

PN-AAR - 856

38266

**SURVEY OF THE SOMALI  
FOOD INDUSTRY  
AND ITS ABILITY TO IMPROVE  
UTILIZATION OF LOCAL FOODS**

**BY**

**GLENN W. PATTERSON**

**&**

**HASSAN NOOR FAHIYE**

**FOR**

**U. S. AGENCY FOR INTERNATIONAL DEVELOPMENT**

**CONTRACT NO. 649-84-0132-081**

**MOGADISHU**

**NOVEMBER 1984**

**BEST AVAILABLE COPY**

SURVEY OF THE SOMALI  
FOOD INDUSTRY  
AND ITS ABILITY TO IMPROVE  
UTILIZATION OF LOCAL FOODS

BY  
GLENN W. PATTERSON  
&  
HASSAN NOOR FAHIYE

FOR  
U. S. AGENCY FOR INTERNATIONAL DEVELOPMENT

CONTRACT NO. 649-84-0132-081

MOGADISHU

NOVEMBER 1984

# T A B L E O F C O N T E N T S

	Page
Preface .....	i
Introduction	
Purpose, Objectives, Scope of Work .....	1
Methodology .....	2
Overview of the Somalia Food Industry	
Background .....	4
Consumption/Marketing .....	5
Production of Locally Grown Foods .....	6
Imports .....	13
Existing Food Processing Operations .....	14
New Food Processing Possibilities .....	19
Recommendations .....	20
Bibliography .....	23
Food Industry Survey Results and Recommendations	
A EDIBLE OIL .....	A 1
B GRAIN MILLING .....	B 1
C PASTA .....	C 1
D BAKERIES .....	D 1
E DAIRIES .....	E 1
F VINEGAR .....	F 1
G SUGAR .....	G 1
H FRUIT .....	H 1
I BEVERAGES .....	I 1
J CONFECTIONERIES .....	J 1
K FRESH WATER FISH .....	K 1
L FRESH FOOD PRESERVATION AND STORAGE .....	L 1
M PACKAGING .....	M 1
N FOOD INDUSTRY SUPPORT SERVICES .....	N 1

PREFACE

In discussions with USAID staff in Mogadishu, it was learned that little information was available to guide them and other agencies on policies, programs or specific projects aimed at strengthening the Somali food industry. It was felt lack of this information also has inhibited the Somali government from making better decisions on how to assist the industry to make the desired shift to increased participation of the private sector and possibly upgrading public operations.

No known studies have been done specifically looking at the food industry's capabilities, inputs, outputs, domestic and import competition and problems preventing greater use of local foods, skills and facilities. Consultants Glenn Patterson and Hassan Noor Fahiyeh were asked to survey the food industry to obtain up to date industry description and develop recommendations for ways to help improve and expand its ability to use as many local resources as possible.

Three segments: ocean fish processing, meat processing and large scale sugar milling were not surveyed. Many studies, progress reports etc. have been done to give good historical and nearly up to date status of these operations. In addition international agencies, foreign investors and the Somali government are actively addressing the problems of these industry segments. The Ministry of Fisheries should be contacted regarding particulars on fish processing and the Ministry of Industry for meat and sugar.

Special appreciation and thanks must be given to the

following persons who assisted greatly in the research and writing of this report:

1. Abdullahi Mohamed Yusuf  
Director of Private Sector Department  
Ministry of Industry  
Mogadishu
2. Ali Omer Sheego  
Director of Public Sector Department  
Ministry of Industries  
Mogadishu
3. Ms. Sujatha Krishnan  
Research Assistant  
P. O. Box 2925  
Mogadishu  
Phone 22979
4. Hassan Farah Warfa  
Research Assistant  
College of Education, Lafoole  
Somali National University  
Mogadishu
5. Ms. B. Roy Choudhury - Editor  
P. O. Box 24  
Mogadishu  
Phone 20401

## INTRODUCTION

**Purpose:** To explore the ability of the Somalia food industry to improve utilization of locally available foods for income generation, nutritional improvement and import substitution.

### Objectives:

- A. To determine what foods harvested or planned for future production could be processed/preserved for domestic consumption or export.
- B. To determine present food processing/preservation related capabilities and problems inhibiting expansion or increased output of facilities.
- C. To develop recommendations for food processing/preservation interventions which could better utilize locally available food industry facilities.
- D. To develop recommendations for other food processing/preservation technologies which are not presently used or used to a very limited degree.

### Scope of Work:

- A. Identify type, quantity and seasonal availability of presently grown or harvested foods which are or could be processed/preserved using different levels of technology and production capacity.
- B. Identify future plans for increased production or presently grown or harvested foods or new food resources which could be processed/preserved.
- C. Identify quantity and type of imported foods which

now compete against the present Somalia food industry or which could be partly or completely locally processed/preserved using all or nearly all local resources and capabilities.

- D. Identify type and quantity of processed/preserved food now produced and capability, utilization, and condition of the facilities and equipment of existing food industry operations.
- E. Identify food processing/preservation related problems and other factors (lack of skills, equipment, etc.) which curtail the capability of certain portions of the food industry to produce more, different and better quality products and services.
- F. Develop recommendations on possible food processing/preservation interventions which would better utilize existing operations and skills.
- G. Develop recommendations on food processing/preservation interventions not now utilized but offer potential.
- H. Develop a bibliography of existing reports and list of contacts to guide future in-depth studies and projects.

### Methodology

Information and statistics presented in this report were taken from three sources (a) interviews (b) market studies and (c) library research. Formal and informal interviews were conducted to learn what Government, inter-

national agencies and private businesses are presently doing, problems encountered and future plans related to the food industry. Discussions were held with Ministries of Agriculture, Commerce, Health, Industry, and Planning; Somali Development Bank; Agricultural Development Corporation; National Trading Agency; public sector factory managers; UNDP; UNICEF; FAO; ILO; USAID; GTZ; World Concern; Africare; SAVE-USA; and over 75 private sector businesses in Mogadishu, Jowhar, Afgoi, and Hargeisa.

A market survey was conducted of importers, wholesalers, open market vendors to learn more about products, prices and the general market system for local and imported processed foods.

Library research was also carried out to locate surveys and reports relating to the food industry and to obtain additional background statistics and information.

This report has two sections. The first, a general overview of the food industry, includes background, raw food resources, imports, a summary of present food industry operations and future possibilities, and recommendations applicable to the entire industry.

The second section is divided into 14 parts one for each type of food processing done and/or allied industries. Each part is meant to be self-contained to serve as a basis for future study. Included, where applicable, is information on consumption/marketing; raw material production; imports; past, present and future status of processing done;

other processing possibilities; recommendations; bibliography; contacts and appendixes.

OVERVIEW OF THE SOMALI FOOD INDUSTRY

Background

*British Somaliland*

When the Somali Democratic Republic was formed from the Italian Somaliland in July 1960, it inherited virtually no industrial development. The only industries existing before independence were the Jowhar Sugar factory, Sopral meat factory, some cotton gins and oil mills in Jammaame, Shalambod and Mogadishu.

In 1960, a few projects such as the Tugwajale wheat project, Gelib state farms and the Laskoreh fish factory were set up. In some cases the country lacked the knowledge and skills to undertake proper pre-project planning and formulation to ensure profitability of the enterprise and these projects saw little success.

With the October 1969 Revolution, the Government looked at industrialization to boost overall production. The main objectives were:

- to raise the standard of living/provide employment opportunities.
- to boost production to satisfy domestic demand for manufactured/processed goods.
- to encourage import substitution thereby reducing the adverse trade imbalance.
- to make maximum use of local resources in all fields.

The government focused its development policy initially in the public sector. All existing enterprises were nationalized; also a number of new enterprises were established so that investments and projects could be channelled into socially desirable projects. Nearly all the enterprises were oriented to the domestic market. The idea was to process indigenous materials to provide the people with consumer foods and semi-manufacturers. Agencies like the ADC and ENC were set up to control domestic and foreign trade.

The ADC (Agricultural Development Organization) was founded in 1967 as the sole purchasing agency for maize and sorghum and was also responsible for providing farmers with the necessary inputs, for import, export, storage and domestic marketing.

The ENC (National Trading Agency) was founded in 1962 as the sole controller of imports and exports of basic consumer items such as cereals, sugar, etc.

Purchase and sale prices were fixed for a number of items to ensure availability of cheap basic consumer goods. This measure, however, proved unsuccessful. Prices in particular of food showed very high inflation rates during the 1970s.

To stem this undesirable trend, the government launched a new liberalization policy in favor of private ventures and curtailed the functions of the public agencies. This resulted in an increase in producer prices leading to a substantial

increase in production between 1980 and 1983 because earlier producers such as farmers had to sell their produce only to ADC at fixed prices which at times of unfavorable conditions were less than the input costs. When prices were liberalized together with freedom to farmers to sell in other markets, production increased.

Today the existing industrial enterprises can be put into two broad categories:

- small and medium size industrial units in the private sector mainly processing imported and local semi-finished inputs.
- large size industrial units in the public sector mainly resource-based agro-industries.

In the present Five Year Economic and Social Development Plan (1982-1986) Government industrial development policy clearly underlines the promotion of private industrial activity to encourage and allow private entrepreneurship and investment. The objectives are to divert sizable private investment from the traditional sectors, such as transportation, to productive industrial activity.

Thus the Somali Development Bank allocated in 1982 about So. Sh. 28.8 million for private sector investment and of the industrial investments approved that year the private sector received 46.5%.

Support is given where urgent problems exist and rapid results might be expected, depending on local conditions.

Possible areas of direct and indirect promotion that is given to small/medium size enterprises are:-

- Credit Finance: The Somali Development Bank extends up to 75% of the initial investment to some productive industrial units in the private sector. Most of the operating units in the urban areas have benefited from this credit financing.
- Tax Relief: Practically all enterprises are able to avail themselves of tax incentives on production, tax and customs exemption on imported raw materials and semi-finished goods. Medium units in the private sector industries may be given tax relief for the first years if financial problems arise.
- Protective Tariffs: It is common experience that local industrial products may not be able to successfully compete with similar imported items in the local market because of poor labelling, and the consumer may have preference for the imported products. The Government, therefore, imposes a protective tariff to increase the price of imported products or if necessary imposes quotas to restrict entry to the local market.

Like all developing countries, Somalia is in the early stages of development and offers industrial development opportunities in a wide variety of fields to meet the existing market demands. Naturally, it will be profitable to use indigenous raw material resources as far as possible. Import substitution industries are needed to minimize the

import bills. One of the guidelines of the government industrial policy is the concept of import substitution. The main manufacturing branches for import substitution are those for which there is a resource base, e.g. agricultural products.

