{**}T$ $(R^2 = 0.76 = 76\%)$

7.4 (b) $P_2 = 3.78 + 0.00\ T$ $(R^2 = 0.00 = 0\%)$

7.5 (b) $P_3 = 96.00 + 1.06^{**}T$ $(R^2 = 0.91 = 91\%)$

The price relatives of Kimbo and cooking oils rose with time. The trends of these two prices are shown in figure 7.4, and it can be seen that the price relative of Kimbo rose at a faster rate than the price relative of cooking oils. The regression coefficients for models 1 and 3 were significant at the 0.05 L.O.S. and with 63 d.f. The regression coefficient for model 2 shows that there was no perceptible change in the deflated price of Kimbo for the period studied.

The values of R^2 for models 1 and 3 were quite high. They indicate that the regressions account for large proportions of the corresponding price variations.

7.6.3 Relationship between retail prices of Kimbo fat and prices of its raw material (palm oil).

The major ingredient of Kimbo fat is palm oil. In the previous sub-section, correlation analysis showed that there was a significant correlation between the retail price of Kimbo and the palm oil import price. In this sub-section, further qualitative and quantitative analysis is done to determine the relationship between the Kimbo retail price and the palm oil import price. International palm oil import prices were used in the analysis because domestic palm oil import prices were not available on a monthly basis. In using international palm oil import prices it was assumed that whenever they undergo change, similar change will occur in the domestic palm oil import prices. The international palm oil import prices used were for Malaysian palm oil (c.i.f. London). Malaysian palm oil forms a major part of Kenyan palm oil imports.

Observation of figure 7.4 tends to indicate that retail prices of Kimbo have been responding more quickly to palm oil price rises than to price falls. For instance, the retail price of Kimbo stayed at the

controlled level between November 1974 and May 1975 when the palm oil import price was falling. On the other hand, the retail price of Kimbo rose immediately in October 1973 and in May 1974 when palm oil import price increased. It was only on one occasion, June 1975, that the retail price of Kimbo was lowered after a prolonged (8 months) drop in palm oil import price. The implication of the above observations is that edible fats processors react to raw material price rises immediately (by asking the Government to raise domestic prices of their products) but react to raw material price drops very slowly, if at all.

Although the comments made above with regard to the relationship between the retail price of Kimbo and the import price of Kimbo were considered worthy of mention, they do not depend on regression analysis. A simple linear regression analysis showed that the two prices were positively and significantly related. The simple regression model formulated for this relationship was:

7.6 (a) $P_4 = a_4 + P_{p-1} + e$

where P_4 = retail price relative of Kimbo,

P_{p-1} = imported palm oil price relative, lagged one month, and

e = error term.

The regression equation derived was the following;

7.6 (b) $P_4 = 90.49 + 0.35^{**}P_{p-1}$

The regression coefficient was significant at the 0.05 L.O.S. and with 63 d.f.

Thus, quantitative analysis led to the conclusion that the retail price of Kimbo is positively influenced by the palm oil import price for the period covered in the study. But it should be remembered that this was mostly a period of price increase and, therefore, the determined relationship does not say much about what happens under falling raw material prices.

CHAPTER 8

HYPOTHESIS TESTING

The hypotheses stated in Chapter 3 are tested in this Chapter and, therefore, attempts are made to answer the counterpart questions posed. This part of the study has been left till now because it was essential to compile data from the surveys and conduct the foregoing analyses in order to be able to apply the relevant information for the tests described.

Hypothesis 1: Kenya has the potential to produce economically enough edible vegetable oils and fats to meet domestic demand.

This hypothesis is tested on an import substitution basis. A comparison is made between the costs incurred by edible vegetable oils and fats processors when using imported palm oil or domestically produced sunflowerseed. In order to make the comparison relevant to domestic production of edible oils and fats, it was done on a per hectare basis.

It was shown in section 6.4, using 1976 prices of sunflowerseed, that one hectare of sunflower yielded 0.525 metric ton of sunflowerseed oil at a cost of KShs.1875 to the processor. An equal quantity of palm oil was imported by processors at a cost of KShs.1975.

These results show that substitution of imported palm oil by domestically produced sunflowerseed oil would be economical

Under 1976 prices, maize was more competitive than sunflowerseed in high potential areas where the two crops compete for land. In comparing maize with imported palm oil, the sunflowerseed price equivalent of maize was used because direct comparison was not possible. This was so because oil extraction rate of maize was not available and, furthermore, maize is grown mainly for other purposes than for oil extraction. The maize germ from which corn oil is extracted is a by-product of maize meal and constitutes a small proportion of maize grain.

It was observed that maize produced per hectare was equivalent to sunflowerseed oil worth KShs.2700 (section 6.4). With the cost of palm oil remaining at KShs.1975, the result indicates that it would be uneconomic for processors to substitute sunflowerseed oil for palm oil imports, if the sunflowerseed price equivalent of maize is applied.

The above results lead to the conclusion that it would be economic to substitute imported palm oil (on basis of 1976 prices) by expanding domestic production of sunflowerseeds so long as the expansion and

increased need for land does not mean displacing the maize crop.

Therefore, the hypothesis cannot be rejected but whether it is an optimal strategy depends on land availability. It could be advisable from the point of view of the whole economy and social benefits to grow more sunflower and other oilcrops.

Hypothesis 2: The edible vegetable oils and fats processing plants are located in areas acting as sources of domestic raw materials.

The results of the surveyed firms indicated that 70 per cent of the latter selected plant locations on the basis of proximity to raw material sources. Amongst the remaining firms, 20 per cent based plant location selection on proximity to market for final products while 10 per cent did not respond.

Those firms which based their plant site selection on proximity to market for their final products are mainly the fats processing ones. These firms are mainly dependent on imported palm oil and, therefore, the question of relationship between plant location and domestic raw material sources becomes irrelevant.

Therefore, from the results the hypothesis cannot be rejected when relating to the edible oils processing firms.

Hypothesis 3: There is a high degree of backward, but no forward, vertical integration conducted by processing firms.

The processing firms' survey revealed that only three firms out of sixteen were contracting with farmers for supply of oilseeds. No processing firm was involved directely in farm production of raw materials. Thus, there is only a small degree of backward vertical integration. The first part of the hypothesis is, therefore, rejected.

It was also observed that edible vegetable oils and fats processing firms did not engage in wholesaling or retailing of their products. The firms are dependent on distributors and wholesalers for distribution of their products. However, one fats processing firm has depots in five major distribution points. The results show that there is virtually no forward vertical integration and, consequently, the second part of the hypothesis is not rejected.

Hypothesis 4: The volume of edible vegetable oils and fats imports has been increasing steadily over time[12]

Thus, the hypothesis tested is $H_1 : \beta > 0$

where B is the population regression coefficient of the edible vegetable oils and fats imports trend. The results of regression anlysis for external trade are shown in table 5.3. In testing the hypothesis it is assumed that the 1965-76 period used for the regression analysis defines a representative sample of annual volumes from a population over a longer period. Furthermore, the t-test method was used at the 0.05 L.O.S. and with 10 d.f.

The tabular value of 't' was 2.228 while its calculated value was 1.24. Therefore, the hypothesis (H_1) was rejected in favour of the null hypothesis ($H_o : \beta = 0$).

Hypothesis 5: Margins accruing to edible vegetable oils processors are higher, generally, than those accruing to wholesalers.

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12. The hypothesis could also be tested on basis of the period covered (1965-76) rather than on a long term basis. Under these circumstances, the acceptance or rejection of the hypothesis is based on the direction of the trend, i.e. on the sign of the regression coefficient. The regression coefficient for the trend of vegetable oils imports was 620 metric tons per annum. The figure is positive and indicates that imports have been increasing during the period considered. Thus, the hypothesis cannot be rejected when tested along these lines.

Table 7.5 shows the estimated margins accruing to processors and table 7.6 contains margins accruing to wholesalers. It can be seen that processors' margin range between 5.6 per cent and 31 per cent when returns from oil-cake are excluded. When the latter are included, processors' margins increase and range between 10 per cent and 44 per cent. On the other hand, wholesalers' margins vary between 2.6 per cent and 11 per cent (table 7.6).

Thus the results show that, on average, margins accruing to edible vegetable oils and fats processors are higher than those accruing to wholesalers. The hypothesis, therefore, is not rejected.

Hypothesis 6: The per unit (kg) retail price of edible vegetable oils and fats decreases as pack size increases.

This hypothesis was tested using the retail prices of Kimbo and it is assumed that similar results would be observed for other edible vegetable oils and fats. The regression model formulated for the analysis was:

$$P_u = a - bS_p + e$$

where P_u = per unit retail price (in KShs)

S_p = pack size (in Kgs).

The form of hypothesis tested was $H_1 : \beta < 0$.

The regression equation derived was the following:

$$P_u = 11.00 - 0.26 S_p$$

The hypothesis was tested at the 0.05 L.O.S, with 63 d.f. The tabular value of 't' was 2.030 and its observed value was 1.742.

