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JAMAICA

Technical report: The Jamaican food processing sector — Where are we today?
An analysis of strategies for growth in the coming decade*

Prepared for the Government of Jamaica
by the United Nations Industrial Development Organization,
acting as executing agency for the United Nations Development Programme

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The Jamaican Food Processing Sector: Where Are We Today?
An Analysis of Strategies for Growth in the Coming Decade

I. Introduction

The Food Processing Sector has long played a very important role in the Jamaican economy. It is a major component of the manufacturing sector, accounting for over 50% of traditional manufactured exports and over 25% of non-traditional manufactured exports. The sector has long held the potential for significant growth. Focus on the sector has recently intensified however, partly as a result of the fact that the earning potential in other areas of the economy have declined or have otherwise failed to achieve the anticipated levels of growth.

This paper explores *where we are today* in the food processing sector. This is done with a view to understanding what opportunities exist, what obstacles there are to achieving the potential of the sector and to identify the steps which need to be taken if this potential is to be achieved.

The following section of the paper examines the current composition of the sector, identifying who the processors are and what they produce. There are currently over sixty food processors in Jamaica, producing a wide range of products. The most commonly produced products include sauces made from local herbs and spices, canned ackee, canned calaloo and tinned juices. In this section we also explore what it is that the processors have been exporting and in what quantity. In addition, an attempt is made to understand the cost structure of the processors and to assess the impact that liberalization and the changes in the rate of foreign exchange have had on the firms in the sector.

In section 3, we examine some of the opportunities currently available to the sector. These opportunities can be broadly classified into two groups. One set of opportunities focus on the processing excess quantities of some of the crops that are currently being produced for export in large volumes - papayas, bananas and mangoes, for example to produce higher value added products. The second set of opportunities are associated with expanding the range and volume of exports in the "specialty" and "ethnic" markets in developed countries. In this section, we examine some of the major trends that have been occurring among consumers, distributors and retailers in the North American and European markets. The objective is to understand what needs to be done if the sector is to take advantage of the opportunities with which it is currently faced.

Section 4 of the paper focuses on the obstacles that exist to the growth of the sector. Particular attention is placed on the availability of raw materials, the linkages between the growers and the producers, the state of the packaging industry, and the level of creativity and management competence in the sector.

In section 5, the paper concludes by providing some suggestions on *where we go from here*.

II. The Food Processing Sector

The Food Processing Sector in Jamaica is made up of over sixty firms that produce a variety of products including tinned fruits and vegetables, fruit juices and concentrates, sauces and processed meats. A listing of the firms in the industry is presented in Exhibit 1 below. The exhibit indicates the location of the processing facilities, the products produced by the firms and a (subjective) assessment of the relative size of the facilities.

Exhibit I
Food Processing Firms in Jamaica and their Range of Products

<u>Firm Name</u>	<u>Location</u>	<u>Size</u>	<u>calaloo</u>	<u>ackee</u>	<u>jama</u>	<u>fruits & vgsa.</u>	<u>juices</u>	<u>coffee & cocoa</u>	<u>spices sauces</u>	<u>soups</u>	<u>dried snacks</u>	<u>processed meats</u>	<u>other</u>
Agro Mart	Kingston	S							✓				
B-Marts Corporation	Kingston	S		✓									Mackerel
Bi-Best Foods Ltd.	Kingston	S	✓	✓									coconut creme
Busha Browne Co.	Kingston	S			✓				✓				
Canco Ltd.	Kingston	S		✓	✓								
Caribbean Exotica	M/ville	S	✓	✓		✓				✓			
Central Food Packers Ltd.	San. Tan.	S	✓	✓		✓							
Citrus Development Co.	Kingston	M					✓						
Coffee Ind. Ltd.	Kingston	L						✓					
Cottage Industries Ltd.	St. Ann	L	✓	✓					✓				
Desnoes & Goddes	Kingston	L											Soft Drinks
Dr. Ian Sangsters & Co.	Kingston	L											Liqueurs
Exotic Products	Kingston	S				✓							
Fachoy Food Ltd.	Falmouth	S							✓				
Fruits of Jamaica	Kingston	M				✓	✓						
Gift Affair	Kingston	S			✓				✓				
Grace Food Processors	Savilamar	L										✓	
Grace Canning Ltd.	Kingston	L	✓	✓		✓	✓		✓	✓			
Grays Pepper Products	Savilamar	S							✓				
Hak Has Manufacturing	Kingston	S							✓				
Higate Food Products	Bog Walk	L											Confectionery
ICD	Kingston	L			✓	✓	✓						
Island Bees Ltd.	Kingston	S			✓								
Jamaica citrus Growers	Bog Walk	L					✓						
Jamaica Extracts	M/ville	S											Essential Oils
Jamaica Producers Group	Kingston	L	✓	✓					✓				
Jamaica Roots	St. Cath.	S											
Jamaica Standard Products	M/ville	S						✓					
K R B Lea & Co	Kingston	S											Liqueurs
King Pepper	Trewlany	S							✓				
Lakeside Enterprises	Kingston	S									✓		

<u>Firm Name</u>	<u>Location</u>	<u>Size</u>	<u>calaloo</u>	<u>askee</u>	<u>jams</u>	<u>fruits & vega.</u>	<u>juices</u>	<u>coffee & cocoa</u>	<u>spices sauces</u>	<u>soups</u>	<u>dried sacks</u>	<u>processed meats</u>	<u>other</u>
MFV Ltd.	Kingston	S							✓				
Mecra Manufacturing	Kingston	S	✓	✓					✓				
Mussons Jamaica Ltd.	Kingston	L	✓	✓			✓		✓				Breadfruit
National Continental Corp	Kingston	L									✓		Biscuits
Native Food Packers	Kingston	S			✓						✓		
Natural Products	Clarendon	S					✓						
Neal & Massey Ltd.	Kingston	L							✓				
Nestle	Bog Walk	L											Milo, Cond. Milk
Perishables		S						✓					
Picka-Peppa Co.	M/ville	L							✓				
Pioneer Chocolate	M/ville	M						✓					Confectionery
Plantation Pride	May Pen		✓	✓		✓							
Resort Consumables	Kingston						✓						
Robert's Products Ltd.	Kingston		✓	✓	✓				✓				
Scott's Preserves	Kingston	L	✓	✓	✓				✓				
Shamrocks Foods	Kingston												Liqueurs
Shims Wholesale	Kingston												Syrup
Southern Processors	St. Eliz.	L											
T. Geddes Grant Ltd.	Kingston	L				✓	✓		✓				
Tia Donna Ltd.	Kingston								✓				
Tijule Co. Ltd.	Clarendon				✓	✓			✓				
Trinjam Food Processors	St. Cath.								✓				
Trout Hall (1969) Ltd.	St. Cath.	L				✓	✓						
VAP Ltd.	St. Cath.			✓									Syrups
Westico Ltd.	M/ville	S		✓									Breakfast Cereal
Wisynco	Kingston	L	✓	✓	✓		✓		✓				

SOURCE: JAMPRO

As indicated in exhibit 1, there is a high degree of similarity in the range of products produced by the firms in the sector. Close to a third of the firms in the list produce sauces from local peppers, herbs and spices. The canning of ackee and calaloo are the next most common activities, followed closely by the production of canned juices, the canning of fruits and the production of jams and preserves. A summary of the number of firms producing specific lines of products is illustrated below:

Exhibit 2
Number of Firms Producing Specific Lines of Products

<u>calaloo</u>	<u>ackee</u>	<u>jams</u>	<u>fruits & vegg.</u>	<u>juices & concentrates</u>	<u>coffee & cocoa</u>	<u>spices sauces</u>	<u>soups</u>	<u>dried sacks</u>	<u>proc. meats</u>
13	14	10	11	12	4	22	2	3	1

Exports

The export performance of firms in the sector is summarized in the table below:

Exhibit 3
Selected Process Food Exports (1992)

	<u>Quantity</u>	<u>CIF Value (J\$)</u>	<u>Primary Destination(s)</u>
Guava Jams and Jellies	106,657 kg	4,672,487	UK, Canada, USA
Other fruit preserves (w & w/o sugar)	45,995 kg	4,008,559	USA, Caricom
Mango Puree	99,372 kg	2,100,680	USA, UK, Canada
Grapefruit chunks	991,216 kg	29,773,242	UK
Pineapple (chunks and slices?)	34,603 kg	1,457,628	Caricom
Orange juice unconcentrated	29,682 liters	672,302	B'dos
Orange juice concentrate	1,927,796 ltrs	56,570,362	Netherlands, US, UK
Grapefruit juice unconcentrated	22,320 liters	460,193	B'dos
Grapefruit juice concentrate	667,270 ltrs	21,246,982	UK, N'lands, T'dad
Pineapple juice	168,805 liters	3,293,175	T'dad, B'dos
Passion fruit juice	5,013 liters	126,429	USA
Other juice of any other single fruit	389,614 liters	10,611,074	USA, UK, N'lands
Pineapple based juices	153,687 liters	3,449,879	USA, b'dos, T'dad,
Other mixtures of juices	314,920 liters	6,930,430	USA, Canada, UK
Vegetables and Vegetable mixtures	283,984 kg	6,642,212	UK, US, Canada
Ackees	871,333 kg	62,953,260	Canada

Exhibit 3 contd.