Consumption/Marketing

Consumption of nearly all processed foods is expected to increase for the following reasons, if not for others:

- Increase in per capita income, population, and mobility.
- Changes in life styles with more persons moving towards urban areas and away from nomadic living.
- Exposure to Western and other developed country foods, likes, dislikes and efforts to imitate these.
- Efforts to look for more convenience in food preparation as more people, particularly women, taking jobs, have less time for food production. Cost of preparation, fuel costs etc. may also go up.

Increase in consumption will inevitably lead to increase in demand but if past and present trends are any indication, availability of resources will be lacking to allow supply and subsequent consumption to meet demand. Till date, with the domestic market failing to satisfy consumer demands, the import of foodstuffs has increased sharply in recent years from 12.2% of total gross import in 1979 to 23.0% in 1982 and is expected to increase further. The ratio of food imports to total export earnings in 1982 was 96.8%. It seems fairly positive that investments in the domestic

food industry should prove fruitful if inputs from agriculture and necessary imports are made available.

The market structure is many times very complex and difficult to trace. Many middlemen are involved in moving processed foods or even processed food ingredients from the initial processor to the ultimate consumer. Wheat, it is understood, passes through at least five middlemen before pasta made from wheat flour and semolina is purchased by consumers.

The importation of many food and ingredients through the FRANCO VALUTO system and other means makes tracing that market structure even more difficult let alone control.

The primary market objective is to produce and distribute locally processed foods of a quality and price which will encourage consumers to purchase local rather than imported foods. Prices of locally processed foods are usually lower than imports (vegetable oil being one example to the contrary). Government imports tariffs help to make this possible through distribution and pricing policies regarding exports and imports and incentives for producers and processors. These are aimed to increase domestic production especially agro-industry products and to promote import substitution and export development.

Production of Locally Grown Foods

Table A shows while a variety of foods are grown in Somalia many are not being processed/preserved or offer potential for commercially viable food industry applications.

TABLE A  
PRINCIPAL SOMALI GROWN FOODS

FOODS (Generally available)	COMMERCIALY PROCESSED/ PRESERVED NOW	COMMERCIAL POSSIBILITIES		
		OFFERS POTENTIAL Small Amts. Done now	Worth Exploring	OFFERS LITTLE POTENTIAL
	(1)	(2)	(3)	(4)
Oil Bearing crops				
Sesame	✓			
Coconut		✓		
Sunflower		✓		
Safflower		✓		
Cotton seed		✓		
Groundnuts			✓	
Grains				
Maize, Sorghum + Rice	✓			
Legumes				
Cowpeas, green grams and soyabeans			✓	
Animal Products				
Milk-Cow	✓			
Camel			✓	
Goat		✓		
Meat-Cow	✓			
Camel	✓			
Goat + Sheep	✓			
Chicken				✓
Fresh Water Fish		✓		

FOODS (Generally available)	COMMERCIALY PROCESSED/ PRESERVED NOW	COMMERCIAL POSSIBILITIES		
		OFFERS	POTENTIAL	OFFERS
		Small Amts. Done Now	Worth Exploring	LITTLE POTENTIAL
Fruit				
Banana			✓	
Dates		✓		
Grapes			✓	
Grapefruit		✓		
Guava		✓		
Lime		✓		
Orange				✓
Papaya			✓	
Pomegranate		✓		
Soursop			✓	
Sea almond			✓	
Tangerine				✓
Tamarind		✓		
Vegetables				
Beans				
Beets				✓
Cabbage				✓
Cassava			✓	
Cucumber				✓
Egg plant				✓
Lettuce				✓
Maize (green)				✓
Okra				✓
Onion				✓
Pepper				✓
Potato (white)				✓
Potato (sweet)			✓	
Pumpkin				✓
Radish				✓
Spinach				✓
Zucchini				✓
Pepper (red)		✓		
Garlic				✓
Stapes				

Those foods listed in columns 1, 2, and 3 are more fully discussed in later parts of this report.

Listed in column 4 are those which offer less potential because they (a) are not available in sufficient quantities to justify the expense of processing, e.g. oranges, tangerines, garlic, etc.; (b) are more cheaply processed or prepared at home, e.g. chicken, certain vegetables; (c) require a high level of technology to produce safe products e.g., certain vegetables; (d) in their fresh forms are more acceptable to most consumers and nutritionally provide more vitamins and minerals than their processed counterparts - e.g., certain vegetables.

Production of principal crops shown in Table B indicates that total yields have increased for many crops but dry weather and many other reasons pointed out in chapter 6 of the Five Year Development Plan 1982-1986 have not allowed increases to take place for all crops as rapidly as planned.

TABLE B  
PRODUCTION OF PRINCIPAL CROPS  
IN SOMALIA  
(Metric Tons 000)

CROP	1981	1982	1983	1984
1. Maize	142	150	235	282
2. Sorghum	222	235	120	144
3. Rice	19	20	2.8	8
4. Beans	10	15	20.5	33
5. Sesame	51	57	59	NK
6. Groundnut	4	3.2	2.6	5.8
7. Sugar cane	420	535	500	NK
8. Fruits & Vegetables	35	102	83	174
9. Banana	69	72	85	85

Note: a) Source - Ministry of Agriculture  
b) 1984 Projected yields  
c) NK - Not known

The Five Year Development Plan 1982-1986 describes the objectives and strategies to increase the production of the agricultural sector. Somalia has seen increases in production in the first half of the 5 year plan. The food industry, having considerable capacity to use this increased production, needs to be geared to take advantage of that capacity by having the other necessary inputs: fuel, spare parts, containers, technical know-how, etc. These will help to use the increased agricultural production, efficiently and effectively.

#### IMPORTS

Value of imports for 1981/82, shown in Table B, indicate some food categories which make up a sizable portion of the foreign exchange needed to import vital foods.

TABLE B  
IMPORTS OF FOODS 1981/82

Item	1981		1982	
	Value (000) (So.Shs)	%	Value (000) (So.Shs)	%
Meat	130	.02	849	.11
Dairy	36,000	5.90	149,000	18.05
Fish	122	.02	230	.03
Cereals	431,000	70.40	503,000	64.03
Fruit & Vegetables	12,000	2.00	10,000	1.28
Sugar	81,000	13.20	38,000	4.82
Beverages (non-alcoholic)	2,500	.41	15,000	1.92
Oil seeds, etc.	107	.02	71	.10
Fixed vegetable oils + fats	49,000	8.00	73,000	9.17
Essential oils	380	.06	380	.49
	612,239	100.00	782,530	100.00

-----  
Note: Source: Ministry of Planning

These high imports may continue because of dry weather in spite of efforts to increase food production through cultivating more land, and increasing yields through various agricultural improvement programs.

It is also obvious that much effort needs to be put into reducing those high hard currency expenditure items such as cereals, sugar, vegetable oils and fats and dairy products. While all of these are good sources of energy and to a lesser extent other nutrients, there are several foods grown here which offer good substitutes for those imports.

The 1981 figures on domestic and imported input content in food manufacturing support the view that given the necessary backing the locally grown food industry is capable to meeting to a large degree consumer demand. Whilst domestic inputs in the food manufacturing sector in 1981 was 91.3% imported input was 8.7%.

EXISTING FOOD PROCESSING OPERATIONS

Table C summarizing information about the existing food industry shows per cent utilization of installed capacity to be low. However, the private sector seems to make better use of capacity than the public sector.

TABLE C

## FOOD INDUSTRY IN SOMALIA

## SUMMARY OF OPERATIONS SEPT. 1984

Type/owner of Operation	Operations			Major Raw Materials	Products	Capacity	
	Number	Employees	Start up date			Installed	% Used
EDIBLE OIL							
Oil Mill - Mog. (PB)	1	68	1976	Sesame seed (L)	Sesame oil	50 TD	0
Private Mills throughout Country	260-285	2-4 ea	Variable	Sesame seed (L)	Sesame Oil	each	30-60
GRAIN MILLING ADC (PB)							
	4	20-35	1974	Maize (L) Sorghum (L) Wheat (I)	Meal, Flour, Bran	8-10 T/d each	25-50
	3	ND	1977	Rice (L)	Polished rice Bran	8-10 T/d each	30-50
Flour + Pasta Factory Mog. (PB) (see also Pasta)	1	200	1976	Wheat (I)	Flour, Semo- lina, Bran	100 T/d	80
Private Mills throughout country	200-250	2-4 ea	Variable	Maize (L), Sor- ghum (L)	Meal (soor) Flour (Anjeero)	2-1.0 T/d each	70-80
PASTA							
Flour + Pasta Factory Mog. (PB)	1	100	1976	Semolina (I) Flour (I)	Long + Short Pasta	55 T/d	70-80
Private 1. Mogadishu	1	15	1981	Semolina (I) Flour (I)	Short Pasta	2 T/d	50-70
2. Mogadishu	1	15	1981	"	"	2 T/d	50-70
3. Mogadishu	1	10	1980	"	"	1.5 T/d	0

Table C contd.....

Type/owner of Operation	Operations			Major Raw Materials	Products	Capacity	
	Number	Employees	Start up date			Installed	% Used
<b>BAKERIES</b>							
Public	3	10-20	NK	Flour(I) Sugar(I)	Bread	2-4 T/d	40-80
Private	20-125	3-20 each	Variable	Oil(L+I) Yeast(I)	Bread, cakes, pastries	0.2-4 T/d	60-75
<b>DAIRIES</b>							
Mogadishu (PB)	1	NK	1966 (see note)	Milk (L) Dry milk (I)	Milk	22500 l/d	NK
Hargeisa (PR)	1	NK	1985	Dry milk (I)	Milk	28350 l/d	NK
Private	10-15 Cheese 15-20 Ice cream	2-5 ea	Variable	Milk (L)  Dry milk (I) Sugar (L +I)	Cheese, Yogurt  Ice Cream	Variable	40-70
<b>VINEGAR</b>							
Private	2	10-15 ea	Variable	Acetic Acid (I) Flavors (I)	Vinegar	800/d	40-60
<b>SUGAR</b>							
JSP - Juba (PB)	1	1775	1980	Sugar Cane (L)	Sugar, molasses	65,000 T/yr	50-55
SNAI-Jowhar (PB)	1	1731	1927	Sugar Cane (L)	Sugar, alcohol	40,000 T/yr	0
Private	3	8-10 ea	1984	Sugar Cane (L)	Sugar, molasses	4.5-5.0 T/d	15-20
<b>FRUIT</b>							
ITOP (PB)	1	70	1972	Tomatoes (L)	Tomato paste	150 T/d	20-30

Table C Contd.....