From this result the hypothesis is rejected in favour of the null hypothesis ($H_o : \beta = 0$).

However, rejection of the hypothesis is made with the following observations:
The difference in packaging material (explained in the text) must have affected the regression coefficient. Also, the fact that the regression coefficient is negative is in accordance with the apriori belief.

Hypothesis 7: Low income consumers prefer small edible fats pack sizes.

Table 7.10 shows that the smallest pack size was the most popular on basis of sales volume for the low-middle income group. The smallest pack size (100 gm) held first position the highest number of times in the low-middle income retail outlets (as explained in the text) while the largest pack size (2 Kg) held the last position (5th) the highest number of times in the same retail outlets.

Conversely, the smallest pack size did not hold first position at all in the middle-high income retail outlets but the largest pack size held first position

the highest number of times in these retail outlets.

- The hypothesis is, therefore, not rejected on the basis of the popularity (as shown by sales volume) of a given pack size.

CHAPTER 9

CONCLUSIONS AND RECOMMENDATIONS

9.1 Main Conclusions

The major conclusions of this study are summarised in this section.

- The observation that vegetable oils and fats are characterised by extensive interchangeability means that technical properties cannot act as constraints in substituttion of imported vegetable oils and fats or their raw materials by domestically produced ones. This observation leads to the conclusion that technical properties of vegetable oils and fats cannot hinder the attainment of a self-sufficiency policy. With the available range on domestically produced edible vegetable oils raw materials, Kenya can satisfy all her various different requirements assuming that she has the potential to produce sufficient quantities of these raw materials.

However, the present domestic production of edible vegetable oils and fats raw materials is quite insufficient Edible oils and fats processors are experiencing raw material shortages due to deficit domestic supply. There are various constraints which seem to hinder expansion and improvement of domestic oilseeds production.

Examples are socio-economic constraints, financial policies biased against oilseeds and lack or improper supply of necessary inputs. While land unavailability can also act as a constraint, it was not possible to assess what hectarage of free land could be available for oilseeds expansion. In addition, further study is needed to see what the opportunity costs would be if oilseeds expansion involved displacement of other crops.

In addition to hectarage expansion, domestic production of vegetable oils can also be increased substantially through improved yields per hectare and through increased oilseeds oilcontent (especially for sunflowerseed). Furthermore, in order to achieve the hectarage expansion objective, it is important that the constraints of unfavourable prices for oilseeds, financial policies biased against oilseeds and inefficient supply of essential inputs are rectified.

Kenya has been a net importer of edible oils and fats throughout the period studied. Regression and correlation analysis indicated that aggregate oilseeds imports have been decreasing but aggregate imports of vegetable oils and fats have been increasing.

The increase in vegetable oils imports has been mainly a result of the increase in palm and palm kernel oils imports used in processing of fats.

- The domestic edible vegetable oils and fats industry consists of vegetable oils processing firms and vegetable fats processing firms as two distinct sectors. The vegetable oils processing sector is characterised by relatively small firms distributed across the country.

The fats processing sector is highly concentrated, consisting of virtually two firms (duopoly condition). These two firms are mainly dependent on imported palm oil as their basic raw material.

Although it was not possible to determine the actual structure of the edible vegetable oils and fats industry in terms of buying and selling concentrations, market shares of various firms and pricing behaviour, a few observations were made. First, the number of firms (16) is such that the industry cannot straightaway be termed as oligopolistic, considering the size of the domestic market which is not so large. On the other hand, the firms are not too many for the industry to be termed perfectly competitive. Second, the advertising and product proliferation behaviour of the large fats processing firm tends to suggest that economies of size are absent in the industry.

The product proliferation and the raising of the average costs curve through advertising act as barriers to entry into the industry and result in a situation which can be regarded as having monopolistic elements.

Vertical integration in the domestic edible vegetable oils and fats industry is small. Only three firms out of sixteen are currently contracting with farmers for supply of raw materials. No processing firm has so far embarked on farm production of raw materials.

Also, firms are not involved in the marketing of their products. Only one giant fats processing firm has depots in major distribution points. Lack of vertical integration coupled with a general lack of affiliations between processors and wholesalers and between wholesalers and retailers tends to suggest that the industry lacks strong competition. The distribution chain consists mainly of wholesalers or distributors who buy from processors and retailers who buy from wholesalers, However, large supermarkets and self-selection stores also buy direct from processors.

- Assessment of the edible vegetable oils and fats industry's efficiency on the basis of production, marketing and wastage costs was not possible due to lack of the relevant data.

However, it was observed that shortages in the supply of edible oils and fats in the domestic market are a common feature. These shortages take two forms. They are exhibited in the form of shortages of products and appropriate pack sizes. In low income retail outlets, shortage of small pack sizes of fats is a frequent and more serious problem than lack of fats.

An estimation of processors' mark-ups indicated that they were generally higher than marketing margins accruing to wholesalers. These high mark-ups may suggest an inefficient pricing system. The study revealed that there was no price competition in the domestic edible vegetable oils and fats industry and that the existence of price control conceals the price leadership of the large firm. Nevertheless, non-price competition is practised by the largest fats processing firm. This firm is involved in vigorous advertising and brand proliferation.

Analysis of retail prices of edible vegetable oils and fats showed that these prices have been rising during the period studied (1971-76). However, when the retail prices were deflated, they were observed not to have changed perceptibly during the 1971-76 period.

Edible oils and fats packaging and presentation methods have greatly improved. Processing firms have adopted the method of packaging oils and fats in containers of various suitable sizes, which ensure that products are not easily spoilt or contaminated. The practice of weighing or measuring oils and fats at retail level are being slowly abandoned.

9.2 Main Recommendations. Policy

- In order to achieve the Government's policy of self-sufficiency in edible vegetable oils and fats the following steps are recommended:

a) The current yields of oilcrops are extremely low and, therefore, an attempt should be made to increase them so as to raise domestic production of edible vegetable oils raw materials.

b) Domestically produced oilseeds are generally of low oilcontent. This means that plant breeding and selection work should be undertaken to produce oilseed varieties with high oilcontent, especially with regard to sunflowerseed. The competitiveness of oilseeds vis a vis other domestically produced crops also needs to be improved through proper pricing and financial support.

c) Where land availability is not a contraint and opportunity costs are not prohibitive, domestic production of oilseeds can be increased through hectarage expansion.

- Participation of the edible vegetable oils and fats processing firms in raw material production should be greatly encouraged. Processors can greatly assist in raw material production improvement and expansion by providing farmers with inputs, especially those inputs acting as constraints for one reason or another, and by assuring them of a ready market for their oilseeds. Processors can recover their costs after farmers have harvested and sold their oilseeds.

- However, the Maize and Produce Board should continue to act as an assembler of oilseeds from small scale farmers and as a buyer of the last resort so as to protect these farmers from exploitation. By acting as a buyer of the last resort, the Board will ensure that farmers do not get prices below a certain minimum even if domestic supply of oilseeds becomes abudandant.

- Palm oil should continue to be imported duty free because domestic production of edible vegetable oils raw material is still too small relative to demand.

As domestic production of raw material increases, palm oil imports should be phased out gradually until domestic production becomes sufficient.

- It is important that a standardisation method be established with regard to edible oils and fats, so that consumers pay prices according to quality of products and processors are penalized for low quality products. Grades and quality specifications should be clearly defined and prices determined accordingly.

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APPENDIX 1: VALUE OF EDIBLE OILS AND FATS EXTERNAL IMPORTS FOR HOME USE (1965-1976)

COMMODITY / YEAR	Coconut (copra) Oil	Palm Oil	Palm Kernel Oil	Linseed Oil	Soyabean Oil	Groundnut (peanut) Oil	Olive Oil	Sun-flower seed Oil	Other fixed vegetable oils n.e.s
1965	4,005.4	10,126.5	141.4	690.5	1.1	2.8	135.7	-	1.4
1966	6.699.4	8,326.3	186.9	457.3	859.2	33.9	254.0	0.6	0.7
1967	3.182.6	3,769.0	704.9	443.0	18.9	3.1	209.9	0.8	10.7
1968	1,144.5	8,381.3	155.5	919.5	1,294.	27.3	321.7	339.2	-
1969	1,995.3	16,442.1	167.4	858.3	6,283.7	22.9	239.2	1,977.6	-
1970	1,460.8	13,035.7	235.9	615.3	1,900.3	-	178.3	-	1.1
1971	2.620.4	29,915.6	174.7	709.8	2,359.1	19.1	317.7	0.2	2.9
1972	-	25.269.1	8.283.2	1,930.1	2,330.7	-	474.3	51.4	10.9
1973	-	38,845.3	3,530.1	1,115.3	3,420.4	0.7	404.1	-	3.3
1974	-	59.784.6	7.555.8	2.235.7	914.4	-	142.5	15.4	-
1975	-	48,105.6	6,031.6	963.8	2,622.0	493.1	366.6	10.8	-
1976	-	9,867.0	118,709.7	1,448.1	3,045.6	3,637.7	290,5	21.6	-