	<u>Quantity</u>	<u>CIF Value (J\$)</u>	<u>Primary Destination(s)</u>
Roasted Coffee	7,718 kg	3,936,530	U.S.A., Cayman Is.
Coffee Extract	16,796 kg	6,923,987	Japan, Canada, T'dad
Cocoa Powder (unsweetened)	211,107 kg	22,768,072	T'dad, Caricom
Cocoa Powder (sugar added)	103,870 kg	6,769,014	Caricom
Cocoa Butter	163,101 kg	9,361,177	USA
Pepper Sauce	524,524 kg	35,402,541	USA, Canada, Cayman
Other Sauces	388,349 kg	29,844,242	USA, Canada, T'dad
Peppers, crushed and ground	51,142 kg	2,097,442	USA, Canada, UK
Other ground preparations of Pimento	1,772,926 kg	84,746,289	USA, UK, Canada
Ketchup	934,873 kg	14,656,951	T'dad, B'dos, Caricom
Soups	403,056 kg	23,086,175	USA, T'dad, UK
Preserved fruits, peel and nuts	16,618 kg	1,011,286	Caricom
Confectionery	106,721 kg	4,781,203	Caricom
Chewing gum	71,109 kg	1,301,072	Caricom
Chocolates	303,514 kg	37,919,564	Caricom
Biscuits unsweetened	810,059 kg	24,491,406	Caricom
Biscuits sweetened	575,609 kg	28,427,864	Caricom
Chicken Sausages (canned)	857,628 kg	22,489,460	T'dad, Belize, Caricom
Other Chicken Sausages	23,991 kg	1,077,938	Caricom
Other Sausages (canned)	80,040 kg	5,451,007	Caricom
Other Chicken Sausages	3,856 kg	267,240	Caricom
Other preparations of swine meat	39,276 kg	1,761,559	T'dad, Caricom
Total for all listed categories		582,239,841	

Source: *External Trade 1992, part II, Statistical Institute of Jamaica*

Exhibit 3 indicates that the sector exports a mix of products which can be broadly categorized as follows:

- Products targeted at Specialty and Ethnic Markets. Included in this category are pepper sauces, crushed peppers and other pimento based preparations (export value totalling over \$152 million), ackees (\$63 million), jams, jellies and preserves (\$8.7 million)
- Products targeted at traditional markets. These products are produced by processing the excess of some of the crops that are exported fresh. Included in the group are citrus juices (\$103 million), fruit chunks, slices and purees (\$33 million) and processed coffee and cocoa products (\$50 million).
- "Import Substitution" products. These are products produced from a variety of imported materials and for which the primary export market are countries in the Caricom region. Included in this category are sausages (\$31 million), ketchup (\$14.7 million), soups (\$23 million) and biscuits and confectionery (\$95.6 million).

It appears, from the exhibit, that export earnings are evenly distributed among the three categories of products.

Characteristics of the Processing Facilities

Site visits to several of the processors listed in exhibit 1 indicates the following:

1. The Firms are Small by Global Standards. All of the firms, including those listed in exhibit 1 as being large by local standards, are small in global terms.
2. Simple equipment, most of an old vintage. All of the firms use a mix of simple equipment. The equipment used by many of the firms is of an old vintage. Only the largest firms, particularly those involved in the production of citrus concentrate have regularly invested in modern technology.
3. Low Overall Utilization Rates. All of the firms, with very few exceptions buy their local raw materials from farmers and higglers, although a few processors have entered into long term contracts with select farmers. Because of the seasonal pattern of supply, the utilization rate of the factories is low, characterized by period of fairly intense activity interspersed with periods of inactivity. Some of the larger processors import raw materials for canning and repackaging for local and regional consumption. These factories are utilized more intensively, but in almost every case, the factories are utilized on a single shift only.

The Impact of Liberalization

Three of the factors which have had the greatest impact on firms in the sector over the past several years is the rate of inflation and the liberalization of trade, and the rate of interest. Exhibit 4 below shows (a) the change in exchange rates over the period, (b) the movement of the Consumer price index and the component for food and beverages in particular, and (c) the commercial loan rates over the period.

Exhibit 4
Changes in Consumer Price Index, Foreign Exchange Rates and Commercial Loan Rates

	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1990</u>	<u>1991</u>	<u>1992</u>	<u>1993</u>
US\$ Rate^a	5.50	5.52	5.50	6.50	8.17	20.91	22.2	
Annual change in								
Consumer Price Index^b								
all groups (weight: 100)	14.8	6.7	8.3	14.3	22	51	77.3	
food & drink (weight: 55.6)	17.8	7.3	9.5	20.	22.3	54.8	77.5	
Commercial loan rates^c	26.8	26.1	25.8	29.8	34.6	38.7	48.4	

a. US\$ exchange rate on last trading day of the period. Source: *Statistical Digest, Research and Programming Division, Bank of Jamaica, Mar-Apr 1993.*

b, c. Source: *Economic and Social Survey, Jamaica, PIOJ 1991, 1992*

An assessment of the impact of the changes in the most recent periods can be obtained by examining the changes in the dollar value of sales, production volumes and cost over the period. This is illustrated for two of the large processors in exhibit 5. For purposes of comparison, the values in 1991 are indexed at 100.

Several points should be highlighted regarding the information in exhibit 5. Among them:

- The Dollar Value of sales has increased at a rate disproportionate to the change in production volumes. In the case of factory number 1, the dollar value of sales increased by over 158% while production volumes of the individual production lines increased by less than 15% and in some cases declined. In the case of factory number 2, the dollar value of sales increased by 92.1% while production volumes in two lines declined and increased in two others by 25% or less.
- Labour represents a comparatively small percentage of total costs. The cost of labor as a percentage of total production cost is small and has declined over the period. In the case of factory 1 current labour costs represent 4.5% of total cost of inputs, while in factory 2, labour costs account for 6.2% of costs.
- Material Costs (including packaging) account for a large percentage of total costs. In both plants, material and packaging costs are the largest component of overall cost. In the case of factory 1, materials account for over 70% of the costs, and in factory 2 the account for over 60%. It should be noted that there has been a significant decline in the material cost as a percentage of total cost in the case of factory number 2 which uses a larger component of local materials, while the decline has been much more modest in the case of factory 1, where much of the packaging and a significant portion of the raw materials is imported.

Exhibit 5
Comparison of Sales, Production Volumes and Production Costs for Two large Processors 1991-93

Factory Number 1

	<u>1991</u>	<u>1992</u>	<u>1993</u>
Index of Dollar Value of Sales	100	210.3	258.1
Production volumes of individual product lines:			
sauces	100	106	114
processed fruits and vegetables	100	83.9	95
Canned juices and concentrates	100	121	111
other	100	99.2	110
Cost of Inputs as a % of Sales:			
raw materials (including packaging)	73.7	74.2	71.4
labour	5.3	3.3	4.5
Fuel & Power	1.7	1.9	1.6
Overheads	12.7	15.4	22.4

Source: Company reports

Factory Number 2

	<u>1991</u>	<u>1992</u>	<u>1993</u>
Index of Dollar Value of Sales	100	136.6	192.1
Production volumes of individual product lines:			
Production line #1	100	115	125.1
Production line #2	100	108.3	115
Production Line #3	100	87.8	97.8
Production Line #4	100	53.2	74.5
Cost of Inputs as a % of Sales:			
raw materials (including packaging)	70.8	65.2	61.9
labour	7.5	5.5	6.2
Fuel & Power	2.9	3.4	3.3
Overheads	18.5	21.3	27.8

Source: Company reports

- Overheads represent a large and increasing component of total costs. It is important to note that most of these overhead costs are primarily period costs and fixed. The larger the production volume in the period, the lower is the allocation of overhead cost on a per unit basis. As noted above however, some production lines in most of the factories are utilized only sparsely, amounting to less than one shift utilization throughout the year, and only the most productive plants operate the majority of their lines on a single shift basis continuously. There are no plants operating on a two shift or three shift basis throughout the year. This suggests that the factories can become more competitive by increasing the rate of utilization.