Type/owner of Operation	Operations			Major Raw Materials	Products	Capacity	
	Number	Employees	Start up date			Installed	% Used
FRUIT (contd.)							
Private 1.	1	8	1984	Mango (L)	Mango juice	540 l/d	33-45
2.	1	10-15	NK	Sugar (I) Color (I) Essence (I) Flavor (I)	Fruit flavored sugar syrups	150-260 l/d	40-60
BEVERAGES							
Coke-Mogardishu (PR)	1	175	1968	Syrups (I)	Coke, Fanta, Sprite	430 case/hr	40-60
Pepsi-Mogardishu (PR)	1	75	1981	CO <sub>2</sub> (L+I)	Pepsi, Teem Mirinda	400 case/hr	20-30
Pepsi-Hargeisa (PR)	1	70	1977	Sugar (I)	Pepsi, Teem, Mirinda	150-175 case/hr	30-50
Coke-Hargeisa (PR)	1	NK	1985		Coke, Fanta, Sprite	750 case/hr	NK
ALBA (PR)	1	30	NK	Sugar (I+L) Flavor (I+L) CO <sub>2</sub> (I)	Mandarin, Ginger, Apple Tamarinda	84 case/hr	60-75
CONFECTIONERY							
Private	1	40	1974	Glucose (I), Sugar (L), Essence (I), Citric Acid (I) Colors (I)	Hard candy (6 flavors)	10 T/d	10-15
FRESH WATER FISH	1	NK	1984	River fish (L)	Fresh, smoked & dried fish	NK presently catches about 1-2 T/d	NK

Table C contd.....

Type/owner of Operation	Number	Operations		Major Raw Materials	Products	Capacity	
		Employees	Start up date			Installed	% Used
MEAT							
Sopral (PB)	1	77	1960	Cattle (L)	Canned beef, stewed steaks, gelatin, meat extract	NK	0
Kismayo (PB)	1	303	1968	Cattle (L)	Same as Sopral + frozen meat	200 H/d	70-80
Mogadishu Slaughter House	1	NK	NK	Sheep + Goats (L), Cattle (L), Camel (L)	Fresh meat	340 H/d	NK
Private	50-70	3-10	Variable	Cattle (L), Camel (L), Sheep & Goats (L)	Fresh meat	NK	NK

NOTE: a) PB = Public owned, PR = Private owner, NK = Not known, L = Local, I = Imported

b) Mogadishu dairy raw material; products and capacity and information based on projections after renovations are completed in 1984.

## New Food Processing Possibilities

Primary emphasis should be placed on assisting the existing food industry to move production output closer to installed capacity. There are, however, other food processing operations which are not presently done but should be explored. These could produce extensions to existing product lines or new products by new companies. Some of the more important include:-

Coconut oil

Composite bakery and pasta flours

Bakery yeast

Cheese rennet

Fermented vinegar

Sugar of various grades to meet industry/consumer needs

Dried fruit, jams, jelly

Citric acid

Essential oils

Pectin

Confectioneries using more local materials

Dried/salted fresh water fish

Glass/plastic bottles and bottle caps

## Problems Facing the Food Industry

Most problems faced by the Somali food industry are not much different than those of other industries. These problems include:

- Lack of hard currency to purchase equipment, spare parts, imported raw materials and expertise/information.

- Lack of capital for initial investment and expansion. Bank loans are difficult to get, interest rates high and repayment terms difficult.
- Lack of technical know-how, trained staff and information, necessary import inputs and export markets.
- Lack of some local raw materials and infrastructure to obtain them.
- Having to compete with retail and in some cases the wholesale market for raw materials and other necessary inputs thus increasing costs.
- Frequent breakdown of electricity supply and lack of fuel.
- Lack of financial incentives account for the shortage of qualified staff.
- Public enterprises pay far too less to the producers to attract adequate supplies.

Recommendations

Specific recommendations are given for each processing sector described later in this report. Below are general recommendations applicable to the entire food industry.

A. Access to Hard Currency: - It is fully realized that there is very limited hard currency for the large number of persons/businesses requesting it. For this reason, the following recommendations are offered to help make better decisions based on accurate and relevant information to justify issuing letters of credit (LC).

1. Somali Government Action

Review and update existing criteria for selecting

LC recipients. This criteria should include a cost/benefit analysis involving not only cost/benefits to the immediate recipient but also those to local suppliers (farmers and other industries), merchants and consumers. For example, providing LC's to sugar factories to get equipment/spare parts for producing more sugar thus enabling fruit processors needing sugar to utilize excess local fruits for making fruit juice, jams, etc. which in turn will help reduce imports, create jobs and provide lower priced and possibly more nutritious products to consumers. A similar example can be given for importing wheat instead of flour to better utilize existing milling capacity for producing flour, semolina and bran which in turn increases utilization of bakery and pasta factories to produce lower priced, better quality products. The grain also helps feed animals leading to increased milk and meat production.

2. USAID Commodity Import Program (CIP) Action

To make CIP more useful to the food industry, technical and follow-up assistance should be provided to:

- a. Help specifically identify the quantity, quality and other specifications necessary for imported inputs.
- b. Find suppliers in "free world" countries or the U.S. with emphasis given to "free world"

purchases.

- c. Facilitate contacts with technical expertise and information to make good cost/benefit selections of inputs and use of inputs once received.
  - d. Increase CIP staffing to provide more in-depth assistance to those preparing proposals. This also includes site visits to better judge justification for requests and ascertain how the requested inputs once received are used.
- B. Review existing Commercial Bank credit program and develop means to bring its procedures and objectives in line with the country's development policy of providing more assistance to the private sector.
  - C. Set up a Somali consultant group to provide assistance to food industry members for preparing feasibility studies, conducting market research, providing technical assistance, facilitating contacts with government, international funding and joint venture investment groups.
  - D. Review needs of Ministry of Industry to see what specific technical, marketing, training and financial inputs are needed to enable more and better assistance to be given the food industry.
  - E. Emphasis should be given to assisting the following industries which offer potential for bringing most benefits to Somalis.
    - edible oil
    - grain milling
    - sugar

- Fruit
- Packaging

Improving their capacity to produce more and better quality helps reduce imports of products directly competing with these industries. Assistance also makes more locally produced ingredients available to the local pasta, bakery, vinegar, beverage, and confectionery industries.

- F. Conduct an up-to-date specific resource analysis to identify the types, amounts, quality, marketing system, etc. of raw foods which could be/are processed.
- G. Conduct export market research in Gulf States, Italy, Kenya, Germany and possibly elsewhere to ascertain markets for raw, semi-processed or processed products. Raw and semi-processed foods will find markets easier because of less tariff restraints and lobbies in buying countries.
- H. Explore feasibility of turning over public sector food processing operations not making good use of capacity to private sector investors/companies.

#### Bibliography

- A. Daoud, H. N.: Back to Office Report - Syria, Jordan, Somalia, September 21 - October 14, 1983, Report for FAO Mogadishu, 29p.
- B. FAO: SOMALI DEMOCRATIC REPUBLIC - Report of the FAO/WFP Mission, Assessment of the Food, Agriculture and Live-stock Situation, January 1984, 25 p.
- C. Hummen, W., Gasten, N., Susanne Gura, Hippler, N., Meinarius, M.: The Private Manufacturing Sector in

Somalia. German Development Institute, September 1984,  
263p.

- D. Shawki, M. K.: FAO and Agricultural Development in  
Somalia, March 1984, 9p plus annexes.
- E. Somali Democratic Republic - Ministry of Planning, Five  
Year Development Plan 1982 - 1986, Mogadishu, 1982,  
369p.
- F. Somali Ministry of Industry, Conference on Industrial  
Development and Management - Report on the Proceedings  
October 4-6, 1982, Mogadishu, 140p.
- G. Somali Ministry of Industry, Investment Promotion  
Conference - Report on the Proceedings, November 6-9, 1983,  
Mogadishu, 104p.
- H. UNIDO: The Potential for Resource - based Industrial  
Development in the Least Developed Countries No. 6  
SOMALIA, UNIDO/ 15.426 December 16, 1983, 20p.

## A EDIBLE OILS

### Consumption/Marketing

The demand for edible oil in Somalia is met in part by:

- local production of mainly sesame oil.
- import of a variety of refined vegetable oils/fats  
crude oil, oilseeds and oilnuts.

Consumption estimates of edible oil in metric tons, reported in 1971 were 8800, 13,400 for 1975, 21,000 for 1977 and 33,600 for 1984. Whilst earlier reports used different per capita values, a more realistic estimate was made in 1977 of 6.3 kg. per capita consumption. The estimate for 1984 assumed a population of 4 million with a growth rate of 2.6%. However, the population is now estimated at 5.3 million with an increase of 3.05% per year. This gives an estimated consumption of 44,520 metric tons and per capita consumption of 8.4 kg. It must be remembered that about 50% of the Somali population, being nomadic, are relatively small users of edible oil, the main users being from the urban and rural regions comprising of 24% and 26%, respectively. FAO foresees an increase in demand of 3.6% to 4.5% per year - about 3% for population increases and 1% for increased usage due possibly to increased availability and more favourable prices.

It is, however, important to note that the increase in demand has affected the price pattern. In August 1983, locally produced sesame oil sold for So. Shs. 70 per litre and imported vegetable oil for So. Shs. 19 per litre. For the corresponding period in 1984, the prices were So. Shs. 180-205 and So. Shs. 100-110, respectively.

Consumers normally furnish the containers (cans, bottles, etc.) when purchasing edible oils. They purchase the locally produced sesame oil directly from private manufacturers whilst the imported oil is purchased from retailers who buy in bulk from importers/wholesalers and in turn dispense it into the consumers containers in quantities ranging from 1/4 litre upwards.

#### Production of Locally Grown Raw Materials

There are two seasons of crop production, the Gu and Dayr seasons. The Gu season, running from March to June, produces lower yields of sesame than the Dayr season, which runs from September to November and usually has lower rainfall levels. Production of sesame seed and other principal oil seeds grown in Somalia is shown in Table A.