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APPENDIX I: CONTINUED

COMMODITY / YEAR	Ghee Substitute (vegetable Ghee)	Margarine	Other Prepared Ediple fats n.e.s	Oilseeds, Oil nuts and Oil Kernels	VEGETABLE OILS AND FATS SUB-TOTAL	Animal Oils and Fats Incl. Lard and Tallow	GRAND TOTAL
1965	3.5	-	10.4	37.5	15,156.2	15,023.4	30,179.6
1966	1.9	-	14.0	41.8	16,876.0	8,207.0	25,083.0
1967	1.3	-	145.8	43.7	9,533.7	4,668.8	13,202.5
1968	12.3	184.1	33.9	0.1	12,814.0	6,937.8	19,751.8
1969	-	133.4	33.9		28,180.3	11,347.8	39,528.1
1970	0.1	57.4	46.7	3.9	17,535.5	15,697.9	33,233.4
1971	0.1	183.3	53.4	74.8	36,431.1	24,961.1	61,392.2
1972	-	-	25.6	11.4	38,386.0	16,156.5	54,542.5
1973	-	59.6	20.2	14.7	47,413.8	23,221.8	70,635.6
1974	-	-	-	7.1	70,655.5	50,817.6	121,473.1
1975	-	-	-	19.4	58,612.9	72,375.8	130,988.7
1976	-	-	703.8	48.6	137,774.6	40,365.9	178,138.5

SOURCE: East African Community (EAC) Annual Trade Reports.

APPENDIX 2: VALUE OF EDIBLE OILS AND FATS TRANSFERS FROM TANZANIA AND UGANDA TO KENYA (1965 - 1976)

1000 K.Shs.

YEAR / COMMODITY	Fixed cotton seed oil	Fixed palm oil	Fixed coconut (copra) oil	Fixed groundnut oil	Fixed vegetable oils n.e.s	Ghee substitute and other cooking fats	Margarine	Oilseeds	VEGETABLE OILS AND FATS SUB-TOTAL	Animal fats and oils	TRANSFERS GRAND TOTAL
1965	26,721.1	15.8	2,308.2	123.9	68.3	9,225.7	-	2,905.5	41,368.5	420.1	41,788.6
1966	19,378.8	4.0	983.7	31.5	31.9	10,400.3	-	4,756.7	35,586.8	228.8	35,815.6
1967	22,109.3	69.0	368.1	305.0	22.7	15,984.2	-	4,809.1	43,667.4	321.9	43,989.3
1968	22,973.6	6.7	1,243.2	431.4	15.2	13,554.2	429.2	3,367.2	42,010.6	236.3	42,246.9
1969	2,218.4	22.5	1,392.9	180.7	126.2	1,416.1	298.8	4,145.7	9,801.4	201.7	10,003.1
1970	23,561.3	30.2	1,573.5	36.7	69.2	15,449.9	595.9	6,357.5	47,674.3	137.5	47,811.8
1971	18,931.8	10.8	2,252.8	-	23.3	14,315.3	737.4	10.094.1	46,365.5	0.5	46,366.0
1972	9,475.1	18.0	958.8	-	3.6	8,326.1	719.8	5,930.8	25,432.1	1.6	25,433.7
1973	3,676.6	-	785.8	-	-	2,610.0	384.2	10,388.3	17,845.0	-	17,845.0
1974	3,869.2	-	1,208.2	-	-	2,999.3	193.4	19,884.8	28,154.9	0.1	28,155.0
1975	750.0	-	1,335.9	-	-	12.2	-	2,104.0	4,202.1	-	4,202.1
1976	0.2	-	1,275.6	-	-	-	-	183.6	1,459.5	20.2	1,479.6

SOURCE: EAC Annual Trade Reports.

APPENDIX 3: VALUE OF EDIBLE OILS AND FATS EXTERNAL DOMESTIC EXPORT (1965 - 76)

1000 K.Shs.

YEAR \ COMMODITY	coconut (copra) Oil	cotton-seed Oil	other Fixed vegetable Oils n.e.s	vegetable Ghee (Ghee sub-stitute)	marga-rine	other pre-pared edible fats n.e.s	Ground-nuts (peanut) Green whether shelled or not	Sesame seed	Sun-flower seed	other oil-seeds oil-nuts & oil-kernels n.e.s	VEGE-TABLE OILS & FATS TOTAL	Animal oils & Fats inclu-ding Tallow	GRAND TOTAL	(12) as % of (11)
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1965	217.6	110.2	5.3	44.1	-	5.3	2,473.9	739.1	1,368.8	55.3	5,019.6	73.0	5,092.6	1.4%
1966	167.5	71.1	1.9	81.8	-	37.5	1,111.3	2,146.6	1,275.0	64.5	4,958.6	32.5	4,989.9	0.6
1967	73.3	103.2	4.6	159.1	-	44.0	1,193.7	1,128.7	1,637.0	472.0	4,815.6	9.1	4,824.7	0.2
1968	131.5	76.1	6.4	28.6	90.8	1.6	5,015.5	2,077.5	2,753.6	6.5	10,188.1	24.0	10,212.1	0.2
1969	181.6	160.5	1.6	26.4	30.2	18.0	301.7	1,040.8	1,761.9	6.3	3,529.0	14.3	3,543.3	0.4
1970	447.2	248.9	9.5	436.6	40.8	0.9	3,294.4	1,325.5	3,127.3	432.4	9,362.9	14.9	9,377.8	0.2
1971	115.4	433.0	53.0	95.4	64.7	-	2,971.7	2,167.6	2,693.5	0.1	8,594.4	6.8	8,601.2	0.1
1972	75.1	362.3	52.1	164.9	43.5	-	991.7	754.1	2,276.0	4.2	4,723.9	13.0	4,736.9	0.3
1973	404.9	1,737.5	289.1	173.8	31.2	224.2	737.0	1,641.9	4,859.2	186.9	10,460.2	10.8	10,741.0	0.1
1974	12,714.9	149.5	140.2	116.2	28.6	3.3	998.7	-	6,869.9	7.0	21,028.3	146.9	21,175.9	0.7
1975	1,519.0	2,540.2	6,767.3	268.9	46.3	-	301.9	1,001.7	7,767.9	5.7	20,427.4	9.8	20,437.2	0.0
1976	1,519.0	10,203.7	3,137.8	350.1	141.0	1,780.1	248.5	4,085.6	8,807.4	5.1	30,278.3	665.2	30,243.5	2.2

SOURCE: EAC Annual Trade Reports

APPENDIX 4: VALUE OF EDIBLE OILS AND FATS TRANSFERS FROM KENYA TO TANZANIA AND UGANDA (1965 - 76)

1000 K.Shs.

YEAR / COMMODITY	Fixed cotton-seed oil	Fixed palm oil	Fixed coconut (copra) oil	Fixed ground-nut oil	Fixed vegetable oils n.e.s	Ghee substi-tute and other cooking fats	Margarine	Oilseeds	VEGETABLE OILS AND FATS SUB-TOTAL	Animal fats and oils	TRANSFERS GRAND TOTAL
1965	3,208.3	0.4	871.6	-	50.0	1,212.2	-	64.4	5,348.9	132.5	5,539.4
1966	1,962.0	-	641.7	0.1	61.0	1,537.3	-	74.7	4,276.9	85.4	4,362.2
1967	2,040.1	-	882.5	4.6	61.1	1,292.8	-	61.6	4,896.8	87.5	4,984.2
1968	1,129.3	-	2,398.8	-	30.6	1,029.5	1,745.7	1,082.7	7,423.2	306.2	7,722.8
1969	144.2	-	858.1	-	18.4	1,953.8	2,869.5	256.3	6,100.2	448.7	6,548.9
1970	100.8	-	2,327.4	-	51.0	196.0	4,203.8	759.6	7,638.5	511.0	8,149.5
1971	2,522.7	-	3,355.7	-	148.2	276.3	5,578.2	102.9	11,984.3	377.3	12,361.6
1972	28.9	-	7,484.9	-	22.0	792.0	6,419.6	42.3	14,789.7	253.4	15,043.1
1973	12.5	49.6	7,420.4	-	0.5	1,293.9	7,808.3	5.9	16,591.1	10.1	16,601.2
1974	0.1	-	6,799.0	-	59.2	1,764.6	7,210.3	7.4	15,840.6	87.2	15,927.8
1975	2.1	-	3,237.3	-	22.8	1,014.9	703.0	-	4,980.2	4,548.9	6,529.1
1976	83.4	-	388.2	-	26.2	2,564.2	2,083.2	1.9	5,147.2	38.9	5,186.1

SOURCE: EAC Annual Trade Reports.