III. The Opportunities and Challenges of the Export Markets

There are a number of opportunities for increasing the foreign exchange earning potential of the sector. These opportunities exist in at least two areas. These are the export of specialty or ethnic products and products targeted at the mainstream of the major markets. In this section we explore opportunities in each of these areas beginning with the ethnic and specialty products market.

IIIa. The "Ethnic" and "Specialty Foods" Market

There are several factors which give rise to the perception that there is good potential for expanding the volumes of export into the American, Canadian and European markets for ethnic and specialty products. Among them are the following:

1. There are a large number of migrant Jamaicans and their offsprings in the USA, UK and Canada. There is a widely held perception that products which can be successfully marketed in Jamaica can also be marketed to this "diaspora".
2. A variety of Jamaican restaurants and businesses including bakeries and retail outlets have begun to develop in some of the major cities in the USA, Canada and Europe. It is therefore assumed that there would be a strong demand for Jamaican processed foods and snacks for use and for retail through these outlets.
3. The name "Jamaica" sells. This is something that producers from across the globe have discovered and the name is used to sell a variety of products including a variety not produced locally.
4. It is felt that there is a strong opportunity for "crossover" of many of these ethnic products into the specialty food market. This is based on the fact that:
 - the gourmet consumers and trade are accustomed to imported products
 - the trade is used to dealing in smaller volumes than the mainstream market
 - specialty foods is the fastest growing segment of the food trade.

The critical problem associated with this market is the distribution. The distribution system for ethnic and specialty foods is a complex labyrinth of distributors that service the varying needs of the two major retail channels - the supermarkets and specialty food stores, as well as a wide range of gift

shops and warehouse clubs etc. The system of distribution is much less well structured than in the main food markets, and the task of managing the channels is therefore more complex.

Because the volumes of sales for most of the products which fall into this category cannot support the cost of the wide scale advertising campaigns needed to reach the dispersed customer base, these products need a more elaborate merchandising system, involving sampling, special recipes, and sales people who are more knowledgeable about the products than is normally the case in supermarkets. There is a need to create a cosmopolitan and exotic image through packaging, with containers which are easy to hold and to dispose of.

There are a wide range of products produced locally which appear to have the potential for cross over into the specialty market. Among them are condiments, herbs and spices, Jams and Jellies, Desserts and Confectionery, and beverages including specialty teas and coffees.

In order to maximize the opportunities in the ethnic markets and for crossing over into the specialty products markets, considerable attention must be given by the processors to the following factors:

- Developing attractive colours and flavors. An emphasis must be place on the tastes of the target market.
- Quality of presentation. Containers must be of the right size, right materials and create an exotic image.
- Products should emphasize convenience and ease of use.
- Formulations should minimize the amount of sugar and sodium and should have a low cholesterol level.
- Rapid product development. Products in the specialty food segment typically exhibit short life cycles. Successful products are quickly imitated. It is important that the processors anticipate this short life cycle by experimenting on an ongoing basis with new product offerings and developing the ability to bring these to market rapidly.

It should be noted that products in this category are of particular appeal to the small and medium sized firms in the sector (although not exclusively so). Because of the high cost of distribution in these markets it would be to the advantage of all if methods of sharing transportation and distribution costs can be devised.

IIIb. Opportunities in the Mainstream Markets

In addition to the opportunities which exist in the ethnic and specialty foods markets, there are opportunities in the mainstream markets which lend themselves to the capabilities of some of the larger processors. There are several fundamental trends which underlie the opportunities for growth in these markets. Among them are the following:

- i) The increasing affluence of consumers in these markets. The per capita expenditure on food has increased.

- ii) Consumers in these countries have become even more concerned with the convenience with which foods can be prepared and/or consumed. The demand for pre-processed and partially processed foods is therefore on the increase.
- iii) Consumers in the developed countries have begun to exhibit a growing health consciousness. This has given rise to a greater level of consumption of fruits and vegetables, juices etc.
- iv) There is a greater acceptance of international trends in food and entertainment. Consumers have become more inclined to "experiment" with new preparations of food, including some which have traditionally been classified as ethnic foods. There is, in particular, a perceptible increase in the demand for tropical flavors.
- (v) the wage rates in the developed countries has increased quite substantially. This has resulted in a declining competitiveness of food processing firms located in those countries, particularly those which involve the high inputs of labor.

The challenges which face local processors that attempt to exploit these opportunities derive from the following:

- i) there is a marked concentration in the structure of the marketing and distribution channels in the developed countries. This has resulted in fewer larger brokers and retail chains. The power of these firms to bargain down the prices of local firms seeking to export to those markets has therefore increased. These large brokers and retail chains are also in a position to demand higher levels of quality and lower lead times. They are less tolerant of failures, and will switch quickly from one supplier to another if problems occur in any area of the supply chain.
- ii) the increasing competitiveness of other Latin American and Caribbean Countries. These countries, located as they are in the same geographic region as Jamaica, enjoy the same transportation economies as Jamaica. Labor rates are low and are comparable with those in Jamaica. Many, if not all of the tariff and tax concession that are extended to Jamaica by the United States are also available to the firms in those countries. There is apparently a higher level of integration of firms in the agro processing sector of those countries and they have developed a reputation for quality and reliability in responding to orders.

Market Structure for "Mainstream" Products in the Major Destinations

In this section we briefly review the important features of the structure of the markets for imported food products in the USA and Europe. Comprehensive review of the market structure in these countries are presented in *"Fruit and Vegetable Processing Options for the Latin America and Caribbean Region: Volume I"*, ATMA International Inc, 1991, and Hughes, D. *"Breaking with Tradition: Building Partnerships and Alliances in the European Food Processing Industry"* Wye College and the Institute of Grocery Distribution.

United States of America

There are three basic marketing channels for processed foods in the United States - (i) the retail trade, (ii) institutional buyers (food service) and (iii) industrial users.

THE RETAIL TRADE

The retail trade in the United States can be further divided into three channels:

- (i) **Brand Programmes.** This is the traditional approach in which the manufacturers differentiate their products by packing and distributing them under a proprietary label. The distribution of the product typically requires considerable promotional activity and, in today's market, a high level of sophistication. In most cases, the manufacturer sells his product to brokers, many of whom have a regional focus, servicing the retail community within a given geographic area.
- (ii) **Co-pack Contracts.** Under this system, products are packed on a contract basis for firms with an established brand. Most firms with established brands have very high standards. It is important that the manufacturing firm is able to produce to these standards on an ongoing basis before entering into contracts with these firms. Typically the firm with the established brand will institute a programme of frequent site visits to check on quality and to ensure the maintenance of standards. In some instances, they might even post a representative at the firm during the periods in which their product run is to be produced.
- (iii) **Private Label.** This is the approach exhibiting the most rapid rate of growth. There are at least three different types of private label firms:

Store Label. Most large and medium sized grocery chains have their own label. The products sold under this label are custom packed by independent canners and freezers. Although some chains buy directly from the manufacturers, the more common practice is for them to deal with intermediaries referred to as "city brokers" who command a brokerage fee of about 3% on sales. Rather than purchasing specific quantities of goods, the chains develop approved supplier lists containing at least three processors for each product line. When the need arises, they negotiate directly with the processors or through the broker and then place the order when a deal has been struck. Normally, the chains require rapid response to their request for the supply of a product, with lead times of 1-2 weeks being the norm. These chains pay careful attention to the quality of the products sold under their label, and sometimes requires that the process be inspected by their agents on a regular basis.

National Buying Group. In order to compete with the large chains, many small and medium sized chains have become members of national buying groups. In some instances, a medium sized chain may carry two private label brands in its stores - a store brand and a buying group brand. To do business with a national buying group, the food processor must first get his products approved by the buying group. The buying groups often approve a relatively large number of processors. Once approved, processors must sell to individual member chains through the processors own distribution channel. The buying group normally requires a 3% commission on sales, and the broker who handles the transaction on behalf of the processor will require

another 3%. Usually, no firm amounts are contracted for and no guarantees for annual sales are given. The amount actually sold by an individual processor is a function of the sales volume in the particular store and the competitiveness of the processor. An important function of the buying group is to maintain the standards. Often they will insist that an agent inspect the plant.

Field Brokers. This is currently the least common approach to marketing products. Under this scheme, a broker develops its own label. They buy on the open market as required, charging a commission on sales.