TABLE A

#### PRODUCTION IN METRIC TONS: PRINCIPAL OILSEEDS OF SOMALIA

<u>Crop</u>	<u>1984</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>
Sesame	51,000	57,000	59,500	50,000
Groundnut	5,000	3,200	2,600	4,000
Cotton seed	4,000	7,400	4,000	5,000

Note:

- a. 1984 - estimated figures
- b. Groundnuts are not processed into oil but consumed directly
- c. Cotton seeds are used mostly as seedstock for replanting
- d. Source: Ministry of Agriculture

Other locally grown crops which could be or are minor contributors to oil production include:

- Coconut - Almost the entire crop is eaten in wet, green or water stage; only a small amount is allowed to mature to copra stage and small amounts of copra are processed to produce hair oil.
- Sunflower - At present produced in very limited quantities, but a World Bank project is exploring its potential in the Lower Shebelle region (Kunton-warrey).
- Safflower - Under the same World Bank project as sunflower, it is produced as a Dayr season crop. It yielded 5 quintals per hectare during the last 2 years. It is a dry land crop rotated with cowpeas.
- Castor beans - These grow wild in many parts of Somalia; no domestic cultivations are known to be operating, but some have been planned.
- Jojoba is now grown in small quantities in the Lower Shebelle region by a local businessman and in north-western Somalia but no processing is done at present.

#### Imports

Importations of fixed oils and fats, shown in Table B for 1981/82 show an increase in the value of foreign exchange spent.

TABLE B

## IMPORTS - FIXED VEGETABLE OILS + FATS 1981/82

DESCRIPTION OF ITEMS	1981		1982	
	QUANTITY (KG)	VALUE (SO.SH.)	QUANTITY (KG)	VALUE (SO.SH.)
Fixed vegetable oil and fats	19,834,677	49,350,507	7,232,988	72,906,228
Soya bean oil	54,833	5,572,322	2,439,712	40,843,731
Cotton seed oil	29,020	116,935	NR	NR
Groundnut(peanut) oil	157,390	787,127	NR	NR
Sesame oil	1,225,945	5,767,178	200	1,200
Other fixed vegetable oils, fluid or solid, crude, refined or purified	18,358,343	37,068,907	1,025,979	6,300,342
Coconut oil	1,679,189	7,933,278	125,061	1,047,886
Fixed vegetable oil, n.e.s.	16,675,647	29,121,529	900,878	5,252,336

Note: a. Source: Ministry of Planning  
b. n.e.s.: Not elsewhere stated  
c. NR : None Reported

It should be noted that data for quantities are not believed to be as accurate as the data for values. Data for 1982 is believed to be not as complete as that for 1981. Tables B and C (given later) are meant primarily to indicate type of items imported and the data to indicate in general some relative information on amounts within each year and not between years.

1983 and 1984 import data was not available at the time this writing, but imports are expected to increase due to low

rainfall resulting in low farm production. The reduction in quantity in 1981/82 may have partly resulted from a certain portion of refugee oil rations being channeled back into the local market system, thus reducing imports. The import data shown on Table B does not include the amount of edible oils imported for the refugee program.

Imports of oilseeds, oil nuts and oil kernels shown in Table C indicate most are not used for edible oil extraction purposes.

TABLE C  
IMPORTS OF OILSEEDS, OILNUTS AND KERNELS 1981/82

DESCRIPTION OF ITEM	1981		1982	
	QUANTITY (KG)	VALUE (SO.SH.)	QUANTITY (KG)	VALUE (SO.SH.)
Oil-seeds, oil nuts and oil kernels	31,960	106,990	3,077	70,390
Oil seeds and oleaginous fruit whole or broken of a kind used for extraction of soft fixed vegetable oils	31,215	102,555	40	280
Oilseeds or kinds used for extraction	NR	NR	3,037	68,610

Note: a. Source: Ministry of Planning

b. NR : Non Reported

A UNIDO report in 1983 outlining demand projections, shows that a deficit of 109,000 metric tons of oilseeds existed in 1981 and a deficit of 131,000 would exist for 1986.

EXPECTED CONSUMPTION AND SOURCES OF EDIBLE OILS - 1984

	Metric Tons
Consumption (8.4 kilogram per capita 5.3 million population)	44,520
Local production	
Sesame 50,000 metric tons at 40% oil yield	20,000
Other oilseed (safflower, cotton, groundnut) (estimate only)	2,500
	<hr/>
<p style="text-align: right;">TOTAL</p>	22,500
	<hr/>
Needed as imports	22,020
Expected Title I + II imports	9,860
Other imports needed	12,160

This data clearly indicates the need to increase local oil seed production, processing capacity and efficiency of presently operating oil mills.

Processing - Past/Present/Future

Somalia has for many years imported edible oil both cooking and salad oils to meet demand that local production could not meet. Many studies and projects have been carried out to achieve self-sufficiency. Though much progress has been made, a lot remains to be accomplished.

According to available publications, efforts to upgrade and expand the edible oil industry in Somalia first began in 1961 with plans for a groundnut mill. Activity increased during the 70's and early part of the 80's as evidenced by: reports on production and processing of castor beans and

other oil seeds; cotton seeds; reviews, surveys and feasibility studies of the entire industry and specific reports on the public sector factory in Mogadishu. Recent pre-feasibility studies are: (a) for a public sector factory by the Arab Industrial Development Organization and (b) for a private company. Results of both surveys are expected to be available within the next four months.

Until 1981, the public sector had monopolistic control of all oil processing. The Agricultural Corporation was responsible for all marketing and off-farm storage of cereal grains, sesame, groundnuts, sunflower and cotton seeds. Small private oil mills were not encouraged and the only processing was what they could obtain, sometimes illegally, from farmers or grow themselves. In 1971 there were 70 motorized mills in Mogadishu, 40 in other parts of the country, and an estimated 520 camel powered mills throughout the country,

By 1983 the monopolistic control was reduced to allow for price liberalization and the subsequent revival and expansion of private sector mills. A brief survey of private oil mills in Mogadishu and discussions with the Ministry of Industry as well as individuals knowledgeable about oil mill operations in Somalia reveal a substantial increase in the number of oil mills as shown in Table D.

TABLE D

OIL MILLS IN SOMALIA

TYPE, NUMBER, LOCATION + PRODUCTION

Oil Mill Type	Number	Location	Approximate Production (quintals per 12 hour shift)
a. Japan made			
H 50	40-50	Mogadishu	3-4
	30	Other Regions	3-4
H 52	20	Mogadishu	3-4
H 54	110	Mogadishu	6-7
	50-60	Other Regions	6-7
X 100	10	Mogadishu	7-8
b. Taiwan made	2	Mogadishu	7-8 or more
	2	Afgoi	7-8 or more
c. Italian made	1	Mogadishu (at public edible oil factory)	not known
d. Animal Powered	4	Mogadishu	1-2
	26	Other Regions	1-2

- Note: a. Japan mills made by Hander Oil Machinery Corp.,  
          OSAKA, JAPAN.
- b. Taiwan mills made by Ching Tien Ta. Industries Co.  
          Limited, TAIPEI, TAIWAN.
- c. Italian mill manufacturer not determined.
- d. There are four other expellers in the public oil  
          factory but their origin and production capacity  
          were not determined.

## A. Private Mills

Most private mills use Japanese made HANDER model H54 screw type expellers and process about 6 quintals of sesame per shift, yielding 180 to 240 litres (30 to 40% extraction). Lower oil yields are a result of poor equipment and operational inefficiencies as well as low oil content of sesame, especially that grown during the Gu season. Sesame seeds, now selling for So. Shs. 7000 to 8000 per quintal, are purchased from wholesalers and farmers or are raised on the farms of the oil mill owners.

In processing, first the sesame is sieved to remove dirt, sand and other particles larger and smaller than the seed. Often sand remains and when put through the expeller causes excessive wear to the worm, collar and barrel blades. No roasting or additional drying is done prior to expelling.

The mills operate 180-200 days per year with one or two shifts, depending on availability of sesame and operating condition of the expeller, filter, pump or motor. Operating staff usually includes: the owner/manager, an equipment operator and one or two other persons.

Problems: Other than lack of raw materials, the major barriers to increasing production are problems with the parts on the expeller, pump and motor. The expeller worm and collar need to be built up and remachined about 2-3 months at a cost of about So. Shs. 1000. This work has to be done by a speciality workshop in Mogadishu. The barrel blades or liners, which need replacing every 1 to 4 years, are imported through

a local importer. He says parts are available nearly all the time but are very expensive. Two HANDEH H 54 operators said they could double production if spare parts were less costly and thus more readily available.

Some filter pumps are difficult to repair locally, due to lack of spare parts and/or knowledge to repair them. Electric (12 HP) or diesel (16 HP) motors have the usual problems or maintenance and repair. Electric power cuts, low voltage and high diesel fuel costs and availability also reduce productivity.

#### B. Public Sector Mill

There is one public sector edible oil factory, located in Mogadishu. It was completed in 1975 and started production in January 1976 with an installed capacity of 20 metric tons per day in 3 shifts, to process sesame, sunflower, cotton seed and copra.

In 1976 the factory operated at 86% of its capacity, reaching its highest level of production. Efforts were made to increase production to 50 tons per day in 1978. However, production dropped during the period 1979-1980. The main problem was the equipment, most of which are second hand and very old. In 1981-82 crude oil was imported to increase the output. However, since the last quarter of 1983 the factory has not operated at all. Based on a 300 day work year today, if the factory were to meet a capacity of 50 tons per day, it would use 15,000 tons of sesame seed, producing 6000 tons of oil or about 13.5% of the expected 1984 consumption of oil. tons.

A visit to the factory and meeting with the managing director indicated a need to reassess the factory's ability to compete against the private sector mills. Some of the major problems or causes for the factory's failure or lack of success are:

- lack of adequate equipment

Major equipment presently in need of assessment and possible renovation include 2 cotton seed delinters, 2 seed crushers, a vibratory seed cleaner, 5 expellers (only 3 are operative) and oil filtering and refining equipment, (some of which was updated by FAO in 1980) and 2 HANDEH H54 expeller which are used occasionally.

- lack of spare parts
- lack of trained professional and technical personnel
- lack of appropriate quality control and sanitation programs
- inadequate supply of raw materials, containers and packing materials
- overabundance of old, outdated equipment
- low price of So. Shs. 450 per quintal for purchase of sesame caused farmers to sell to private mills and thus obtain higher prices.

One of the major problems in increasing local edible oil seed production is lack of adequate production of oil bearing crops. Low yielding and shattering varieties, low rainfall, inadequate inputs of seeds, fertilizer, pesticides, etc., and poor pricing and credit system have all hampered increased

production. The Ministry of Agriculture in its 1984 Annual Development Plan outlines steps to overcome some of these constraints.