APPENDIX 5: QUANTITY OF EDIBLE OILS AND FATS EXTERNAL IMPORTS FOR HOME USE (1965 - 1976)

COMMODITY / YEAR	Coconut (copra) Oil	Palm Oil	Palm Kernel Oil	Linseed Oil	Soyabean Oil	Vegetable Fixed Oils n.e.s	Vegetable Ghee + Margarine + Other prepared fats	EDIBLE OILS AND FATS SUB-TOTAL	Animal Oils and fats	TOTAL OILS AND FATS	Oilseeds Oil kernel and oil nuts
1965	1,598.3	4,693.3	45.3	271.1	0.4	18.3	63.3	6,690.0	8,336.1	15,026.1	33.8
1966	3,140.2	4,431.2	71.7	185.8	282.2	43.7	87.8	8,242.5	4,828.0	13,070.5	42.7
1967	1,541.8	2,155.7	347.8	180.4	6.2	30.9	47.6	4,310.4	3,582.5	7,892.9	44.9
1968	457.4	1,734.2	46.4	358.2	536.4	250.6	87.0	3,470.2	5,531.2	9,001.4	7.3
1969	904.9	12,085.3	46.7	341.6	3,561.8	1,216.5	62.3	18,219.1	8,519.3	26,738.4	13.6
1970	557.9	6,848.5	85.4	235.7	590.7	22.5	34.9	8,375.6	3,642.1	12,018.7	1.0
1971	1,048.7	15,455.3	38.5	261.7	623.9	44.5	69.8	17,542.4	5,990.8	23,533.2	33.0
1972	-	14,834.5	4,032.4	844.6	804.7	64.3	5.1	20,585.6	3,819.9	24,405.5	6.0
1973	-	15,704.1	1,377.8	375.1	1,330.8	38.3	22.3	18,848.4	4,199.7	23,048.1	5.0
1974	-	13,759.3	1,000.0	376.6	191.4	20.0	-	15,347.3	5,513.0	20,860.3	1.0
1975	5.0	11,413.7	1,318.8	103.0	306.9	65.9	-	13,213.3	9,157.0	22,370.3	13.0
1976	1,249.1	12,404.8	31,766.2	187.4	467.2	363.3	82.9	36,520.9	5,035.3	41,570.2	14.0

APPENDIX 6: QUANTITY OF EDIBLE OILS AND FATS TRANSFERS TO KENYA FROM TANZANIA AND UGANDA (1965 - 1976)

METRIC TONS

COMMODITY / YEAR	Fixed coconut (copra) oil	Fixed cotton seed Oil	Fixed Vege-table Oils n.e.s	Ghee sub-stitutes & other cooking fats	Marga-rine	VEGE-TABLE OILS AND FATS TOTAL	cotton-seed	ground-nuts	sesame seed	sun-flower seed	other oil-seeds, Oil nuts Oil Kernels n.es	TOTAL OIL-SEEDS	Animal Oils and Fats	TOTAL OILS AND FATS (6+13)
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1965	919.8	10.289.0	81.5	2,441.4	-	13,731.7	37.170.0	6,208.0	1,424.0	-	20,150.0	64,952	239.6	13,971.3
1966	482.2	7,796.4	23.8	2,773.4	-	11,075.8	91,130.0	3,988.0	994.0	361.0	32,672.0	129,146	131.8	11,207.6
1967	175.3	9.507.5	179.7	4,311.8	-	14,174.3	94,558.0	5,272.0	5,702.0	18.0	30,636.0	136.186	182.7	14,357.0
1968	495.6	7,607.7	155.5	3,592.3	115.5	11,966.6	1,862.0	486.0	548.0	36.0	924.0	3,856	130.5	13,097.1
1969	649.3	3,536.4	113.7	3,163.2	93.4	7,556.0	4,340.0	160.0	98.0	146.0	1,200.0	5,944	3.4	7,559.4
1970	682.8	8,406.4	52.4	3,972.9	160.1	13,274.6	8,371.0	3.0	173.0	80.0	2,252.0	10,879	46.8	13,321.4
1971	822.0	5,441.2	11.1	3,478.0	182.5	9,934.8	8,044.0	-	189.0	1,012.0	3,268.0	12,513	0.3	9,935.1
1972	351.3	2,225.2	17.8	1,814.9	168.4	4,577.6	2,633.0	320.0	1.0	2,043.0	14,189.0	19,186	1.3	4,578.9
1973	2,548.7	947.2	-	579.4	81.0	4,156.3	6,340.0	207.0	125.0	2,248.0	2,241.0	11,154	-	4,156.3
1974	3,107.1	533.1	-	554.0	30.0	4,224.2	16,573.0	-	200.0	3,596.0	404.0	20,773	-	4,224.2
1975	285.5	108.0	--	1.5	-	395.0	591.0	-	300.0	18.9	366.0	1,275	-	395.0
1976	218.8	-	-	-	-	218.8	-	-	0.8	2.0	26.5	29	4.9	2,218.8

SOURCE: E.A.C. Annual Trade Reports

APPENDIX 7: QUANTITY OF EDIBLE OILS AND FATS EXTERNAL DOMESTIC EXPORTS

METRIC TONS

COMMODITY / YEAR	coconut (copra) oil	cotton-seed oil	other fixed vegetable oils,	vegetable Ghee+ margarine + other prepared fats n.e.s	Sub-total of vegetable oils and fats	Animal oils and fats	TOTAL Edible oils & and fats	Ground-nuts (peanuts)	Sesame seed	Sunflower seed	Other oilseeds oilnuts oilkernels n.e.s.	Total oilseeds
1965	80.0	37.0	2.9	21.9	141.8	25.4	167.2	26,238	11,188	27,656	2,041	67,124
1966	73.8	21.1	0.6	27.0	122.5	12.1	134.6	12,237	28,820	22,097	2,374	65,529
1967	32.5	32.2	2.5	51.5	118.7	4.3	123.0	15,749	14,325	24,396	9,379	63,849
1968	54.4	23.2	1.3	23.4	202.3	8.1	110.4	2,404	1,345	2,446	1	6,196
1969	88.0	42.4	0.3	15.3	146.0	6.1	152.1	132	624	1,836	2	2,593
1970	212.0	75.3	2.2	92.1	381.6	4.0	385.6	1,486	787	3,164	32	5,469
1971	49.8	106.8	51.6	48.1	256.3	1.4	257.7	1,731	1,047	2,229	-	5,007
1972	30.1	70.6	15.6	47.3	163.6	3.0	166.6	485	368	1,794	2	2,649
1973	106.6	383.6	85.4	79.4	665.0	3.8	668.8	336	764	2,781	382	4,263
1974	2,936.7	17.9	24.2	16.5	2,995.3	15.7	3,011.0	320	-	2,848	3	3,171
1975	291.3	2,951.1	757.7	36.0	3,744.8	1.7	3,746.5	196	281	3,225	298	4,000
1976	199.3	1,167.0	375.6	407.3	2,149.2	28.6	2,177.8	278	1,227	2,678	1	4,184

SOURCE: EAC Annual Trade Reports

APPENDIX 8: QUANTITY OF EDIBLE OILS AND FATS TRANSFERS FROM KENYA TO TANZANIA AND UGANDA

METRIC TONS

COMMODITY / YEAR	Fixed Coconut (copra) Oil	Fixed cotton-seed Oil	Fixed vegetable Oils n.e.s.	Ghee substitute & other cooking Fats	Margarine	VEGETABLE OILS AND FATS TOTAL	Animal Oils and Fats	Total Edible Oils and Fats	Groundnuts	Sesame seed	Sunflower seed	Other Oilseeds Oilnuts Oilkernels n.e.s	TOTAL OILSEEDS
1965	329.5	1,069.5	14.3	335.5	-	1,748.7	47.1	1,795.8	502	46	40	234	822
1966	280.7	765.9	20.6	405.8	-	1,473.0	24.2	1,497.2	454	48	268	122	892
1967	389.1	838.4	21.3	347.6	-	1,596.4	22.6	1,619.0	7,146	30	1,562	150	8,888
1968	1,049.7	352.4	11.0	283.4	364.3	2,057.4	105.6	2,163.0	370	-	240	24	634
1969	428.1	45.4	5.6	545.8	637.3	1,662.2	218.9	1,881.1	36	-	56	234	326
1970	1,016.8	37.2	17.7	36.5	970.3	2,078.5	248.7	2,327.2	239	-	-	4	243
1971	1,122.0	570.2	35.2	53.2	1,069.8	2,850.4	141.2	2,991.6	-	-	4	37	41
1972	2,528.1	7.2	-	129.2	1,032.8	3,702.5	87.2	3,789.7	-	-	-	22	22
1973	2,196.1	1.7	18.0	209.2	1,141.1	3,566.1	6.9	3,573.0	-	-	14	7	21
1974	883.1	-	3.1	176.6	773.6	1,836.4	10.8	1,847.2	-	1	-	2	3
1975	438.2	0.2	2.0	80.1	69.5	588.6	291.5	880.1	-	-	-	-	-
1976	59.5	11.2	1.9	205.4	197.2	475.2	14.6	489.8	-	-	-	-	-

SOURCE: EAC Annual Trade Reports

APPENDIX 9: AGGREGATE EDIBLE OILS AND FATS EXTERNAL TRADE BY VALUE (1000 K.Shs) 1965-76

YEAR / COMMODITY	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976
1. Vegetable Oils and fats imports	15,156	16,876	9,534	12,814	28,180	17,535	36,431	38,386	47,414	70,656	58,613	137,776
2. All edible oils and fats imports	30,180	25,083	13,202	19,752	39,528	33,233	61,392	54,543	70,636	121,473	130,989	178,138
3. Vegetable oils and fats transfer to Kenya	41,368	35,587	43,667	42,011	9,801	47,674	46,366	25,432	17,845	28,155	4,202	1,459
4. All edible oils and fats transfer to Kenya	41,789	35,816	43,989	42,247	10,003	47,812	46,366	25,434	17,845	28,155	4,202	1,480
5. Vegetable oils and fats aggregate imports (1 + 3)	56,524	52,463	53,201	54,825	37,981	65,209	82,797	63,818	65,259	98,811	62,815	139,235

APPENDIX 9: CONTINUED.