FOOD SERVICE INSTITUTIONS

This market consists of three basic types of institutions who purchase processed foods:

- (i) wholesale distributors
- (ii) restaurant chains and contract feeders
- (iii) bid business for government institutions

Wholesale distributors: each geographic region of the country is serviced by a number of wholesale distributors who provide for the food service trade. All but the biggest of these belong to national food buying groups. In some cases, the buying group owns and manages individual wholesalers. In other cases the wholesalers are integrated cooperatively. Under this system of marketing, products must be approved by the buying group before any sale can take place. Members of the group are normally charged a commission of about 2-3% on completion of the transaction.

Restaurant Chains: most restaurant chains use local wholesalers although a few buy direct. Contract feeders contract to provide food on a continuous basis to institutions such as airlines, schools and hospitals. They typically buy direct from the processors or through local wholesalers.

Bid Business: Government agencies in the United States are required to put out to tender all orders above a certain size. The food processors typically bid directly for these contracts, although in some states, there are "bid houses" who specialize in this business for the geographic area. Before bidding on a contract, they will call several processors and get commitments for specific volumes at specific prices. A firm order will not however be placed until it is determined whether or not the firm has won the contract.

INDUSTRIAL SALES.

There are three primary industrial uses of processed foods:

- (i) as ingredients
- (ii) for repacking or reconstitution into customer sized packages
- (iii) as components in assembled products such as frozen foods, dried fruit mixes etc.

Sales are made directly and through brokers.

Europe

The trends in Europe are as follows:

- 1) an aging population
- 2) smaller household sizes
- 3) increasing consumer spending power
- 4) increasing demand for consumer foods
- 5) increasing health consciousness, with customers demanding sugar free products with no additives or preservatives.
- 6) The creation of a common market.

Factors 1-3 have jointly led to a rapid increase in the number of new products and to the extension of existing lines of products through the introduction of new variants targeted at older, more affluent customers. Factor four results from the increase in the number of families in which both husband and wife works. Convenience foods are a mechanism by which the working housewife is able to buy more time for herself.

The sixth factor has resulted in a wave of mergers and acquisitions. The key is to achieve even greater economies of scale and to use this as a basis for gaining competitive advantage. In acquiring another chain in another country, these mergers provide the acquiring firm with an existing, pre-established network.

The distribution channels in Europe are the same as in the U.S.: Retail, Food Service and Industrial. The pattern of change has also been similar with a rapid expansion of very large chains at the expense of small stores. There is also a pattern of cooperation among groups of independent retailers and brokers who buy goods from common processors etc., and who operate under binding relationships.

Specific Areas of Opportunity

In this section we briefly review the market potential for several processed food items that seem to hold some potential for Jamaican processors.

Fresh Precut Vegetables and Tropical Fruits

One area which hold significant potential for growth is the production of precut fresh fruits and vegetables. Of particular interest to Jamaican processors are pre-cut tropical fruits and fruit salads. Because of the perishable nature of fresh precuts, the only feasible target market is the United States.

Although fresh precut fruits and vegetables have been available to American consumers for many years, their popularity has recently increased quite substantially. Several factors have fuelled this growth:

- **The food service industry, which includes restaurateurs, institutional feeders etc., is constantly searching for simpler, cheaper ways of preparing menu items. Fresh precut fruits and vegetables is currently the fastest growing segment of this industry. Precuts are attractive as they:**
 - reduce storage space requirements
 - allow for less waste and for greater overall produce yield
 - provide pre-portioned packaging and thereby reducing the guesswork involved in food preparation.
 - allow for reduced production costs. Given the comparatively high labor costs in the USA, precuts are attractive because they eliminate the need for trimming and peeling operations which are time consuming and expensive when performed at the food preparation site.
 - allow for a reduction in risk in the food preparation area and help contain the spiraling employer liability insurance costs. This is because precuts eliminate the need for employees to handle sharp knives in the peeling and trimming operations.

- **demand in the retail sector has also increased substantially. This increase in demand is associated with the following factors:**
 - customers are becoming more convenience minded. Precuts result in considerable savings in preparation time
 - precut fruits and vegetables can be packaged in single serve microwaveable containers with sauce packs etc. This is attractive to the convenience minded consumer.

- **Facilitating the growth in both the food service and retail sectors has been some important developments in packaging and processing technologies. These developments include:**
 - "smart", breathable membrane films which regulate how quickly oxygen and carbon dioxide enter or leave the package. The composition of these membranes can be specifically tailored to the needs of the different types of tropical fruits and vegetables. A key benefit of these developments is that these membranes make it unnecessary to use preservatives
 - clear plastic-type trays with packets of table salt to regulate the environment and absorb moisture
 - controlled atmosphere containers for storage and shipping. This process involves the use of microprocessors to control the environment within the container to maintain conditions which are optimal for the particular fruits and vegetables being stored and shipped.

- "suprechilling" in which the product is cooled quickly to 20-32 degrees before wrapping it in a modified atmosphere package which is a semipermeable bag containing a mixture of oxygen, carbon dioxide and nitrogen. This process makes it possible to extend the shelf life of many pre-cut fresh fruits and fruit salads to 30 days or more, without the use of preservatives.

Together these and other technological developments have extended the shelf life to 18 days for vegetables and 30 days for fruits.

While the demand for pre-cut fruits and vegetables as a category has been increasing, tropical fruits and fruit salads have been the fastest growing segment. The current market size for tropical fruits and fruit salads in the United States is estimated a U.S. \$50 million. It is estimated that this market could total \$150 million per year by the year 2000. The most common fruits have been pineapples, citrus and melons, although mangoes and papayas are also widely utilized. Among the reasons for current high level of demand and the rapid growth of the segment is the fact that:

- restaurants of all types (from white tablecloth to fast food) are finding new uses for these products
- these fruits typically involve considerable hand cutting, and by performing these time consuming operations in the region in which they are grown, the labor costs are reduced.
- the effective yield in terms of usable fruit segments is between 40 and 50% of the total fruit. By peeling and de-pitting in the region in which they are grown shipping costs can be considerably reduced by eliminating the unusable portions.

As a potential processor of pre-cut fruits, Jamaica has the advantage of being close to the United States. Jamaica also enjoys preferential duty treatment under the CBI initiative.

If Jamaica is to become a player in this sector, there are several areas which would require close attention. They include:

- the ability to stay abreast of new developments in packaging and handling methods.
- quality control. The exporting firm must be skilled and expert in:
 - measuring and containing microbiological contamination
 - safety procedures in the use of chlorine and other disinfectants
 - refrigeration
 - waste management
- Process control. Control of the production process is critical. Maintaining integrity and freshness throughout the distribution chain is essential.
- capital cost. A minimum of US\$100,000 in capital expenditure is required to establish a plant of the minimum economic (capable of about one truckload of finished pre-cut and packaged product).

- a minimum of 2.5 acres/day of fruits and/or vegetables to keep the plant productively occupied.

Tropical Fruit Juices, Pulps and Concentrates

this category of products is made up of the following range of products:

Single Strength Juice which is the liquid extracted from the fruit without deletions of water or other substances, and without the addition of sugar or other substances

Fruit Juice concentrates which is single strength juice with portions of water mechanically eliminated. The degree of concentration refers to the amount of water evaporated.

Pulps and Purees refers to fruit after it has been peeled, depitted, macerated and processed through a screen.

The world trade in this category of products grew at a compound rate of 13.5% between 1977 and 1988.

Exhibit 6 World Trade in Tropical Fruit Juices, Pulps and Concentrates

US\$ billions			
<u>1977</u>	<u>1981</u>	<u>1984</u>	<u>1988</u>
1	2	2.8	4

Citrus juices, primarily orange accounts for 59% of the trade, although this percentage of the total is declining.

Developing countries account for just over 50% of this trade (\$2.1 billion in 1988). Brazil is the largest exporter accounting for \$1.5 billion in 1988, with its primary export being orange juice.

The major importers of Fruit and Vegetable Juices are listed in exhibit 7 below:

Exhibit 7 IMPORTS OF FRUIT AND VEGETABLE JUICES BY MAJOR MARKETS 1984-88

	US\$ millions				
	1984	1985	1986	1987	1988
Total	2,801	2,624	2,680	3,300	4,013
United States	1,090	823	869	974	1,119
Germany	312	360	417	530	667
U.K.	226	244	226	324	413
Netherlands	145	166	177	246	317
Canada	231	241	207	239	245
France	125	131	138	182	247

Source: COMTRADE Data Base of the United Nations Statistical Office

Within these countries, the beverage industry is the biggest user. In 1990, the fruit beverage sales in the USA was \$10 billion and this rate of consumption has been growing at a compound growth rate of 7.6% per year over the past 10 years. These sales are expected to continue to grow at about the same rate for the remainder of a decade with sale amounting to in excess of 20 billion dollars by the turn of the century. (Fruit and Vegetable Processing Options for the Latin American and Caribbean Region - ATMA International Inc. (May 31, 1991)).