In the private sector one Somali businessman has ordered two Indian made expellers capable of producing 1000/litres/day of sesame oil.

A Somali importer has just imported 10 expellers from Taiwan (of which 3 have already been sold) and 40 Japanese HANDE Model H 64 expellers. These will sell for So. Shs. 422,000 and 1,100,000 respectively and will include filters and pumps but not motors. This importer also plans to start an edible oil factory in 1985 to process 15-20 tons of oil seeds/day. A prefeasibility study just completed for this factory can be available to parties interested in assisting in this venture. Plans for the factory also include a farm to supply sesame, groundnuts and sunflower seeds to compensate for the present shortage of raw materials. Imports of sesame seed will continue until the farm can produce adequate quantities.

The management at the public sector factory in Mogadishu wants a feasibility study conducted to determine what can be done to make the factory more competitive with private sector operators.

Recommendations (in order of priority)

- A. Conduct market research to determine up to date consumption levels, uses and overall demand for all edible

oils particularly cooking oils.

- B. Review present progress on current activities to increase oil seed production and assess future plans to determine constraints that may prevent objectives from being achieved. Determine inputs needed to overcome constraints.
- C. Determine cost-profit margins for farmers. Devise pricing systems which will encourage farmers to increase production.
- D. Identify ways to prevent imported oils from reducing local oil mill processors (a) profit margin to unacceptable levels, and (b) their inability to purchase raw materials, equipment, spare parts, fuel, etc.
- E. Conduct a needs/resource assessment of the private sector oil mills to determine specific reasons for the low production of milling operations with a view to provide technical assistance and training on how to operate, maintain and repair the equipment and improve yields.
- F. Explore feasibility of importing raw oil seeds acceptable to Somalis for better utilization of private sector operations.
- G. Determine feasibility of increasing production and diverting groundnuts and coconuts for oil extraction.
- H. Carry out market research with concept and prototypes to determine acceptability of edible oils not presently familiar to Somali customers. For those not acceptable explore strategies to incorporate in the diet through processed foods such as confectionery products, bakery goods, ice creams, etc.

- I. Explore potential of using under utilized expeller equipment to produce castor and other oils not now being processed. Develop plans for uses of these oils in items such as soap, paints, lubricants, medicines, hair oil, etc. for domestic use or export.
- J. Survey existing uses of presscake to determine cost effectiveness of using solvent extraction to remove additional oil before feeding to animals.
- K. Determine feasibility of a small cooker-extruder operation to obtain oil from imported unmilled rice bran.
- L. Review feasibility study carried out for public sector oil factory to determine how adequately it is dealing with the problems of low productivity and competitiveness with the private sector. If research findings are inadequate, conduct a study.

#### Bibliography

1. Bird, Kermit: Market study of the edible oil industry in Somalia. UNDP/UNIDO Project SOM/72/007 Technical Report, January 1979, 19p.
2. British Cotton Growing Association: Somali Project, Feasibility study on cotton ginnery and oil mill, Mogadishu Afgoi-Mordille Irrigation Agency 1973, Various pages.
3. CITACO SPA: Survey on supply and demand of edible oil in Somali. Summary report, Mogadishu, December 1971, 22p (also in Italian).

4. CITACO SPA: Oil Bearing Project, CITACO, 1972.
5. CITACO SPA: Present and future programs of the Somalia oil industry, 1973 (also in Italia).
6. CITACO SPA: Considerazioni Sulle culture oleaginose in Somalia in visita del programma ragguingimento del auto sufficienza e dei i avvio di ua oleificio industriale, Mogadishu 1974, 17p;
7. CITACO SPA: Program of Interventions for the Development of Oil Bearing Crops, Rome, April 1975, 88 p;
8. Daoud, H.N: Back to Office Report, Syria, Jordan, Somalia September 14 - October 14, 1983, 29p.
9. FAO: Development of Oil Seeds and Beans Production 1977 + June 1983 (note see FAO/Mogadishu Office for 1983 Reports).
10. FEE - CEE: Progetto oleaginese, Mogadishu, Febbraio 1972, 43p;
11. Fritz, Werner: Oil mill for groundnuts, Capacity 30 and 75 tons milled groundnuts in 24 hours. Berlin, Marienfeld, 1961, 8p + 1 chart.
12. Hummen, W., Gasten, N., Suzanne Gura, Hippler, M., Meinardus, M: The Private Manufacturing Sector of Somalia, German Development Institute, September 1984, 163p.
13. IFAGRARIA Executive Project for an agricultural enterprise to produce castor bean and other oil seeds in the territory of Audigle. Volume 1 - Summary, Volume 2 - Basic Studies, Volume 3 - Hydraulics and Infrastructure Studies, Volume 4 - Agronomic Study, Volume 5 -

Economic Study, Volume 6 - Maps and Technical drawings, Mogadishu, Ifagraria, 1978.

14. Jamhuuriyadda Dimuqraadida ee Soomaaliya Warshadda Saliidda ee Xamar warbixin gaaban, Mogadishu, 1976  
2p (short, English summary available) Report on Edible Oil Factory 1976, 2p.
15. Miner Thomas H. and Associates, Inc: Feasibility study for a vegetable oil industry in the Republic of Somalia, Mogadishu, 1968, 62p.
16. Semida, John: Study of 50 Small Scale Industries which can utilize Local Raw Materials in Somalia, USAID/ Mogadishu, August, 1984, 11p.
17. Somali Democratic Republic, Ministry of Agriculture Department of Planning and Training: Annual Development Plan "Agriculture Sector", January 1984, 36p.
18. Terlizzi, Paul: Review of the oil seed industry sector in the Somalia Democratic Republic and a feasibility study covering the processing of 50MT/day of cotton seed to produce cotton seed oil and oil cake.
19. UNIDO: The Potential for Resource Based Industrial Development in the Least Developed Countries No. 6 Somalia, UNIDO/ 15.426, December 16, 1983.
20. UNIDO: Industrial Sector Review - Somalia Report prepared for the Ministry of Industry, December 1977, 71p.
21. Watkins, K. M: Short survey of the vegetable oil mill Mogadishu UNDP/UNIDO Project DO/SOM/72/007 Technical Report, February 1976, 10p.

Contacts

- A. Adde - Hander oil expeller owner and sesame  
seed famer  
Bakaraha Market, Mogadishu
- B. Abdillahi Yusuf (Buulo)  
Director of Private Sector Department  
Ministry of Industry, Mogadishu
- C. Abdirahman Omar Abdi, Repair Mechanic  
and Mohamoud Mohamed Ali (Gudhle)  
Expeller Service Mechanic  
c/o Ali Daud Workshop  
Behani - opposite Cinema Behani  
Shibis - District, Mogadishu
- D. Amir - Hander oil expeller owner  
Shibis Market, Mogadishu
- E. Andrew Hayman, Resident Representative  
World Bank, Somalia
- F. Arab Essa Haid - Jojoba farmer  
P. O. Box 822  
Via Burgao, Mogadishu  
Phone 21969
- G. Hashi Haji Weheliye, Manager - Oil expelling  
equipment importer  
Haji Weheliye and Sons Company PTE, Ltd.  
Mecca All Mukarama Street, P. O. Box 1265  
Mogadishu, Phone 22539
- H. Hussein Abdulle Alasow  
General Manager, Public Sector Edible Oil Factory  
21st October Road, Mogadishu, Phone 22701

- I. Ibrahim Ali Omar Sheego  
Director of Public Sector Department  
Ministry of Industry, Mogadishu
- J. Ibrahim Osman Hassan  
Inspector of Cotton Farms  
Cotton Development Department  
Somaltex, Balad
- K. Mohamed Abukar Mahad, Oil expelling equipment importer  
Xamar Weyne, Via Roma, Mogadishu  
Phone 20414

Note: Major Sesame Producers in Afgoi District could be contacted via Mr. Ali Deria, District Coordinator, Ministry of Agriculture in Afgoi.

1. Ali Mohamed Omar
2. Haji Abdullahi Buue
3. Haji Mohamed Malaq
4. Haji Mayow Ikow
5. Haji Osman Haji
6. Isaq Abukar
7. Mukhtar Abdurahman
8. Mohamed Sabriye

Other Useful Contacts

1. Lincoln Young - Agricultural Advisor  
to Refugee Agricultural Unit. Knowledgeable  
about many aspects of Somali Agriculture
2. Dr. Michael Von Boguslawski  
Advisor to Mr. Abdullahi Seek Ali, Director  
of Planning for Ministry of Agriculture

## B GRAIN MILLING

### Consumption/Marketing

The primary cereal grains milled and eaten in Somalia are maize, sorghum, rice and wheat with consumption standing at 27, 18, 14 and 13% respectively. Per capita consumption data was not available. A number of popular local foods such as condensed porridge (soors), a thinner porridge (mishaaro), boiled grains (ambuulo), breads (anjero and mofoo), whole toasted or fried grains (daango) and yeast raised baked breads and cakes, biscuits and sweet pastries, use different levels of these grains and their flours or meals.

Marketing is done through a variety of channels involving farmers, wholesalers, importers, retailers and government agencies as well as donor agencies. It is beyond the scope of this report to go into the marketing system but the reader is referred to Ministry of Agriculture, ENC (National Trading Agency), ADC (Agricultural Development Corporation), USAID and other donors for details.

Retail prices for various grains and grain preparations for comparative times in September 1982, '83 and '84 are given below:

<u>Item</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>
Maize	4.73	8.37	35.78
Maize Meal	6.50	8.00	15.39
Sorghum	5.27	7.34	31.94
Rice	9.33	16.39	31.62
Wheat Flour	7.72	14.27	38.78

Source: Ministry of Planning

From this it is obvious that efforts should be made to make better use of locally grown grains to keep consumer prices from rising further and to reduce imports and hard currency expenditure.

Production of Locally Grown Raw Materials

Table A shows production of major locally grown cereal grains.

TABLE A  
PRODUCTION OF MAJOR CEREAL GRAINS & LEGUMES  
IN SOMALIA

CROP	<u>PRODUCTION (Metric Ton 000)</u>		
	1981	1982	1983
Maize	142	150	235
Sorghum	222	235	240
Rice	19	20	28
Legumes (cowpeas and green grams)	10	15	20.5

Imports

A substantial amount, 70% and 64% for 1981 and 82 respectively, of the total value of foods imported, was made up of cereals and cereal preparations shown in Table B.