6. All edible oils and fats aggregate imports (2+4)	71,969	60,899	57,191	61,999	49,531	81,045	107,758	79,977	88,481	149,628	135,191	179,618
7. 5) as % of 6)	75.5%	86.1%	93.0%	88.4%	76.7%	80.5%	76.8%	79.8%	73.7%	66.0%	46.5%	77.5%
8. Vegetable oils and fats exports	5,020	4,958	4,816	10,188	3,529	9,363	8,594	4,724	10,460	21,028	20,427	30,278
9. All oils and fats exports	5,093	4,990	4,825	10,212	3,543	9,378	8,601	4,737	10,471	21,175	20,437	30,945
10. Vegetable oils and fats transfers from Kenya	5,349	4,277	4,897	7,423	6,100	7,639	11,984	14,790	16,591	15,841	4,980	5,147
11. Total oils and fats transfers from Kenya	5,539	4,362	4,984	7,723	6,549	8,149	12,362	15,043	16,601	15,928	6,529	5,186
12. Vegetable oils and fats aggregate exports (8+10)	10,369	9,235	9,713	17,611	9,629	17,002	20,578	19,514	27,051	36,869	25,407	35,425

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APPENDIX 9: CONTINUED:

13. Total oils and fats aggregate exports (9 + 11)	10,632	9,352	9,809	17,935	10,092	17,527	20,963	19,780	27,072	37,103	26,966	36,131
14. 12) as % of 13)	97.5%	98.7%	99.0%	98.2%	95.4%	97.0%	98.2%	98.6%	99.9%	99.4%	94.2%	98.0
15. Vegetable oils and fats net imports (5) - (12)	46,155	43,228	43,488	37,214	28,342	48,207	62,219	44,304	38,208	61,942	37,408	103,810
16. Total oils and fats net imports (6) - (13)	61,337	51,547	47,382	44,064	39,439	63,518	86,197	60,197	61,409	112,525	108,225	143,487
17. (15) as %(16)	75.2%	83.9%	91.8%	84.4%	71.9%	75.9%	71.7%	73.6%	62.2%	55.0%	34.6%	72.3%
18. 13) as % of 6)	14.8%	15.4%	17.1%	28.9%	20.4%	21.6%	19.4%	24.7%	30.6%	24.8%	19.9%	20.1%

SOURCE: Derived from Appendix 1 to 8.

APPENDIX 10: EDIBLE OILS AND FATS EXTERNAL TRADE AND TRANSFERS (1965 - 76)

METRIC TONS

COMMODITY / YEAR	Vegetable oils and fats external imports	Total oils and fats external imports	Oilseeds, oil-nuts and oil Kernel imports	Vegetable Oils and fats transfers to Kenya	Total Oils and fats transfers to Kenya	Oilseeds, Oil-nuts etc. transfers to Kenya	Aggregate vegetable Oils and Fats imports	Aggregate of all Oils and fats imports	Aggregate oilseeds imports	Vegetable oils and fats external exports	TOTAL oils and fats external exports
1965	6,690	15,026	34	13,732	13,971	64,952	20,422	28,997	64,986	142	167
1966	8,243	13,071	43	11,076	11,208	129,146	19,319	24,279	129,189	123	136
1967	4,310	7,893	45	14,174	14,357	136,186	18,484	22,250	136,231	119	123
1968	3,470	9,001	7	11,967	12,097	3,856	15,473	21,098	3,863	109	110
1969	18,219	26,738	14	7,556	7,559	5,944	25,775	34,297	5,958	146	152
1970	8,376	12,019	1	13,275	13,321	10,879	21,651	25,340	10,880	383	386
1971	17,542	23,533	33	9,935	9,935	12,513	27,477	33,368	12,546	256	258
1972	20,586	24,406	6	4,578	4,579	19,186	25,164	28,985	19,192	164	167
1973	18,848	23,048	5	4,156	4,156	11,154	23,004	27,204	11,159	665	667
[redacted]		20,860	1	4,224	4,224	20,773	19,567	25,084	20,774	2,995	3,011
			13	395	395	1,275	13,608	22,765	1,288	3,745	3,747
					219	29	36,740	41,789	43	2,149	2,178

APPENDIX 10: CONTINUED.

COMMODITY / YEAR	Oilseeds external exports	Vegetable oils and fats transfer from Kenya	Total oils and fats transfer from Kenya	Oilseeds etc. transfer from Kenya	Aggregate vegetable oils and fats exports	Aggregate oils and fats exports	Aggregate oilseeds exports	Vegetable oils and fats net imports	All oils and fats net imports	Oilseeds, nuts, etc. net imports	All imports, including oilseeds oil equivalent.
1965	67,124	1,749	1,796	822	1,891	1,963	67,946	18,531	27,034	-2,960	37,998
1966	65,529	1,473	1,497	892	1,596	1,632	66,421	17,723	22,647	62,768	40,596
1967	63,849	1,596	1,619	8,888	1,715	1,742	72,737	16,769	20,508	63,494	43,424
1968	6,196	2,057	2,163	634	2,159	2,273	6,830	13,314	18,825	-2,967	21,916
1969	2,593	1,662	1,881	326	1,708	2,033	2,919	24,067	32,264	3,039	35,281
1970	5,469	2,079	2,327	243	2,461	2,713	5,712	19,190	22,627	5,168	27,048
1971	5,007	2,850	2,992	41	3,106	3,250	5,048	24,371	30,218	7,498	35,154
1972	2,649	3,703	3,790	22	3,867	3,957	2,671	21,297	25,028	16,528	32,767
1973	4,263	3,566	3,573	21	4,231	4,242	4,284	18,773	22,962	6,875	29,108
1974	3,171	1,836	1,847	3	4,831	4,858	3,174	14,736	20,226	17,600	28,929
1975	4,000	588	880	-	4,333	4,627	4,000	9,275	18,138	-2,712	22,998
1976	4,184	475	490	-	2,624	2,668	4,184	34,116	39,121	-4,141	41,796

SOURCE: E.A.C. Annual Trade Reports.

APPENDIX 11: MIDDLE INCOME INDEX OF CONSUMER PRICES

NAIROBI (Base: August, 1971 = 100)

GROUP	Food	Drinks and Tobacco	Fuel, Light and Water	Personal care and Health	Recreation and entertainment	Transport	Furniture and utensils	House hold operation	Clothing and footwear	School fees	Rent	All groups
WEIGHT / MONTH	412	44	50	23	13	65	26	23	51	69	224	1,000
1971 - Dec.	100.8	102.0	100.3	99.9	101.0	100.1	103.0	102.0	100.0	100.0	100.5	100.8
1972 - Dec.	103.7	104.2	113.7	100.5	105.0	105.9	103.5	104.0	105.1	100.0	107.5	105.0
1973 - Dec.	114.4	104.2	118.3	107.8	111.1	121.6	130.7	110.3	132.4	100.0	131.0	118.4
1974 - Dec.	136.4	116.1	131.8	150.2	129.7	149.4	189.7	139.3	170.5	84.3	131.0	134.7
1975 - Mar.	159.0	120.2	137.8	151.0	132.3	178.9	194.4	142.8	176.5	129.3	131.0	150.1
Dec.	162.1	130.6	252.0	267.4	142.6	190.2	213.9	135.4	185.4	129.3	153.7	159.6
1976 Jan.	166.1	130.6	151.3	167.4	142.6	190.2	213.9	135.0	185.4	129.3	156.3	161.9
Feb.	166.8	130.6	176.0	167.5	142.6	190.2	213.9	139.5	185.4	129.3	158.8	164.1
Mar.	166.3	130.6	180.7	167.5	142.6	227.1	235.5	142.2	185.4	129.3	161.3	167.6
Apr.	166.1	138.5	183.4	167.6	142.6	227.1	235.5	143.0	185.4	129.3	161.3	168.1
May.	167.2	138.5	184.4	169.4	142.6	227.1	235.5	143.1	185.4	129.3	161.3	168.6
Jun.	166.5	138.5	183.4	169.5	142.6	228.0	252.9	142.6	187.1	129.3	161.3	168.9
Jul.	166.9	143.5	183.4	169.4	142.6	237.6	252.9	142.5	187.1	129.3	161.3	169.9
Aug.	166.9	143.5	183.4	169.4	142.6	237.6	253.9	142.8	187.1	129.3	161.3	169.9
Sep.	166.8	143.5	183.4	169.4	146.6	238.3	256.9	149.2	190.8	129.3	161.3	170.3
Oct.	167.9	143.5	184.1	169.7	146.6	238.3	256.4	148.0	190.8	129.3	161.3	170.9
Nov.	167.9	143.5	184.4	169.7	146.6	238.3	256.4	148.0	190.8	129.3	161.3	170.0
Dec.	168.3	143.5	185.1	169.3	151.0	238.3	256,7	149.1	190.8	129.3	161.3	171.1

SOURCE: Statistical Abstract of Kenya, 1976.