This increase results from an increase in per capita consumption from 12.7 gallons to 14.2 gallons/capita between 1980 and 1990. The total consumption was 3.5 billion gallons in 1988, and is expected to exceed \$4.4 billion in the year 2000.

It is important to distinguish between two main categories of beverages in which tropical fruit juices and concentrates are used:

1. Fruit juices containing 100% juice
2. Fruit "drinks" which are combinations of fruit juice and other ingredients such as water and corn syrup.

While the growth in both categories is of importance, it is clear that the growth in consumption of the first of these is more critical given the much higher percentage of juice in the composition of the beverage.

A second big user of tropical fruit juices, pulps and concentrates is the Dairy industry. Juices are used in yogurt, ice cream, desserts, puddings, sauces etc. It should be noted that while dairy accounts for 10% of world trade, it accounts for over 30% of trade in tropical juices.

Other industries, jams, marmalades, jelly, baby food, bakery products and confectionery account for 10% of world trade but less than 5% of the trade in tropical juices, pulps and concentrates.

The tropical market is normally divided into two categories:

1. pineapples which accounts for the largest part, amounting to 127,000 metric tons in 1990
2. other tropicals of which the largest are passion fruit juice, mango puree, banana puree, guava and papaya.

The Phillipines dominates the market for Pineapple juice accounting for over 50% of the world trade. The table below provides information on the major producers and exporters of this product. India is the worlds largest producer and exporter of mango puree. The country obtains a premium price due to the perceived quality of its product. The production volumes of mango puree for the major producing nations is shown in exhibit 9, and the volumes of puree imported into the United States and the source is shown in exhibit 10. Exhibit 11 provides information on the production of Guava puree.

Exhibit 8
PRODUCTION AND EXPORT OF SINGLE STRENGTH PINEAPPLE JUICE
SELECTED COUNTRIES

Country	'000 Metric Tons					
	Production			Exports		
	1988	1989	1990	1988	1989	1990
Philippines	44.1	44.7	46.5	28.4	34.2	35
Mexico	4.5	4.5	4.0	2.0		
South Africa	1.4	1.0	.95	1.1	.89	.8
Taiwan	2.7	2.1	1.5	.1		
Malaysia	1.2	1.3	1.3	.5	.5	.7
Kenya	.4	1.0		.2	.4	
Cote d'Ivoire	2.3	2.8	2.9	1.2	1.6	1.6
Australia	27.6	34.8	36.0	2.6	3.6	4.5
Total	84.2	91.7	91.1	34.1	41.2	42.8

Source: USDA/FAS, Horticultural Products Review

Exhibit 9
WORLD MANGO PRODUCTION

Country	'000 tons					
	1983	1984	1985	1986	1987	1988
India	8,874	9,154	9,888	9,416	9,400	9,450
Mexico	685	851	1,109	902	843	955
Pakistan	683	673	692	713	737	713
Indonesia	344	633	385	500	400	400
Brazil	413	421	422	420	422	390
China	353	315	322	330	370	385
Haiti	340	354	363	350	352	355
Philippines	361	367	381	301	346	340
Thailand	388	344	336	373	387	387
Taiwan	29	95	82	75	134	128
Florida	7	9	8	8	10	10

Source: Yourassowski, K. Tropical Fruits, Fresh Processed - A survey of World Trends in Mangoes, Guavas, Papaya and Passion Fruits F.N. Research and Marketing. U.K.

Exhibit 10
MANGO PULP AND PASTE IMPORTED INTO U.S.A. 1985-88

	1985		1986		1987		1988	
	tons	\$'000	tons	\$'000	tons	\$'000	tons	\$'000
Dominica Rep.	221	105	328	239			212	100
India	318	532	470	772	431	660	419	704
Philippines	342	409	344	332	452	455	887	796
Total	1,834	1,468	1,573	1,704	1,398	1,503	1,650	1,742

Source: Youssowski, K. Tropical Fruits, Fresh Processed - A survey of World Trends in Mangoes, Guavas, Papaya and Passion Fruits F.N. Research and Marketing. U.K.

Exhibit 11
ESTIMATED WORLD PRODUCTION OF GUAVA PUREE 1988

<u>Countries</u>	<u>Tons</u>
United States (Hawaii)	6,000
Brazil	4,000
South Africa	1,000
Australia	1,000
India	1,500
Pakistan	200
Taiwan	200
Others	600

Source: Adapted from "Fruit and Vegetable Processing Options for the Latin American and Caribbean Region" ATMA International, 1991

Importers in most major markets are interested almost solely in bulk packed fruit juice in the form of juice concentrate or fruit pulp/puree. *There is a general lack of interest in imports of consumer packed juices whether in can, bottles or cartons.*

Much of the fruit juice and concentrates imported into the USA are bought by Brokers. These brokers act as importers, buying the product at a fixed price and reselling it to their customers. The larger of these brokers buy trailer loads of product, while smaller brokers like to buy in mixed container loads. Buying in smaller quantities in this way helps to reduce their inventory holding cost.

Buying practices vary. Some brokers will buy on a fixed price basis for an entire season, while others purchase on a variable price based on some published price index. Some of the brokers maintain long term relationships with suppliers, providing long term assistance and sometimes financial assistance.

The producers of essences and flavors in the U.S. play an important role in supplying raw materials to the dairy industry. Some of these producers import directly, others work through brokers.

The keys to success in this category of products include:

- maintaining high field yields of raw materials
- maximizing the utilization of plant capacity
- low transportation costs to the markets
- consistent, well planned marketing programme

Jamaica enjoys an important advantage is that there is a 100% duty on "other" tropical originating outside of the CBI countries.

The primary problems facing countries such as Jamaica include:

- ensuring adequate supply of raw materials
- management
- availability of (working) capital
- interest rates

Dried Tropical Fruits

Drying is one of the oldest techniques for food preserving. These products are used in convenience items such as dehydrated fruit snacks, fruit drinks, pie filling and mixes and in natural foods in which there are no additives.

The attractive feature of dried fruits include the fact that:

- a long shelf life (of up to two years) can be achieved without very expensive packaging
- lower shipping cost since no refrigeration is required
- the caloric value and nutritional content of the dried fruit is approximately the same as the fresh fruit
- the consistency of the product is quite high
- it is very convenient and economical to use in the industrial food service trade as an ingredient in various preparations particularly because they can be shaped and formed to fit any requirement
- the packaging requirements are quite minimal allowing for the use of economical, disposable packaging. The primary requirements are exclusion of moisture and oxygen.

In 1990 the market for dried fruits in the United States was as follows:

Industrial Sales	\$600 million
Health Stores	\$60 million
Supermarkets	\$107 million
Dried fruit snacks	\$ 90 million

Although Tropical dried fruits represents only a small part of the total market for dried fruits, the sales of dried tropical fruits through the supermarket and health food channels has been growing at a rate of 25% per year compared to 6% for the overall category. The consumption of dried Tropical Fruit Snacks has been growing at a rate of 18% per annum.

The demand for tropical fruit snacks is highest in the south of the United States. A recent survey of supermarkets throughout the country indicated that 8.9% of the dried displays were dedicated to tropical fruits in the South compared to only 1.3% in the North East. In addition, 3.5% of shelf space was dedicated to products that contained tropical dried fruits. Banana chips and dried banana accounted for over a third of the tropical products displayed. Fruit snacks with tropical flavors have been growing at a rate of over 25% per year.

The largest demand is for dried pineapple slices, although there is also a high demand for papaya and mango. The recorded imports into the United States in 1989 were as follows:

Dried Pineapple Slices	1,918 tons
Dried Papaya Slices	621 tons
Dried Mango Pieces	169 tons

The market for dried tropical fruits is even larger in Europe, where Germany and France are the largest consumers, accounting for over 50% of the total volume. The Netherlands is the largest importer of this category of products, but this is primarily for redistribution throughout Europe. The strongest demand is for dried banana chips and mango and papaya slices. The latter two items are used primarily as components in tropical fruit mixes.