TABLE B

## IMPORT OF CEREALS + CEREAL PREPARATIONS

1981 - 1982

DESCRIPTION OF ITEM	QUANTITY (KG)	VALUE (SO. SH.)	QUANTITY (KG.)	VALUE (SO. SH.)
Cereals and cereal preparations	115,113,729	431,190,649	152,366,891	502,641,399
Wheat and spelt (including meslin) unmilled	356,753	3,079,800	22,689,096	28,860,788
Rice	17,282,041	56,121,765	86,793,814	228,023,869
Rice in the husk or husked but not further prepared	16,983,160	55,447,649	86,793,702	227,911,769
Rice, husked but not further prepared (Cargo rice, brown rice)	16,983,160	55,447,649	79,444,550	203,850,086
Rice, semi or wholly milled whether or not polished or galzed (including parboiled or broken rice)	289,881	674,122	112	112,100
Rice, semi or wholly milled whether or not polished or galzed excluding broken rice	19,167	57,418	NR	NR
Broken rice	297,714	616,704	112	112,100
Barley unmilled head	7,994,221	10,388,466	72,000	288,177
Maize (corn) unmilled	54,293,991	96,345,091	8,661,420	10,801,547
Cereals, unmilled other than wheat, rice, barley and maize	8,846	30,968	1,998	900,000
Millet (white)	7,750	22,200		
Other cereals, n.e.s.	1,096	8,768		

Note: a. Source: Ministry of Planning  
b. n.e.s.: Not elsewhere stated  
c. NR : None reported

TABLE B contd.....

DESCRIPTION OF ITEM	QUANTITY (KG.)	VALUE (SO.SH.)	QUANTITY (KG.)	VALUE (SO.SH.)
Meal and flour of wheat and meslin	31,270,154	245,721,081	18,453,195	105,610,137
Flour of wheat or of meslin	31,269,517	245,718,841	11,727,795	75,598,529
Meal and groats of wheat	25,000	30,000	NR	NR
Cereals, milled except wheat and flour	300	3,600	NR	NR
Cereal preparations including preparations from flour and starch of fruits and vegetables	3,906,458	29,499,882	15,695,368	128,156,881
Noddles, vermicelli and similar preparations	3,582,340	16,480,982	4,791,229	126,088,726
Bakery products (bread, biscuits, cakes, etc.)	298,321	2,745,112	300	4,787
Bread, ships' biscuits and other ordinary bakers wares	14,047	109,351	30	869
Pastry, biscuits, cakes and other ordinary bakers-ware	284,274	2,635,761	270	3,918
Preparations of cereal flour and starch for food, n.e.s.	26,762	273,788	988,324	1,804,674
Preparations of flour, starch or malt extract, used as infant food or for dietolic.	18,010	191,834	781,607	1,346,820

Note: a. Source: Ministry of Planning  
b. n.e.s.: Not elsewhere stated  
c. NR : None reported

## Processing - Past/Present/Future

Grain milling in Somalia is conducted at three levels: household, community and regional/multi-regional. Each has: (a) its own methods of processing; (b) type of products produced; and (c) problems peculiar to it preventing greater output.

Household level: Though not a commercial operation, household level grain processing, as described in a 1982 report on traditional food processing practices, accounts for an estimated 14% or more of the locally grown grains milled. In nearly all cases hand powered tools are used. In the last few years hand powered metal plate grinders have been imported from Kenya and possibly elsewhere to help increase output and reduce operator time and energy inputs. These have found mixed acceptance with most people, mostly women operators, who find them too time/energy consuming. These are most suited for producing dry ground cereal meals and coarse flours whereas some more traditional methods such as pestle and mortar can produce wet ground cereals as well.

Little or no work has been done to modify the metal plate mills as done in other countries to increase output with less time and energy input. Wet milling could possibly be done as well but field tests would be necessary.

Community level: This level of milling takes place in privately owned shops with at least one shop in every town and several located near each other in open market

20

areas of large towns and districts e.g. Mogadishu. The procedures used, description of the two basic types of motor (diesel or electric) driven mills, nearly all made in Mogadishu, and technical feasibility is described in a 1984 report.

It is estimated about 200-250 metal plate mills for making soor and 175-200 roller millstone machines are operating at present each mill having a capacity of 750-1000 and 200-350 kilograms per shift respectively. These operations provide a very useful service to people who don't have hand operated mills or time and energy to mill grain themselves. Customers bring their own grain, maize or sorghum to the shops where it is ground and returned to them for a service charge, So. Sh. 1-2 per kilogram for soor and So. Sh. 2-3 for anjeero. Primary problems described by both present owners and local manufacturers include:

- power cuts and/or fuel cost and availability
- difficulty in getting spare parts, mostly bearings, although nearly all other parts are made locally
- wearing out of metal plate grinders and cylindrical millstones.

Repairs can be made with semi-skilled persons and this, coupled with local availability of nearly all parts, make these mills more feasible than imported models.

Regional/Multi-regional level: These milling operations use Italian or German commercial size roller mills and accessory equipment for milling maize, sorghum, rice and

wheat. Most have capability to separate out the bran from the endosperm giving varying levels of extraction and thus different grades of flour and/or meal from maize, sorghum and wheat and whole rice grain.

1. Agricultural Development Corporation (ADC) started operating 4 mills in 1974: one each in Hargeisa, Burao, Baydahabo and Kismayo. These were used primarily to process maize meal and sorghum purchased from farmers through ADC and imported donated wheat. Capacity now is 8 ton/shift for 3 mills and 10 tons for the Burao mill. They operate about 6-8 months per year with one shift only and employ 20-35 persons using imported soft wheat. About 50% is milled to flour, 30-40% bran and 10-20% semi-coarse flour or meal. Wheat costs So. Sh. 1000 per quintal and the flour, bran and meal from it are sold for So. Sh. 1380, 340 and 500 per quintal respectively to retail outlets and bakers.

Estimated utilization of capacity is between 25-50% depending on the particular mill. Principal problems reducing utilization of capacity include:

- insufficient quantities of grain
- lack of spare parts, fuel, etc.
- need for more technical know-how for operating, maintaining and repairing equipment, proper milling techniques, especially for soft wheat and other ways to reduce milling losses
- general upgrading of equipment and facilities.

2. ADC since 1977 has operated 3 more mills: 2 in Shalambod

and one in Gelip milling only locally grown rice. Capacity is 8 - 10 tons per shift but, since only 20,000 to 28,000 tons of rice were produced last year, maximum utilization of capacity has been only 2 to 5 months per year, after the harvest season. Rice bran is sold for animal feed.

3. Mogadishu Pasta and Flour Mill: Major efforts to establish a larger scale commercial wheat mill started in 1971 with pre-feasibility and feasibility studies. In 1976 the Somali Development Bank financed a mill in Mogadishu which was expanded in 1981 to a capacity of 1000 quintals per day in 3 shifts. Present utilization of capacity is about 80% depending on quantity, type and quality of wheat received. Good quality hard wheat allows the mill to get about 90% extraction whereas poor quality hard and soft wheats allow only 60 - 70% extraction.

Most wheat is donated but occasionally some is purchased in the world market. At times, donated wheat, of poor quality, reduces efficiency of the mill and subsequent quality of products made from the flour and semolina. The mill sells to ENC who in turn sells to wholesalers, retailer bakers and pasta makers. Bran is sold and used for animal feed.

Primary problems inhibiting more utilization of capacity include:

- insufficient quantities of wheat, especially good quality wheat
- lack of an efficient, effective import procurement policy eliminating middlemen

- lack of foreign exchange for spare parts

The mill appears to be maintained and managed well and, with means to overcome these problems, could contribute greatly to the availability of flour and semolina and subsequent increased production to other food industries such as pasta makers and bakers.

The mill has a sister mill in the same compound which produces pasta (see Part C Pasta of this report). Together they employ 250-300 persons depending on availability of raw materials.

Other Processing Possibilities

Composite flours - a blend of wheat flour and supplement flours from Somali grown crops - would not only make better use of local food crops but would help reduce wheat imports, provide employment and improve the nutritional value of certain food products. The recommended ratios of wheat flour to be blended with Somali crops are:

Wheat flour	70 - 95%
Supplement flour	30 - 5%

Somali grown crops which could be supplement flour sources include sweet potato, banana, cassava, sorghum, maize and legumes (cowpeas, mung beans). To be economically acceptable it is essential that the cost of supplement flour be equal to or less than wheat flour. To arrive at the supplement flour cost excluding labour and other processing costs and to convert fresh price per kilo to dried price



### Disadvantages:

1. Somalis, because of cultural and social reasons, may not accept food made with composite flours even though the quality of the food may be equal to products using 100% wheat flour.
2. The final cost of supplement flours after processing and blending with wheat flour must be equal to or less than wheat flour. This may be difficult as crops to make supplement flours may not be available or at suitable prices.

### Recommendations

#### Household Level

1. Survey traditional grain processing methods to identify costs, maintenance needed, operation, inputs, outputs, advantages and disadvantages. From this develop new or improved ways to reduce problems.
2. Improve metal plate grain mills so inputs are reduced and outputs and versatility (for both dry and wet milling) are increased. If these modified mills are acceptable, develop methods to make this equipment locally.

#### Community Level

1. Study manufacturing and operating techniques of locally made metal plate and roller millstone machines. Develop ways to reduce production, maintenance, repairs, operating costs and time.
2. Develop a system to improve availability of necessary

imported steel and other raw materials for manufacturing, including tools and equipment, and replacement parts such as bearings and springs.

Regional/Multi-Regional Level

1. Survey food industry users of grain flours and meals, especially wheat flour to determine quality and quantity needs for increased production of products which are cost/quality competitive to imported products or products for which a demand exists.
2. Conduct cost/benefit analysis to see which type of flour and, more importantly, wheat should be imported to meet industry needs and be most cost/benefit effective for the entire country. Efforts should be directed to imported wheat and not flour since unused mill capacity exists.
3. Provide hard currency to import cost/benefit effective type wheat or flours and spare parts reducing middlemen as much as possible.
4. Follow ADC/FAO project related to grain milling to:
  - monitor progress
  - provide inputs, where necessary, to meet objectives for upgrading milling technical know-how, equipment and facilities.

Composite Flours

1. Investigate experience of bakers and other users of wheat flour about using supplement/composite flours.
2. Develop prototypes/procedures for using locally grown

and processed supplement flours.

3. Develop and test concepts with users and consumers.
4. Market test prototype composite flours with Somali bakers, pasta makers and with consumers.
5. Conduct a feasibility study to determine the present and future potential in terms of availability, quality and prices of supplement flour sources, and overall feasibility of producing/marketing composite flours.