APPENDIX 12: PRICES AND MIDDLE INCOME

Month		Observed Kimbo retail prices[1] Shs/ 500 gm	Kimbo deflated retail prices	Kimbo retail price relative Aug.1971 = 100	Observed cooking oils retail prices[1]
1		2	3	4	5
1971					
Jul.		-	-	-	-
Aug.	1	3.31	3.31	100.0	4.06
Sep.	2	3.32	3.32	100.3	4.06
Oct.	3	3.34	3.33	100.9	4.00
Nov.	4	3.64	3.62	110.0	4.13
Dec.	5	3.54	3.51	107.0	4.28
1972					
Jan.	6	3.53	3.49	106.7	4.13
Feb.	7	3.56	3.51	107.6	4.50
Mar.	8	3.58	3.51	108.2	4.33
Apr.	9	3.76	3.66	113.6	4.33
May	10	3.78	3.67	114.2	4.25
Jun.	11	3.90	3.78	117.8	4.33
Jul.	12	3.82	3.70	115.4	4.33
Aug.	13	3.64	3.51	110.0	4.33
Sep.	14	3.64	3.50	110.0	4.50
Oct.	15	3.91	3.75	118.1	4.50
Nov.	16	3.89	3.72	117.5	4.50
Dec.	17	3.95	3.76	119.3	4.50

INDEX OF CONSUMER PRICES

Cooking oils deflated retail price	Cooking oils price relative Aug.1971 = 100	Cost of living index[1] Aug.1971 = 100	Palm oil import price[2]	Palm oil oil price Relative Aug. 1971 = 100
6	7	8	9	10
-	-	-	112	95.8
4.06	100.0	100.0	117.	100.0
4.06	100.0	100.1	111	94.9
3.99	98.5	100.3	104	88.9
4.11	101.7	100.5	101	86.4
4.25	105.4	100.8	94	80.4
4.09	101.7	101.1	93	79.5
4.43	110.8	101.5	74	63.3
4.25	106.7	101.9	85	72.7
4.22	106.7	102.7	88	75.3
4.13	104.7	102.9	88	75.3
4.20	106.7	103.1	83	71.0
4.19	106.7	103.3	89	76.1
4.18	106.7	103.6	91	77.8
4.32	110.8	104.1	93	79.5
4.31	110.8	104.4	95	81.2
4.30	110.8	104.7	94	80.2
4.29	110.8	105.0	92	78.7

APPENDIX 12: CONTINUED

1	2	3	4	5
1973				
Jan. 18	3.93	3.73	118.7	4.50
Feb. 19	3.69	3.49	111.5	4.50
Mar. 20	3.68	3.46	111.2	4.50
Apr. 21	3.80	3.54	114.8	4.38
May. 22	3.84	3.56	116.0	4,60
Jun. 23	4.26	3.89	128.7	4.65
Jul. 24	4.35	3.92	131.4	4.68
Aug. 25	4.35	3.87	131.4	4.62
Sep. 26	4.30	3.77	129.9	4.92
Oct. 27	4.32	3.78	130.5	4.86
Nov. 28	4.92	4.28	148.6	5.25
Dec. 29	5.10	4.31	154.1	5.25
1974				
Jan 30	5.10	4.25	154.1	5.25
Feb. 31	5.10	4.15	154.1	5.25
Mar. 32	5.10	4.09	154.1	5.25
Apr. 33	5.10	4.06	154.1	5.25
May. 34	5.10	4.04	154.1	5.25
Jun. 35	5.10	4.00	154.1	5.25
Jul. 36	5.99	4.66	181.0	6.00
Aug. 37	6.25	4.79	188.8	6.00
Sep. 38	6.25	4.69	188.8	6.00
Oct. 39	6.25	4.67	188.8	6.00
Nov. 40	6.25	4.68	188.8	6.12
Dec. 41	6.25	4.64	188.8	6.12

6	7	8	9	10
4.27	110.8	105.3	92	78.7
4.25	110.8	105.8	115	98.3
4.23	110.8	106.4	115	98.3
4.09	107.9	107.2	116	99.2
4.26	113.3	108.0	131	112.0
4.25	114.5	109.5	144	123.1
4.22	115.3	110.0	185	158.2
4.11	113.8	112.5	219	187.2
4.32	121.2	114.0	-	170.9
4.25	119.7	114.3	182	155.6
4.57	129.3	114.9	184	157.3
4.43	129.3	118.4	206	176.1
4.37	129.3	120.0	273	233.3
4.28	129.3	122.8	298	254.7
4.21	129.3	124.8	270	230.8
4.18	129.3	125.7	260	222.2
4.16	129.3	126.2	247	211.1
4.21	129.3	127.8	256	218.8
4.67	147.8	128.5	267	228.2
4.60	147.8	130.5	317	270.9
4.50	147.8	133.4	312	266.7
4.49	147.3	133.7	359	306.9
4.58	150.7	133.6	345	294.9
4.54	150.7	134.7	292	335.0

...../3.

APPENDIX 12: CONTINUED

1975										
Jan. 42	6.22	4.61	187.9	6.12	4.54	150.7	134.9	255	218.0
Feb. 43	6.25	4.35	188.8	6.12	4.26	150.7	143.6	215	183.8
Mar. 44	6.25	4.16	188.8	6.12	4.08	150.7	150.1	198	169.2
Apr. 45	6.22	4.14	187.9	6.12	4.07	150.7	150.3	195	166.7
May. 46	6.17	4.00	186.4	6.00	3.89	147.8	155.2	180	153.9
Jun. 47	5.70	4.66	172.2	6.00	3.86	147.8	155.6	146	124.8
Jul. 48	5.70	4.64	172.2	5.98	3.82	147.3	156.7	187	159.8
Aug. 49	5.70	4.61	172.2	6.00	3.80	147.8	157.8	223	190.6
Sep. 50	5.70	4.58	172.2	6.00	3.77	147.8	159.1	204	174.4
Oct. 51	5.68	3.55	171.6	6.00	3.75	147.8	160.0	203	173.5
Nov. 52	5.70	3.57	172.2	6.00	3.75	147.8	159.8	190	162.4
Dec. 53	5.18	3.25	156.5	6.10	3.82	150.3	159.6	185	158.1
1976									
Jan. 54	5.68	3.51	171.6	6.00	3.71	147.8	161.9	178	152.1
Feb. 55	5.70	3.47	172.2	6.00	3.66	147.8	164.1	181	154.7
Mar. 56	5.64	3.37	170.4	6.00	3.58	147.8	167.6	195	166.7
Apr. 57	5.62	3.34	169.8	6.00	3.57	147.8	168.1	192	164.1
May. 58	5.70	3.38	172.2	6.31	3.74	155.4	168.6	194	165.8
Jun. 59	5.70	3.37	172.2	6.00	3.55	147.8	168.9	233	199.2
Jul. 60	5.70	3.35	172.2	6.00	3.53	147.8	169.9	256	218.8
Aug. 61	5.70	3.35	172.2	6.00	3.53	148.8	169.9	242	206.8
Sep. 62	5.70	3.35	172.2	6.90	4.05	170.0	170.3	272	232.5
Oct. 63	5.67	3.32	171.3	6.90	4.04	170.0	170.9	-	236.8
Nov. 64	5.67	3.32	171.3	6.90	4.04	170.0	170.9	282	241.0
Dec. 65	5.70	3.33	172.2	6.80	3.97	167.5	171.1	274	234.2

SOURCES 1: Statistical Abstract of Kenya (1971 - 76)

2: UN Monthly Bulletin of Statistics - 1971 to May 1977.

APPENDIX 13: AGGREGATE OILSEEDS[1] IMPORTS AND EXPORTS (1965 - 76)

METRIC TONS

	IMPORTS					EXPORTS				
OILSEED / YEAR	Cotton-	Ground-nuts	Sesame	Sunflower seed	Other oil-seeds, oil nuts, etc. n.e.s	cotton-seed	ground-nuts	sesame	sunflower seed	Other oil seeds, oil nuts, etc. n.e.s.
1965	37,170	6,213	1,454	-	2980	10	26741	11234	27696	13
1966	91,130	3,988	1,218	361	2884	2	12691	28869	2237	120
1967	94,558	5,272	5,702	18	12,864	8854	22895	14355	25958	146
1968	1,862	486	548	36	547	-	2774	1345	2686	24
1969	4,340	160	98	146	908	-	168	624	1892	233
1970	8,371	3	173	80	1718	-	1725	787	3164	4
1971	8,044	-	189	1,012	199	-	1731	1047	2233	37
1972	2,633	320	1	2,043	12,797	-	485	368	1794	22
1973	6,340	207	125	2,248	198	190	336	764	2795	7
1974	16,573	-	200	3,596	50	-	320	1	2848	2
1975	591	-	300	18	13	298	196	281	3225	-
1976	-	-	1	2	40	-	278	1227	2678	-

1.- excludes copra because it is mainly imported for extraction of industrial copra oil used by soap manufacturing firms.