The recorded imports into Europe in 1989 were as follows:

Dried Banana chips	1,594 tons
Dried Papaya slices	754 tons
Dried Mango pieces	750 tons

The goal in producing dried fruits is to reduce the amount of moisture in the fruit to a level below which micro organisms can grow. There are three basic methods of achieving this for tropical fruits:

- sun drying and solar drying. Here, moisture is evaporated away from the fruit to form a stable product. The moisture content is reduced to 14% plus or minus 4%.
- atmospheric dehydration. Mechanical equipment and artificial heating are used to reduce the moisture level. Careful control is exercised over temperature, humidity and air flow. Usually, dehydration takes place until the moisture level is 1-5%. Such a low water content makes it possible to store the product at room temperature for

over 2 years. In a water proof container, the product may last for up to 5 years.

- sub-atmospheric dehydration. this approach is used primarily for low moisture fruits with high sugar content. There are two basic types of sub atmospheric dehydration - freeze drying and vacuum drying. Freeze drying involves freezing the fruit under high vacuum - ice sublimates as water vapor without melting. In the vacuum drying process, the fruit is dried in a vacuum chamber under reduced atmospheric pressure which causes water to be removed from the food at less than the boiling point at ambient conditions.

The selection of the drying methods depends on the form of the raw material, the property of the material (how sensitive it is to oxidation, temperature, etc.), the desired product characteristics (powder, instant solubility, rehydration, retention of shape etc.) and cost.

Sun drying is the oldest of these methods and still accounts for the majority of dried fruit consumed today. While only a small amount is dried mechanically, the amount is growing rapidly due to advances in dehydration technology and the decline in the cost of the processing equipment. The effect is an increase in the range of products available in high quality and an increasing acceptance in retail markets.

Sulphur is a chemical which is widely used in the drying of fruits because of its antioxidant and preservative properties. Its use is essential in the sun drying of tropical fruits to prevent browning. Recently however, there has been some reaction to the use of sulphur because of the allergic reaction that some consumers have to the chemical. As a result some importing nations such as Germany and Japan have introduced regulations concerning its use.

In the United States where dried fruits are gaining popularity in the health food sector, there is a similar reaction to sulphured products. This has given additional incentive to some producers to introduce some of the newer mechanical processes.

The large Remanufacturers of dried fruits are however very cost oriented, and continue to deal primarily in sugared and sulphured products.

Thailand is the world's largest exporter of dried fruits (excluding Banana) followed by the Philippines and Taiwan. The processors in these countries are reported to have invested in state of the art equipment and are able to achieve high levels of process control in the production and distribution systems.

The concentration of supplies in the Far East serves to create opportunities for processors in Jamaica. The following should however be noted:

- the freight costs are not very high (particularly since the water content is so low)
- the duties for dried fruits are low (only about 4%)
- the markets appear to be in "equilibrium". That is, traders are satisfied with the availability and quality of supplies and are satisfied with current suppliers.

The above suggests that entry into this market may not be a particularly easy process. To enter successfully, it would be necessary to:

- maintain a broad base of fruit
- develop special offerings including those with multiple fruits with and without sulphur and sugar
- offer mixed containers of product to facilitate "one stop shopping"
- maintain inventories in target markets so that shipments can be made quickly. Because the market is competitive, being able to supply customers with short lead times is important
- Invest in sulphur free production processes

It should be noted that an efficient sized plant using current technologies would have a capacity of about 300 tons per year. This would represent approximately 3-5% of the estimated current total world trade in tropical dried fruits.

The above analysis suggests that there are opportunities in at least three areas: (i) pre-cut fruits, (ii) juices, purees and concentrates and (iii) dried fruits and snacks.

These opportunities lend themselves to the larger players or to an association of smaller processors who jointly share production and distribution facilities.

These opportunities require the development of new know-how in the area of packaging. It also requires a predictability in the supply of the basic raw materials at globally competitive prices.

Some analysts have argued that these markets are beyond the reach of Jamaica. The success in exporting citrus based products indicates that this is not so. Moreover, a strategy of targeting new opportunities in this area do not preclude pursuing opportunities in the ethnic market. As exhibit 1 illustrates, there are a large number of processors locally, some better equipped for the first strategy, others for the second.

IV. The Challenges facing the Sector

In this section we briefly review some of the critical challenges facing the food processing sector if the opportunities identified in the preceding section are to be exploited. Particular attention is focused on two main areas - (a) the quality, price and availability of raw materials to support an expansion in exports, and (b) the quality and availability of packaging.

IVa. The Supply of Raw Materials

If the food processing sector is to exploit the opportunities identified above, it is important that the processors have available to them an adequate supply of raw materials at an appropriate price. In this sub section we briefly review recent trends in the supply of raw materials and the relationship between farmgate, market and export prices for selected crops.

Exhibit 12 provides information on the production of all the crops classified as "non-traditional" by the Data Collection and Statistics Branch of the Ministry of Agriculture. The information in the table indicates that the production grew by 72% in the eleven year period between 1982 and 1993 (reflecting an annual growth rate of about 5%) although there was almost no increase in the acerages under production. In aggregate, the yield per hectare rose from 7.1 metric tons to 10.3 metric tons.

Exhibit 12
TOTAL RECORDED PRODUCTION AND CULTIVATED ACERAGES IN JAMAICA FOR
ALL NON-TRADITIONAL CROPS 1982-93

	('000 Metric Tons, '000 hectares) ¹											
	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Production	339.4	379.7	365.1	445.2	427.8	485.7	381.6	350.3	411.2	415.4	506.9	584
Acerage	47.4	47.9	53.8	52.3	53.3	59.5	43.4	40.5	45.1	45.9	49.0	

Source: Data Collection and Statistics Branch, Ministry of Agriculture

Exhibits 13 and 14 provide more detailed information on the production and cultivated acerages of specific crops. These figures indicate that the crops which have experienced the greatest expansion in output are papayas, which grew at a rate of 22.2% over year over the period (and at a rate of 56.3% per year over the three year period 1990-1993) and peppers, both hot and sweet.

In terms of cultivated acerages, the rate of growth was more modest. The acerages under cultivation of papaya grew at an average rate of 12% per year and the acerages of peppers grew at an average rate of 6% per year.

¹

1 Metric Ton = 1,000 kg; 1 hectare = 2.471 acres = 1000 square meters

Exhibit 13
PRODUCTION OF SELECTED NON-TRADITIONAL CROPS 1982-93

	('000 Metric Tons)											
	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Yams	117	130.6	149	163.8	165	175.4	166.9	132.4	161.4	186.1	214.4	222
Calaloo	10.4	10.2	11.8	11.1	10.8	9.8	9.2	10.3	11.4	10.7	14.3	16.7
Carrots	14.8	15.7	17.6	14.6	15.6	15.3	11.6	14.2	15.5	15.2	18.9	22.8
Cucumber	5.1	6.5	7.1	11.9	13.2	13.6	8.6	8.2	8.1	6.9	9.1	12.5
Pumpkin	23.1	32.5	39	30.4	27.0	25.7	21.8	23.7	26.2	26.3	34.2	34.7
Hot Peppers	1	2	3	2.2	2.1	2.2	1.9	1.7	2.1	2.6	3.7	5.5
Sweet Peppers	1	1.3	3.1	4.9	5.3	5.6	2.7	2	2.4	2.6	3.7	5.5
Thyme	0.19	0.2	0.2	0.17	0.2	0.23	0.21	0.27	0.35	0.4	0.84	0.78
Escallion	2.4	3.9	4.5	3.5	3.1	4.5	2.7	3.0	4.2	2.6	7	9.6
Papaya	1.6	1.5	2.1	2.1	2.2	2.9	2.9	3.1	3.8	4.8	9.8	14.5
Pineapple	8.2	6.3	8.0	7.4	7.1	7.3	9.4	9.7	9.3	9.8	11.4	21.1
Plaintain	28.4	25.1	29.5	30.4	30.6	38.7	26.2	9.9	27.6	26.7	28.5	35.8
Sorrel	0.4	0.6	0.7	0.8	0.7	0.7	0.4	0.4	0.5	0.6	0.8	0.98
Total	213.6	236.5	275.6	283.3	280.6	303.2	264.5	218.9	272.9	295.3	357.4	403.0