#### Bibliography

1. German Planning and Economic Advisory Group, Dr. Hendrikson: Establishment of a Milling Industry in Somalia, Pre-feasibility Study, Mogadishu, March 1973, 65 p.
2. German Planning and Economic Advisory Group: Feasibility Study on a Wheat Flour Mill for Northern Somalia, Mogadishu, February 1973, 44 p.
3. Hendrikson, K. H.: Feasibility Report on the Production of Banana Powder in Somalia (Date not known but believed to be about 1973, 53 p.)
4. Hummen, W., Gasten, N., Susanne Gura, Hippler, N., Meinardus, M.: The Private Manufacturing Sector of Somalia, German Development Institute, September 1984, 163 p.
5. Patterson, G, W: Technical Feasibility of a Motor Driven Grain Milling Operation for Qorioley Refugee Camps, Save the Children Federation, Mogadishu April 1984, 30 p.
6. Semida, John: A Study of 50 Small Scale Industries

which can Utilize Local Raw Materials in Somalia,  
USAID, Mogadishu, August 1984, 110 p.

7. Somali Democratic Republic (State Planning Commission):  
Vol. IV, Pasta and Wheat Flour Plant, Mogadishu,  
October 1976.
8. Techno Export: Offer No. 1290/63/71 for the delivery  
of a flour mill of a capacity of 25 tons/24 hours of  
processed wheat, 15 tons/24 hours of processed  
maize, Sofia 1971, 15 p + 10 charts.

#### Contacts

- A. A. H. Quereshi  
Project Manager  
Grain Storage and Pest Control Project  
FAO  
ADC Compound  
Mogadishu, Phone: 80788
- B. Abukar Moallin Mohamed  
Head - Department of Plant Production and Protection  
Faculty of Agriculture, National University of Somalia  
Afgoi
- C. Mohamed Farah Anshur  
General Manager  
ADC  
Mogadishu
- D. Osman Yusuf Farah  
General Manager  
Somali Development Bank  
Mogadishu

## C PASTA

### Consumption/Marketing

Pasta is one of the major staple foods of Somalis along with sorghum and maize. Per capita consumption, approximately 24-36 kilograms annually is estimated to be second only to Italy. However, the consumption pattern is not uniform. The main consumers are the urban and rural folks making up 26% and 24% respectively out of a population of 5.3 million. The remaining 50% are nomads and their pasta consumption has been comparatively low in the past. It is, however, increasing. Some reasons are:

- awareness of pasta as a food source
- scarcity of other foods due to drought
- overall development of the country

Refugees, estimated at about 600,000 in number, are the fourth category of consumers, each refugee intake being, according to a marketing report relating to refugee income generation opportunities, 36 to 48 kilos of pasta per year when supplies permit. This value seems high in view of the fact that distribution and availability are less favorable than for urban and most rural populations.

Most locally made pasta is bulk packaged at the factories in cardboard cartons of 10-20 kilograms and distributed to wholesalers for So. Shs. 16.5 to 20 or to retailers who, if they purchase from wholesalers, pay So. Shs. 25 and finally to consumers for So. Shs. 34, a price fixed by Ministry of Commerce based on production costs.

Pasta, imported mainly from Italy by importers is sold to wholesalers (price not obtained) who sell to retailers for So. Shs. 30 and then to consumers for So. Shs. 34 to 50. This pasta is usually more expensive than local pasta not only because it has to absorb transport costs but also government tariffs. It is generally of superior quality mostly because local manufacturers cannot get good quality flour and semolina. It was, however, expressed by one pasta maker and some retailers that Italy does now export low quality pasta into Somalia also.

Demand of private sector pasta is, at times very high, due to:

- decreased production of the only public pasta factory
- high prices of imported pasta
- overall shortage of semolina and/or wheat

#### Imports

Imports of pasta type products (noddles, vermicelli, etc.) were:

<u>Year</u>	<u>Metric Tons</u>	<u>Value in So. Shs.</u>
1981	3582	16,480,982
1982	4971	126,088,726

No explanation, other than operation of the FRANCO VALUTO monetary system, for the large value increase in 1982 is available. It should be noted that the above imports do not include wheat/flour imported for local pasta production.

Processing - Past/Present/Future

Apart from the four motor powered pasta operations in Somalia an unknown number of hand operated pasta machines are used in Somali homes/refugee camps for family consumption.

A study, conducted in 1968, indicated the feasibility of setting up a pasta factory in Somalia whilst a study in 1983 outlined potential spaghetti production by refugees using hand operated equipment. A study in 1973 indicated the feasibility of overhauling and improving out-dated equipment and other related problems at a private factory in Mogadishu. A recent study outlined inputs necessary to set up a long line pasta factory with a capacity of 3.2 quintal per hour. The Ministry of Industry plans to do a feasibility study.

Public Wheat Milling and Pasta Factory

In 1974, the Somali Development bank developed plans to construct a 330 quintal per day pasta factory. It started production in 1976. In 1981 the capacity was increased to 550 quintals, comprising of 550 quintals of long pasta (spaghetti, etc.) and 110 quintal of macaroni per day. The factory has maintained production targets meeting 20-30% of local consumption requirements.

In spite of problems relating to availability of semolina/flour in sufficient quantities and/or spare machine parts, the factory has made a profit and repaid its loan to the Somali Development Bank. Expansion plans include a long pasta production line of 30 tons per day capacity. Ins-

tallation date is not available.

### Private Sector Factories

There are two pasta factories owned by the same company, each with a capacity of 20 quintals of macaroni per day in two shifts. The production in actual terms is 15 quintals per day per factory. Both factories which had closed down since December 1983 for lack of semolina, reopened in October 1984. These factories mostly use semolina made from imported Durum wheat being milled at the public wheat milling factory which mills both hard and soft wheats.

The private pasta makers mostly mix semolina in a 50/50 ratio with imported flour which is usually received as aid and is of inferior quality. This reduces the quality of the locally made pasta. The managers, however, feel that even when the imported pasta is of a lower quality than that locally made with imported aid flour, consumers still tend to purchase the former.

Other problems faced by the private pasta makers are:

- total dependence on the public flour mill for semolina. This flour mill has a sister concern, the public pasta factory, which it gives priority to in terms of quality and quantity of semolina. It often sells inferior quality semolina from soft wheat to the private sector factories. This results in inferior quality pasta leading to reduced demands from consumers.
- electric power cuts

- bureaucratic process to get import license.
- lack of hard currency to purchase spare parts, equipment and good quality semolina/flour.

The third factory under this category, with a capacity of 15 quintals per day of macaroni, has not operated for nearly a year as the high cost of raw materials - semolina/flour, etc. - increased the cost of production making it impossible to sell at the price fixed by the Ministry of Commerce. The management hopes to purchase raw materials from the National Trading Agency (ENC) when prices are lower but was not sure when this would materialize.

A successful businessman in Hargeisa feels that the population of 250,000 in and around Hargeisa could justify a pasta factory there.

#### Other Possible Processing

One possible way to reduce dependence on imported semolina and other flours to make pasta is to blend these with flours made from locally grown crops such as cassava, banana, sweet potato, cereals and legumes. However, attempts by the public pasta mill to blend with cassava flour met with little success as consumers felt that addition of other flours lowered pasta quality and thus did not compare favorably with imported pasta. But in view of the increasing pasta prices - So. Shs. 15.00 in March 1983 to So. Shs. 58.77 in March 1984 - it is imperative that new technical know-how to make an acceptable pasta with some portion of other flours, should be made available.

## Recommendations

### A. Technical Assistance

1. Determine if local technical expertise is available to provide the necessary assistance to make acceptable pastas from the variety of available imported/local flours. If not available then expertise with up-to-date knowledge of new pasta making technology should be supplied.
2. Provide assistance to public/private pasta manufacturers and flour mills to obtain, both in terms of quality and quantity, adequate wheat/flour and semolina.
3. Provide hard currency to purchase raw materials, spare parts and possible new equipment.

### B. Use of Composite Flours for Pasta

1. Determine type, quantity, quality, price and availability of local crops which could be substitute flour sources. If favourable, conduct concept and prototype development and field testing of possible blended pastas directed to retail/institutional consumers.
2. If field tests show favourable results, conduct a study to determine overall feasibility of producing blended pastas.

#### Note:

Part B on Grain Milling of this report should be consulted regarding making better use of present milling operations and use of composite flour for baking and pasta making.

## Bibliography

1. CITACO SPA: Report on the Reservicing of Pasta Manufacturing Plant in Mogadishu, Mogadishu, January 1973, 24p.
2. Jirdeh Hussein & Company: Feasibility Study for the Manufacture of Pasta in Hargeisa, Somalia - Conducted for Ministry of Industry, 1983, 26p.
3. Miner Thomas H. & Associates, Inc.: Feasibility Study for Pasta Manufacturing in the Republic of Somalia, 1968, 90p.
4. Muttrega, Poonam: Marketing Report - Potentially Viable Income Generating Activities for Refugees in Somalia, May 1983 - available at ILO Office Mogadishu.

## Contacts

- A. Ahmed Haji Sahardeed  
General Manager  
National Pasta and Flour Factory  
P. O. Box 1299  
Mogadishu, Phone: 22461
- B. Mohamed Odey Omer - Private Pasta Maker  
Warshadda Pastada Hamar  
Shibis District  
Mogadishu, Phone 23130
- C. Warshadda Pastada Dalka - Private Pasta Maker  
Medina, Wada Jir District  
P. O. Box 696  
Mogadishu, Phone: 81933

## D. BAKERIES

### Consumption/Marketing

The primary bakery products consumed by Somalis are: two types of bread - a round elongated roll called "roti" and loaves French bread in the Northwest region), cakes, a few varieties of biscuits, cookies, dough nuts, and a wide range of sweet pastries. These are purchased to carry home from neighborhood bakeries and in tea shops. Many restaurants and institutions serve only bread. In September 1984, the price per roti was So.Sh. 2½-3 compared to So.Sh. 2 for the corresponding period in 1983. The 20 gm. French loaf sold for So.Sh. 2½ and then So.Sh. 8 over the same period.

Bakery sales drop at times as consumers switch to maize, Sorghum and pasta when these are plentiful and lower priced compared to bakery products.

Some tea shops, food stores, open market vendors, and other large users purchase bakery products directly from bakers. Most bakers sell at retail level at their bakery site or in other retail shops that they own.

### Imports

Imports of bakery products for 1981/82 listed in Table A indicate a substantial decrease in 1982. It is believed, however, that the 1982 data is not complete and that the Ministry of planning is still making additions to import statistics.