SOURCE: Derived from Appendixes 5,6,7 and 8 (E.A.C. Annual Trade Reports - 1965-76)

APPENDIX 14: OIL EQUIVALENT OF OILSEEDS IMPORTS AND EXPORTS

METRIC TONS

	IMPORTS						EXPORTS					
OIL-SEED / EXTRC-RATE / YEAR	cotton-seed	ground-nuts	Sesame seed	Sun-flower	other oil seeds oil nuts etc. n.e.s	Total oil equivalent	ground-nuts	Sesame	sun-flower seed	other oil seeds, oilnuts etc.n.e.s	cotton seed	Total oil equivalent
	15%	35%	45%	35%	20%		35%	45%	35%	20%	15%	
1965	5576	2175	654	-	596	9001	9359	5055	9694	3	2	24113
1966	13670	1396	548	126	577	16317	4449	12991	783	24	0	18240
1967	14184	1845	2566	6	2573	21174	8013	6460	9085	29	1328	24915
1968	279	170	247	13	109	818	971	605	940	5	-	2521
1969	651	56	44	51	182	984	59	281	662	47	-	1049
1970	1256	1	78	29	344	1708	604	354	1107	1	-	2066
1971	1207	-	85	354	40	1686	606	471	782	7	-	1866
1972	395	112	1	715	2559	3782	170	166	628	4	-	968
1973	951	72	56	787	40	1906	118	344	978	1	29	1470
1974	2486	-	90	1259	10	3845	112	1	997	0	-	1110
1975	89	-	135	6	3	233	69	126	1129	-	45	1324
1976	-	-	1	1	8	10	97	552	937	-	-	1586

SOURCE: Derived from Appendix 13.

APPENDIX 15: DOMESTIC CONSUMPTION* OF EDIBLE VEGETABLE OILS AND FATS (1972 - 76)

Metric Tons

YEAR	1972	1973	1974	1975	1976
1. Domestic production of ghees and fats[1]	15,037	13,042	16,242	18,390	22,052
2. Domestic production of Margarine[1]	3,008	3,358	3,704	3,117	3,901
3. Domestic production of edible oils[1]	2,546	2,894	2,866	4,764	4,431
4. Total domestic production of edible vegetable oils & fats	20,591	19,294	22,812	26,271	30,384
5. Aggregate vegetable oils & fats imports[2]	10.069	7.828	8.653	1.108	2.579
6. Aggregate of all oils and fats imports[2]	13,890	12,028	14,170	10.265	7,628
7. (4 + 5)	30,660	27,122	31,465	27,378	32,963
8. Aggregate vegetable oils & fats exports[2]	4,835	5,701	5,941	5,654	4,210
9. Aggregate of all oils and fats exports[2]	4,925	5,712	5,968	5,951	4,254
10. Apparent domestic consumption of vegetable oils and fats	25,825	21,421	25,524	21,721	28,753

* The import and export figures include oilseeds oil equivalent but exclude palm and palm Kernel oil imports because these are used in the processing of fats which are included in the domestic production figures.

SOURCES: 1. Central Bureau of Statistics 2. E.A.C. Annual Trade Reports (1972-76)

APPENDIX 16: ESTIMATED EDIBLE OILS AND FATS PROCESSING FIRMS STOCKING FREQUENCY SHARES IN NAIROBI AND MOMBASA

Processing Firms or Packers	Wholesale Survey		Retail Survey	
	stocking frequency shares when oils and fats are combined (%)	stocking frequency shares when oils and fats are separate (%)	stocking frequency shares when oils and fats are combined (%)	stocking frequency shares when oils and fats are separate (%)
		FATS		FATS
East African Industries Ltd.	73.6	84.4	65.1	89.1
Acif Oil Refinery Ltd.	9.4	10.8	2.6	3.6
Kapa Packers[1]	4.2	4.8	2.7	3.7
K.C.C. superfine Ghee[2]	-	-	1.6	2.2
Pure Lard[2]	-	-	1.1	1.5
TOTAL FATS	87.2	100.0	73.1	100.1
		OILS		OILS
Elianto Kenya Ltd.	4.2	33.6	7.5	31.8
Rift Valley Products Ltd.	2.1	16.8	1.6	6.8
Coastal Industries Ltd.	4.2	33.6	1.6	6.8
Nakuru Oil Mills	1.0	8.0	0.5	2.1

...../2.

APPENDIX 16: CONTINUED

Oil Mills	1.0	OILS 8.0	0	OILS 0
J.P. Salad Oil[1]	-	-	4.3	18.2
Brighton brand Sunflower salad Oil[1]	-	-	2.7	11.4
P.D.M. Super Edible Oil[1]	-	-	1.1	4.7
Peptang Sunflower Oil[1]	-	-	0.5	2.1
N.S.P. Salad Oil[1]	-	-	1.1	4.7
Mazola Corn Oil[3]	-	-	2.7	11.4
TOTAL OILS	12.5	100.0	23.6	100.0

1. Private Packers
2. Animal Fats
3. Imported edible oil

SOURCE: Author's Survey.

UNIVERSITY OF NAIROBI

DEPARTMENT OF AGRICULTURAL ECONOMICS

APPENDIX 17: EDIBLE VEGETABLE OILS AND FATS PROCESSING FIRMS' QUESTIONNAIRE

Interview number ..... Date.....

Name of firm .....

Address of firm .....

1. When was the firm started? .....

2. Are the factory buildings and offices all in one centre or are there branches?

.....

3. On what basis was the present plant location selected?

(a) proximity to port .....

(b) proximity to Kenyan raw material production areas

.....

(c) proximity to market for final products

.....

(d) other .....

4. Supposing the site of your factory was seriously needed for some other use and the company would be generously compensated for all its production facilities:

(a) Would you re-invest in production of edible vegetable oils and/or fats?

(b) If yes, where would you locate the new plant?

.....

5. Which raw materials does the firm use for the extraction or processing of oils and/or fats (approximate % by weight)? .....
.....

6. The firm buys raw materials from:
   (a) maize and Produce
       Board ..... raw material(s).....
   (b) Cotton Lint and
       Seed marketing Board..... raw material(s)...
   (c) Farmers..... raw material(s).....
   (d) Co-operatives..... raw material(s).....
   (e) Private traders..... raw material(s).....
   (f) Other..... raw material(s).....

7. What proportion of each raw material used by the firm comes from Kenyan sources?
.....
.....

8. How many different suppliers, on average, do you have per year for each type of raw material?
.....
.....

9. Do you face any competition in procuring Kenyan raw materials ..... yes/No. If yes, what farm does it take and how do you deal with it?
.....
.....

10. Do you import any vegetable oils and fats raw materials? .....Yes/No. If yes, which ones? .....

.....

11. If you import vegetable oils and fats raw materials, do you do it directly or do you buy from importing agents? .....

.....

12. From where do the non-Kenyan raw materials used by the firm usually originate? .....

.....

13. Would you like to have more Kenyan vegetable oils and fats raw materials? .....Yes/No..... Why? .....

.....

14. Are there constraints preventing you from purchasing more Kenyan edible oils and fats raw materials? ....Yes/No..... If yes, which ones? .....

.....

15. What action is needed to overcome the above constraints (if any) and by whom? .....

.....

.....

16. Are you aware of other uses of vegetable oils and fats raw materials which compete with vegetable oils and fats processing firms for the former's supply?

.....

.....

17. Does the firm engage in farm production of vegetable oils and fats raw materials? .....

18. At what rates (%), on average, is the plant's capacity utilized? .....
.....

19. What is the maximum annual physical capacity (for a given raw material) of your plant? .....
What % of this has been attained in
1974 .....
1975 .....
1976 .....

20. What proportions of various raw materials used by the firm are lost through spoilage and evaporation?
.....

21. What oil extraction rates(as a % of raw material by weight) are experienced by the firm?
.....

22. (a) Which oil extraction technique is used by the firm? .....
(b) The above technique is used because of:
(a) its lower production costs per unit of output?
.....
(b) its effectiveness in oil extraction? .....
(c) its versatility in use of different types of raw materials? .....
(d) other reasons .....
.....

23. Are there plans to change the extraction or processing technique? .....Yes/No..... If yes, to which technique and Why?

.....

.....

24. Are there plans to increase the plant's physical capacity? .....

25. After oil extraction do you process it further, such as refining, etc.? .....

.....