Source: Data Collection and Statistics Branch, Ministry of Agriculture

Exhibit 14
CULTIVATED ACERAGES OF SELECTED NON-TRADITIONAL CROPS 1982-92

	('000 Hectares)										
	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Yams	9.5	10.6	11.8	12.7	12.9	13.8	13.1	10.7	14.4	13.9	14
Calaloo	.88	.89	1.0	.94	.88	.80	.75	.78	.87	.85	.95
Carrots	1.46	1.59	1.6	1.4	1.4	1.6	1.2	1.3	1.5	1.5	1.6
Cucumber	.53	.63	.66	.78	1.02	1.03	.73	.72	.71	.62	.68
Pumpkin	1.8	2.5	2.8	2.2	1.9	2.1	1.7	1.8	1.9	2.0	2.3
Hot Peppers	.37	.59	.79	.6	.5	.5	.46	.41	.5	.54	.68
Sweet Peppers	.18	.21	.34	.43	.41	.60	.3	.26	.32	.33	.37
Thyme	.16	.16	.16	.12	.13	.17	.14	.14	.2	.16	.23
Escallion	.54	.73	.83	.64	.51	.79	.5	.57	.69	.5	.98
Papaya	.15	.14	.17	.17	.17	.22	.25	.24	.55	.31	.5
Pineapple	.59	.48	.57	.52	.49	.51	.59	.57	.27	.61	.58
Plaintain	.24	.22	.24	.24	.23	.22	.21	.7	2.0	2.0	1.8
Sorrel	.41	.51	.63	.8	.58	.59	.37	.39	.49	.57	.57
total	16.8	19.3	21.6	21.5	21.1	22.9	20.3	18.6	24.4	23.9	25.2

Source: Data Collection and Statistics Branch, Ministry of Agriculture

The export volumes for the selected crops are shown in Exhibit 15. This information is of particular importance because of the structure of the market for fresh produce in Jamaica which forces the food processor to compete with the export brokers and the higglers who sell on the local market for a share of the output.

In more developed countries, and in those developing countries such as Brazil, Costa Rica, Malaysia and the Philippines which were described as market leaders in the production of pre-cut fruits, juices and purees and dried fruits, there are systems of grading in place which ensure that the best grade product is reserved for export, the second grade product are sold on the local market and the third grade product is processed. This allows for different prices to be obtained for each grade of product and for a more orderly and efficient process of marketing.

In Jamaica however, there is no formal system of grading and buyers in all three markets must therefore compete for the same produce. The price and demand in one market therefore has an influence on the prices and available volumes in the others.

The information presented in Exhibit 15 suggests that there has been a significant increase in the export of papayas, plantains, calaloo and peppers and mangoes. While a detailed analysis of the implications cannot be carried out without additional information on the volumes consumed in the local markets and the conversion rates for the processors, exhibit 15 suggests that a large part of the increase in production shown in exhibit 13 which has resulted has gone into the export of fresh produce.

Exhibit 15

Exports of Non-traditional Crops 1987-92

	'000 kg					
	1987	1988	1989	1990	1991	1992
Total	18,105	13,995	9,408	11,854	15,185	18,493
Yams	10,493	9,535	6,972	8,565	9,570	11,051
Breadfruit	248	196	68	143	400	363
Calaloo	115	113	116	131	157	239
Carrots	.3	.5		.14	.23	.75
Cucumber	323	404	72	138	126	122
Pumpkins	1,184	775	829	938	1,198	1,710
Hot Peppers	2.8	93	151	167.5	244	420
Sweet Peppers	72.8	64.9	12	40.9	-	17
Thyme	38	53	66	67	81	111
Escallion	21	21	23	23	23	30
Avacado	105	27	15	44	70	108
Mango	495	570	293	435	1081	1152
Papaya	200	421	215	495	1,401	1738
Pineapple	1.2	5.1	.3	1.9	1.4	6.1
Plantain	106	31	107	127	202	426
Naseberry	12	17	11	10	15	8
Starapple	1.4	1.3		1.64	.63	1.1
Sorrel	14.6	2.7	10.0	7.7	14.6	30

Source: Data Collection and Statistics Branch, Ministry of Agriculture

Exhibit 16 and 17 provide information on the relationship between reported farmgate prices, the local market prices and the export prices (where available) for two of the crops used by local processors - papayas and calaloo. The information for calaloo suggests an average markup by the higglers of 59%. This appears to be reasonable given the current cost of transportation and the cost of rental of market stalls etc.

The markup for papayas is somewhat larger, averaging 95% between the farmgate and the market and 125% between the farmgate and the export market. The higher markup in the local market in this case possibly reflects the additional costs of packing which is necessary to prevent bruising of the fruit etc. The additional markup in the export price would almost surely reflect the additional packaging cost including cartons etc.

Exhibit 16
Comparison of Farmgate, Market and export Prices of Papayas

	1983	1984	1985	1986	J\$/kg 1987	1988	1989	1990	1991	1992
Farmgate Prices	0.64	0.66	0.84	1.10	2.01	2.27	2.98	3.43	5.27	8.39
Market Prices	1.39	1.43	2.01	2.60	3.46	4.10	5.69	5.84	8.60	11.79
Export Prices						5.28	4.11	6.87	11.84	27.61

Source: Data Collection and Statistics Branch, Ministry of Agriculture

Exhibit 17
Comparison of Farmgate, Market and export Prices for Calaloo

	1983	1984	1985	1986	J\$/kg 1987	1988	1989	1990	1991	1992
Farmgate Prices	0.73	0.82	1.17	1.26	1.48	1.90	2.07	2.76	4.17	7.79
Market Prices	1.15	1.3	1.65	2.16	2.36	2.87	4.01	4.45	6.64	10.67

Source: Data Collection and Statistics Branch, Ministry of Agriculture

Based on the above, the following observations can be made:

1. If the food processing industry is to take advantage of the opportunities identified in section 3 and is to have sufficient materials at the appropriate price there will need to be an increase in the acerages under cultivation and further improvements in the yield per acre for the crops.
2. There is a growing need for an organized grading systems which will separate crops for export from those suited for the local market and those for processing. This will be in the

interest of all three customer groups and will allow the processors to access materials adequate for their purposes at a price which is not in competition with the exporters.

3. Both (1) and (2) above argue for a greater level of cooperation between processors and farmers. New approaches need to be explored to achieve a greater level of trust and collaboration between the two groups.

IVB. The Packaging Sector

The packaging sector plays a critical supporting function to the food processing sector. By itself, it contributes 8% of the total manufacturing value in the country. It is populated by a number of large industrial enterprises and is a major employer of industrial labour.

The sector however faces a number of important challenges. Among them:

- The need to be responsive to changing packaging needs of the food processing sector. As noted in section 3, new materials and new designs are needed by the food processors if they are to compete effectively in international markets. The packaging needs are of two types. The first requirement is for individual containers, the other for new forms of bulk packaging utilizing the most modern technologies.
- the need to adjust to the deregulation of the Jamaican economy. By reducing the tariff barriers, the programme of deregulation has given rise to an increase in the number of competitors as firms located in neighboring Caricom countries and in the United States, Dominica Republic and South America now find it easier and more economical to enter the Jamaican marketplace. The local producers need to respond by improving the quality of their products and reduce their costs in order to meet the challenges of these international competitors.
- the need to respond to global ecological trends. Concerns for the environment have grown substantially over the past several years. Issues such as the disposability and reusability of packaging have become areas of concern, and must be addressed by the local packaging manufacturers.

The ability of the sector to respond to these challenges is influenced by the fact that the sector is populated by a number of large firms many of which are subsidiaries of large international firms that have displayed little interest in increasing their investment in Jamaica. Others are captive suppliers for large firms in the beverage and cigarette industry. These firms use their excess capacity to supply the local food processors. Because these firms are not their primary customers, the packaging suppliers have been slow to respond to the changing needs of the sector.

To better understand the nature of the problems, we briefly review the major sectors of the packaging industry. For this purpose, there are four basic packaging formats, with firms specializing in one of each of these - glass containers, metal containers, plastic containers and folding cartons.

Glass Containers. There is only a single producer of the glass containers used by firms in the food processing sector. This firm is owned by two large firms in the alcoholic beverage and soft drink

industry. Over 80% of the firms output goes to supply the demand of its principals, with only 20% dedicated to the needs of the other processors.

The firm operates on a three shift per day basis. Defect rates are high (of the order of 20-25%) even when the plant is in steady state.

Colour changeovers require 3 days of downtime. Consequently, the production runs of a single colour are long, typically of the order of 6 weeks.

Mould change overs, which are required to change the shape and size of the container being produced, are also long. Mould changeovers require 16 hours. Typically therefore, production runs of a single product are very long. The firm produces only 66 different shapes and sizes of glass containers.

Mould are purchased from the United States and Europe and are quite expensive. The acquisition cost is typically beyond the means of most small and medium sized food processors.

The plant has a utilization rate (including changeovers) of 100%. The level of responsiveness to the needs of the firms in the food processing sector is influenced by this fact.