26. What is the per centage loss during the refining operations and what factors determine the extent of losses .....

.....

27. Do you sell any of your extracted vegetable oil to other firms for packaging, refining or processing it into fats or other products? .....

.....

28. Is the labour employed permanent, casual or both?

.....

29. What was the total number of persons employed by the firm last year (1976)? .....

.....

30. (a) How many shifts do you operate per week?

.....

(b) What is the duration of each shift?

.....

31. What is the average processing cost per ton of output of each of the various oils and fats?
.....

32. What was the expenditure (shillings) on advertisements and sales promotion activities per unit of product last year? .....
.....

33. What proportions of various raw materials used by the firm are converted into oil-cake by-products?
.....
.....

34. (a) Is the firm involved in production of items other than vegetable oils and/or fats?
.....Yes/No.....

(b) If yes, which ones? .....
.....

35. (a) Is there market segmentation with regard to vegetable oils and/or fats produced by the firm? ....Yes/No.....

(b) If yes, on what basis is the segmentation done?
.....
.....

36. How many brands (or types) of oils and/or fats does the firm produce?.....
Names .....
.....

37. On what bases are the firm's vegetable oils and/or fats differentiated? .....
.....

38. Which are the ingredients which constitute the final products and in which proportions are they combined? .....
.....

39. What has been the trend of sales volume of your various vegetable oils and/or fats products?
.....
.....

40. What has been the trend of your output of various vegetable oils and/or fats products? .....
.....
.....

41. Has the firm been producing more of any oils or fats above what is required to meet domestic demand?
.....

42. What proportion of the firms annual output of vegetable oils and/or fats is exported?
.....
.....

43. What is the exfactory domestic price per unit of the final product at present? .....
.....

44. (a) Who determines the exfactory, wholesale and retail prices of the vegetable oils and fats final products? .....

.....

(b) On what criteria are price levels determined?

.....

.....

(c) What changes, if any, would you like to see in the price determination system?

.....

.....

45. (a) Do you distribute your products directly to retailers of do you make use of independent middlemen such as distribution agents or wholesalers? .....

.....

(b) What changes, if any, would you like to see in the distribution system? .....

.....

46. Do you choose your distribution agents and/or wholesalers or do you accept any of them who comes to purchase your products? .....

.....

47. Do you have any depots in various parts of the country or how do you ensure availability of your products to all potential consumers?

.....

.....

48. Is the business:

(a) a multi-national corporation? .....

(b) a Kenyan public company?.....

(c) a Kenyan private company?.....

(d) a partinership?.....

(e) a one-man private business?.....

49. What are the problems, if any, facing your company regarding oils and/or fats business?

.....

.....

.....

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APPENDIX 18: EDIBLE OILS AND FATS WHOLESALER - OR DISTRIBUTION AGENT-QUESTIONNAIRE

Interview number ..... Date.....

Name of wholesaler of distributor .....

Name of town .....

Name of street .....

1. When did you commence business operations in general?

   ....

2. Have you handled oils and/or fats throughout this period? ....Yes/No... If not, for how long? .....

   .....

3. (a) What other food items do you handle? .....

   (b) What are the main non-food items handled, if any?

   .....

4. Which brands of edible oils and/or fats do you handle and who are the processors of each? .....

Brand	Manufacturer
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....

5. Do you handle oils and/or fats exclusively for particular processor(s) or do you buy from a range of different suppliers? .....

6. If you have more than one supplier, how many are they? ....

7. Do the processors of edible oils and fats request you to handle their products or do you approach them initially? .....
....

8. What factors do you consider in deciding to handle edible oils and fats from any suppliers?
   (a) profitability .....
   (b) rate of flow of the product (turnover).....
   (c) reliability of supply .....
   (d) ease of storage .....
   (e) other .....

9. What proportion of your total wholesale business (by value) does the trade in oils and/or fats constitute? .....

10. (a) What is your edible oils and/or fats average weekly turnover (by value)? .....
    (b) Does this vary seasonally? ...Yes/No.....
    By how much? .....

11. Are there certain times of the year when you experience shortage of supply of oils and fats from processors? .....Yes/No..... If yes, When?.....

12. How do you distribute edible oils and fats to the various retail outlet customers?

    (a) Deliver to semi-wholesalers who then distribute to retailers? .....

    (b) Deliver to retailers .....

    (c) Supply retailers who collect from your warehouse .....

    (d) Other methods .....

13. If you deliver the products to retailer or semi-wholesaler, do you charge for delivery? .....
.....

14. How many customers, on average, do you have per week buying oils and/or fats? .....

15. (a) Do you do retail of edible oils and/or fats? ....Yes/No.....

    (b) If yes, what proportion of total edible oils and fats turnover does it constitute?.....

16. Are some of brands of oils and fats that you handle sold to high in income retail outlets and others to low income outlets? ....Yes/No.....

    If yes, what is the basis of differentiation?

    (a) quality of the product .....

    (b) price per unit of the product .....

    (c) packaging and container type .....

    (d) size of the container .....

    (e) other.....

17. What services, if any, do you provide to retailers?

(a) credit ..... (b) delivery.....

(c) advice on pricing, display, storage, etc.....

(d) other .....

18. What services, if any, do you receive from the processors of edible oils and fats?

(a) credit .....

(b) delivery .....

(c) advice on pricing, display, storage .....

(d) other ....

19. Do you undertake advertisement or product promotion activities? Yes/No .....

If yes, do you do it on processor's request or on your own initiative .....

20. Which were the exfactory wholesale prices and wholesale prices to retailers in March this year (1977) for various brands of edible oils and fats?

Brand	Unit	Price
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....

21. How do you find edible oils and fats wholesale business compared to other food items in general?

(a) relatively more/less profitable .....

(b) stocks take too long to clear .....

(c) stocks clear within a relatively short time .....

(d) has high/low spoilage rate.....

(e) other.....

22. In what way(s) do you think the marketing of edible oils and fats can be improved? .....

.....

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APPENDIX 19: EDIBLE OILS AND FATS RETAILER-QUESTIONNAIRE

Interview number ..... Date .....

Name of town..... Street.....

Location of the business.....

Name of the business.....

1. For how long have you been doing retail business?

   .....

2. (a) Do you sell edible oils? .....

   (b) Do you sell edible fats? .....

3. If yes to question 2, which brands of edible oils and fats do you normally sell?

   Kimbo ..... Cowboy..... Blue Band .....

   Eagle..... Kimboga..... Ndege .....

   Veebol ..... Nom..... Cofat.....

   Mom .....

Coastal Double-refined Edible Oils .....

Coastal Semi-refined Edible Oils.....

Elianto Pure Corn Oil .....

Elianto Sunflower Oil .....

Acif Semi-refined Edible Oil .....

Acif Deep Frying Sunflower Oil .....

Mom ..... Suna Oil .....

Others .....

4. What were the proportions by volume of each of the best selling two fats and two oils last year?

   Fat (i) % .....

   Fat (ii) % .....

   Oil (i) % .....

   Oil (ii) % .....

5. Do the majority of your customers buy the packaged fats and oils or do they buy fats or oils measured from debes? .....

6. Of the following package sizes, which do you sell in largest quantity (%) and what is the price of each?

   a) 100 gm Kimbo % ..... Price .....

   b) 250 gm Kimbo % ..... price .....

   c) 500 gm Kimbo % ..... price .....

   d) 1 kg Kimbo % ..... price .....

   e) 2 kg Kimbo % ..... price .....

   f) 3 litre edible oils .....price .....

   g) 4 kg edible oils .....price.....

   h) 500 mls edible oils .....price.....

   i) 700 mls edible oils .....price.....

7. Which are the current retail prices of the following quantities of the weighed fats?

	100 gm.	250 gm.	500 gm.	1 kg.
Ndege		.....	.....	.....
Kimboga		.....	.....	.....
Eagle		.....	.....	.....

8. (a) WHat has been your average monthly turnover (by value) of edible oils and fats sales for the last two months? .....
.....

(b) Has this been increasing or decreasing compared with the previous months and by how much?
.....

9. In comparison with other food items, is business in edible oils and fats:

(a) more or less profitable? .....

(b) of high or low rate of flow (turnover)? .....

(c) risky due to deterioration of products? .....

10. During the last month what has been your losses of edible oils and fats due to deterioration, if any?

(a) fats losses % .... main reason for these losses .....

(b) edible oils losses % ..... main reason for these losses .....

11. Do you experience shortages of edible oils and fats at any time of the year? ....Yes/No.....

If Yes, at what time of the year does it normally occur and why? .....

12. How many wholesale suppliers do you have and are they regular and permanent in the sense that you buy from them all the time? .....
.....

13. Do you buy some edible oils and fats direct from processors? Yes/No..... If yes, what proportion of the total supply does it constitute? .....
.....

14. (a) Are your satisfied with the present edible oils and fats supply system or do you experience some problems? .....
.....

(b) If there are problems, which are they?
.....

15. (a) From your experience, do you think consumers are satisfied with the quality of all or some of the available edible oils and fats?
.....

(b) If not, why? .....
.....