One consequence of the above is that all but the largest processors are required to purchase at least one years supply of containers at a time. This serves to increase their inventory carrying cost and working capital requirements at a time when interest rates are at a record high (see exhibit 4).

Metal Cans

There is one primary supplier of metal cans to the food processing sector. The firm is a subsidiary of a large U.K. firm. The firm produces only 12 sizes and shapes of containers.

Changeover between different sizes of containers required 3 shifts, and the run in time after change overs reportedly requires 5 or more shifts. Consequently, run lengths are long - of the order of 2 million containers.

The firm has downsized and reduced its labour force considerably, but is losing market share to sister firms located in other Caricom countries and to firms operating out of the United States and its associated territories.

Plastics

The plastic containers subsector is populated by a few large players and several small firms. The larger players produce a range of products on several production lines, using a mix of plastics and processing technologies.

The key limitations of the subsector include the following:

- there is limited investment in new product development
- the mould making capacity of the sector is low, and consequently many of the moulds are purchased from overseas and are very expensive. This serves to limit the extent of innovativeness in packaging formats used by the food processors.
- the investment in r&d and in developing a knowledge of the newest types of plastics is

limited

there is very little focus on new forms of bulk packaging such as would be required to support the export of fresh pre-cut fruits and vegetables.

Folding Cartons

This subsector is populated by a few large players. The processing facilities of these large firms is inflexible. The focus is on a narrow range of products. Many of the machines are old and inflexible. The production techniques are old.

By contrast, firms in the Eastern Caribbean have invested more heavily in upgrading their competencies and the flexibility of their processes. One such firm is Ensopak which operates out of Barbados. This firm was recently established by a Finnish firm with a long history in pulp and paper and related folding carton industries. The factory has been equipped with up to date machinery, include auto-cutting and in line retrogravure process which engraves by metal cylinder rather than the rubber plates used by the large Jamaican firms. The plant is designed to print from rolls rather than sheets and uses modern heat dried materials. The firm is reportedly stealing market share from the large Jamaican folding carton firms.

There are however some bright spots in the Jamaican subsector. For example, one new firm which employs 25-30 employees and annual sales of about \$10 million utilizes a variety of modern equipment and process control techniques. The firm supplies folding cartons and labels to a number of food processors on a Just-in-time basis, shipping on a monthly basis (or less). The firm is equipped with a modern five colour printing press, and has an internal plate making capability. It is therefore able to deal directly with the processors, taking original art work and converting it through all of the intermediate stages into plates which can be attached to the printing press. The firm has invested in Computer Aided Design (CAD) capabilities to increase the speed of process in an effort to be more responsive to its customers. The use of computers also makes it possible to store negatives for further modification and use at the request of its customers. The firm has a very high sales to employee ratio, makes very good use of space and in spite of paying its employees well is reported to be very cost competitive with overseas suppliers.

From the above it is clear that considerable investment will be required if the sector is to assist in the development of the food processing sector. The investments required in developing the appropriate intellectual assets with a knowledge of the appropriate state of the art techniques may be much greater than the capital investment requirements.

It is also clear that the situation is not without hope. Firms in the folding carton and labels subsector and those in the plastics subsector such as thermoplastics and Wsynco who are investing in the development of state of the art machine shops and mould making capabilities provide encouragement. These efforts however need to be encouraged and enhanced.

V. Conclusions

In this paper we have reviewed the current state of the food processing sector in Jamaica. Several observations can be made:

1. the industry is populated by a large mix of firms of varying sizes. The production facilities of most of these firms are underutilized. The largest component of cost is for

materials and packaging, followed by overheads. Labour represents a comparatively small component of cost for most of the processors.

2. Some processors are better equipped, by virtue of their scale and scope of operations, to produce products for the ethnic markets, others for the mainstream markets.
3. Opportunities exist in both areas and should be pursued. In the ethnic markets, opportunities exist for crossing over into specialty products. In the mainstream, opportunities exist in a number of areas. Three of these were examined - precut fruits, juices, purees & concentrates, and dried fruits and snacks.
4. If advantage is to be taken of these opportunities, considerable attention will have to be place on ensuring that there is an adequate supply of raw materials. This will require the establishment of an acceptable grading scheme for the produce and a new level of cooperation between processors and growers.
5. Considerable investment will be required in the area of packaging. In particular there is the need to enhance the creativity of the sector and to develop competencies in new materials and in techniques for processing these materials to produce attractive single containers and sophisticated bulk packs.
6. The earning potential of the sector is excellent.

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

April 1994

Project for the Government of the
Jamaica

Job Description

DP/JAM/88/009/17-04/07-2000

Post title: Symposium Co-ordinator - National Expert

Duration: 2.0 w/m

Date required: As soon as possible (starting 11 April 1994)

Duty station: Kingston (Jamaica)

Purpose of project: To establish an Agri-Food Processing Unit at JAMPRO capable of providing information and advisory services to the food industry and simultaneously selected services.

Duties: As part of the end-of-project activities the consultant will organize an Agro Industry Symposium to review the opportunities and constraints for the development of the sector. The consultant will work with the Processed Food Unit at JAMPRO. Through this forum the consultant will:

- (a) explore possible solutions and strategies for the development of the sector, taking into consideration the weaknesses already identified;
- (b) review models of development and propose development strategies for the industry;
- (c) research the international market and explore the potential for specific products/product groups; highlight the international bench marks of the global market and assess Jamaica's state of readiness for the markets;
- (d) prepare a reference document of the sector highlighting the market opportunities identified.

Prepare a final report on the findings of the symposium including recommendations for the development of the sector.

Qualifications: A minimum of 5 years of experience in organization and management and a post graduate degree in economics and business administration.

Language: English.

Background information:

The agro-processing industry constitutes the main manufacturing sub-sector in Jamaica, contributing approximately 34% of the total manufacturing production value and employing approximately 21,500 persons or, over 20% of the workforce in the manufacturing industry. The food processing component of the sub-sector accounts for approximately 15% of the total manufacturing production. In the latest sub-sector survey, conducted in 1983, 72 agro-processing firms were registered. Approximately 50 of these are food processing plants. However, the bulk of the firms are small and medium-scale enterprises with annual sales of less than J\$ 6.0 million. The predominant technology is labour-intensive.

The sub-sector suffers from high unit production cost, low capacity utilization, outdated and inappropriate equipment and production lay-out, high factory down-time, poor product quality, inadequate packaging, poor marketing and weak management. The supply of local raw material is very unstable and over 50% of the raw material is imported with only a very limited amount of locally grown tropical fruits being currently processed.

Agro-industry is one of seven priority sub-sectors for attention in the Government's modernization of the industry programme, a major element of the Government's overall structural adjustment efforts. The Government is aiming at strengthening the competitiveness of the sub-sector to become a main exporting and import displacing industry. Through increased export earnings, particularly from hard currency markets, and foreign exchange savings, the sub-sector is foreseen to contribute to the improvement of the balance of payment situation. By developing new investment opportunities and productive activities, the Government is aiming at attracting new technologies, skills and markets to Jamaica which, in turn, will strengthen the dynamics of the sub-sector and create employment.

The Food Technology Institute, under the direction of the Scientific Research Council has the responsibility to conduct R & D activities in the field of product development and to provide related services.

The Jamaica Bureau of Standards is charged with the responsibility to provide services in the field of quality control, i.e. documentation, consultancy, training and testing and certification of samples. The newly established JAMPRO (Jamaica Promotions Ltd.) combines the services previously provided by the now merged

Jamaica National Export Corporation (JNEC), Jamaica National Investment Promotion Ltd. (JNIP) and Jamaica Industrial Development Corporation (JIDC). The services are provided in the fields of export promotion, investment promotion and technical assistance. These services are provided to the industry in general.

JAMPRO, as the Government agency to promote agricultural development, has been chosen by the Government to also become the focal point to encourage and assist with market-led business development and enhance the technical and managerial development of the agro-processing industry.

COMMENTS OF THE PROJECT BACKSTOPPING OFFICER

Prof. G.V. Shirley was hired as national expert and given a 2 months contract to organize a symposium on the agro-industry in Jamaica in order to review the opportunities and constraints for the development of the sector.

He prepared and presented within the above symposium this excellent paper reviewing the food processing sector in Jamaica and giving the opportunities and challenges which the country is facing in the export markets.

It can be said that this report is a valuable contribution to the achievements of the project. It is considered as reference paper for those who are interested in investing in Jamaica in the food industry sector.

The report is accepted by UNIDO as part of a set of reports already produced within the framework of this project and submitted to the Government.