It should be noted that the Ministry's import list does not include yeast, baking powder, cooking oil and other ingredients used by bakers. It lists only those bakery products which compete against Somali bakers.

TABLE A  
IMPORTS OF BAKERY PRODUCTS

1981 - 1982

Description of Item	1981		1982	
	Quantity (Kg.)	Value (So.Sh.)	Quantity (Kg.)	Value (So.Sh.)
Bakery Products (bread, biscuits, cakes, etc.)	298,321	2,745,112	300	4,787
Bread, ships biscuits, and ordinary ba- kers wares	14,047	109,351	30	869
Pastries, cakes, biscuits and other fine bakers wares	284,274	2,635,761	270	3,918

Source: Ministry of Planning

Processing - Past/Present/Future

No reports or studies were found indicating any organized efforts to improve or increase the capacity of the bakery products industry. Whilst most bakeries are privately owned, the following government departments operate bakeries to supply to their staff and others under

their direction: the Ministry of Defence, Ministry of Education and possibly some others.

The capacity of bakeries varies from producing a few hundred to 40,000 rotis per day. Capacity utilized depends largely on two factors:

- availability of raw materials
- consumers demand which tends to divert to low cost and readily available foods like maize, sorghum and pasta, during particular months of the year.

For most bakeries, the production is about 5,000 - 10,000 rotis per shift. An alternate method bakers use for measuring production is by the number of quintals of flour used. A bakery survey showed that on the average 10-30 quintals of flour per 24 hours are used and the utilization of capacity was between 40-80%.

Equipment such as sifters, dough kneaders, dividing and rounding machines, ovens, etc. are mostly imported from France or Italy. Ovens are heated with electric, diesel, wood or a combination. Equipment breakdown, lack of spare parts and power/fuel shortage are some of the major problems that the bakery industry faces. Although now most of the bakeries have electric power generators, fuel shortage and non-availability of spare parts continue to pose serious problems.

The number of employees range from 3-30 depending on the availability of major inputs - raw materials, power, etc. It is difficult to get well-trained, reliable

staff. There are basically two reasons for this:

- low wages because of low production and subsequent low profits - high overheads
- night shifts in most bakeries

The bakery industry, as with most food industries, is adversely affected by the high cost, low availability and poor quality of raw materials which reduce production and sales. Among the most important ingredients which cause problems are:

Flour: Most of the flour imports are from the U.S.A, Canada, France and Italy. Some flour is produced by the ADC grain mills and the Mogadishu public flour mill from imported wheat. These flours are many times of a poor quality related mostly to the original wheat, storage, handling and milling. Sometimes poor grade flours are blended with good grade flours in the ratio of 1:1 to 3:1. Lack of hard currency prevents most bakers from importing good quality flour. Occasionally good quality French and U.S. flours are obtained through alternated ways. Normally, it is purchased from the government which obtains it from food aid programs of different kinds and also purchases from the world market. In 1984, a baker paid So.Sh. 50 kilos. Good quality flour is even more

expensive if and when available.

Sugar: Due to inadequate local supplies, imported refined sugar is mostly used. According to some bakers who were interviewed, some portion of local sugar could be used but they felt that the color of the local sugar which is not so white could influence color of the baked products and create consumer problems.

Salt: Local salt is used when available and its costs at So.Sh. 6-10 per kg. is more favorable than the imported, more refined quality which sells at So.Sh. 50-60.

Oil/Shortening: Sesame oil, locally produced, is preferred but high prices and low availability force bakers to purchase imported oil/shortening. Retail prices, which bakers often have to pay for raw materials, of local sesame oil, local ghee and imported vegetable oil are So.Sh. 200, 300 and 80 per liter respectively whereas imported 500 gm. margarine and butter sell at So.Sh. 60 and 80 respectively.

Oil is used in most of the baking formulas as well as for greasing baking pans to prevent baked products from sticking.

Yeast: All bakers use dry active yeast imported from France and India. In spite its being

such an important input, it is not always readily available and the quality, particularly from India, is poor. The price of yeast in the local market is Sh.Sh. 1500 - 1800 and in the black market, it is Sh.Sh. 3600/10 kilograms.

Milk: Since the quality and quantity of local milk is not favorable, imported dry whole or skim milk is used. Even when local milk is available, some bakers feel that water is added to it before it is sold to them, thereby reducing baking quality.

Other Ingredients: Most other ingredients used in sweet pastries, cakes, doughnuts and biscuits are imported. These include cocoa powder, chocolate, raisins, jams, canned and dry fruits, baking powder and some flavors. Eggs, though high priced, are purchased locally, when available.

Problems facing bakers are common whether in Hargeisa, Mogadishu or other towns but access to Djibouti and other Gulf States has helped to slightly reduce the problems of bakers in Hargeisa.

Most bakers are interested in obtaining know-how about making yeast locally. Interest was also shown in testing composite flours, discussed in Part B on Grain Milling. Presently, there is no one with either experience

or knowledge about composite flours.

The number of bakeries in Somalia is not known but is believed to be high compared to the number of consumers. This is one sector of the food industry which has a great deal of competition. However, problems with production inputs restrict their ability to compete favorably and possibly sell at lower prices. Those who are better managers and planners have succeeded in a higher utilization of capacity. Suggestions from three (3) bakers - two in Mogadishu and one in Hargeisa - point towards the government to give special consideration to bakers so that they do not have to compete against retailers and consumers for scarce inputs.

#### Recommendations

- A. Improve access to hard currency for those necessary imported items, e.g. sugar, flour, etc. which provide more benefits to the entire country through the their use by bakers than for direct consumption by consumers.
- B. Conduct a specific needs assessment to identify constraints pertaining to procurement, production, marketing and personnel skills, inhibiting better utilization of present capacity.
- C. Explore cost/benefits to the entire country, whereby bakers can receive priority on purchase of raw materials over retail outlets.
- D. Provide technical assistance and training to improve ability to use lower quality flours and make better

use of scarce resources.

E. Explore feasibility of using composite flours. See Part B on Grain Milling for more specific recommendations.

F. Explore making yeast locally either at the bakery level or at a central location where there could be better quality control.

### Bibliography

Semida, John: Study of 50 Small Scale Industries which can Utilize Local Raw Materials in Somalia, USAID, Mogadishu, August 14, 1984, 110 p.

E DAIRIES

Consumption/Marketing

Milk, a major food item of nearly 50% of the Somali nomadic population, also serves as the sole food source for young children and as a widely accepted food for all ages. Per capita consumption is not known because of the spread out nature of production and consumption by small family units and nomads scattered throughout the country. When available, it is normally consumed fresh in homes owning milch cattle and the amount not directly consumed by them is sold fresh in varying quantities to other families, neighbours, etc. It is refrigerated in the large number of tea shops, restaurants and institutions. A small portion, usually excess, is processed into yohgurt, butter, ghee and different types of cheese. The price per litre varies with the seasons, it being ten shillings more during the dry months of April-June and October-November. The prices shown in Table A indicate an increase in the past three years.

Table A  
Milk Prices 1982-84 (Sept.)  
Price (So. Sh.) per litre

<u>Year</u>	<u>Cow</u>	<u>Camel</u>
1982	10.00	9.00
1983	20.00	18.10
1984	20.80	23.09

For Mogadishu and the other urban centers, milk comes from three sources:

- rural people, usually women, who bring the cows/camels milk to urban retailers or directly to consumers. It is sold in varying quantities into containers furnished by the consumers
- small dairies located in urban areas
- imported dry skim/full cream milk.

### Milk Production

Though there is no reliable data on the number or production of milch animals in Somalia, it is estimated to be quite high. It is not as high as it could be probably due to weather conditions which adversely affect both quantity and quality of water/animal feed. This is particularly true during the dry periods of the year when milk is scarce. Milk production increases during the wet months. Transport problems, however, prevent milk supplies from reaching urban centers.

In Mogadishu there are an estimated 35,000 cows of which 50% are milch cows with an average yield of 2-4 liters per day. A yield of 2-5 liters is reported from the municipal dairy with about 800 cows.

Most of the dairies in Mogadishu are small, with about 8-10 cows. These are located in different parts of the city. The cows, raised much like their rural counterparts, are allowed to roam at will, eating whatever is available. This is supplemented with fodder which is both expensive and not easily available. Fodder consists of corn stalks,

grass, wheat bran, sesame seed cake, etc.

Other constraints inhibiting production are shortage of:

- water
- space - resulting in unsatisfactory environment and hygiene
- trained personnel

The presence of the tse-tse fly is another important factor.

#### Imports

To help meet demand, a variety of dairy and dairy substitutes have, in the past, been imported as shown in Table B. page E4.

A retail market survey in September 1984, shown in Table C, page E5, indicates the dairy and dairy substitutes imported to meet market demand.

#### Processing - Past/Present/Future

Till 1969, little was reported on milk production and processing but interest was activated during the 1970's and early 1980's.

Earlier, nomads partly preserved milk which was not consumed fresh. Home level production of cheese was limited till simple techniques were introduced into Somalia by Italians and others. Production of dairy products such as butter and cheese were relatively unknown though yoghurt and ghee were sometimes made for home consumption, not for

Table B  
IMPORT OF DAIRY PRODUCTS  
1981 - 1982

Description of Item	1981		1982	
	Quantity (KG)	Value (So.Sh.)	Quantity (KG)	Value (So.Sh.)
Milk and cream	10,135,623	33,318,681	1,526,480	10,714,416
Milk and cream (including butter- milk, skimmed milk/ whey) evaporated or condensed (including in semisolid form)	627	7,356	N.R.	N.R.
Milk and cream (including butter- milk, skimmed milk and whey) dry, in blocks/powder	10,130,428	33,258,327	595,760	6,513,449
Milk and cream/ fresh (including buttermilk, skimmed milk, sour milk, sour cream & whey)				
Butter, Ghee	245,649	2,693,114	805,224	3,901,120
Butter	29,657	944,834	275,000	1,250,000
Ghee	215,992	1,748,280	530,224	2,651,120
Cheese and curd	5,720	23,614	0,005	00,623

NOTE:

- a) Source: Ministry of Planning
- b) N.R. : Not reported

Table C

Imported Dairy and Dairy Substitutes

September 1984

Item	Quantity (gr)	Prices (So.Sh.)	Origin
Milk Powder	1700	540	France
Milk Powder	1800	500	Holland
Milk Powder	400	130	Holland
Milk Powder	454	150	Holland
Milk Powder	400	150	Denmark
Margarine	500	60	Singapore
Butter	500	70	Kenya

commercial purposes.

There are a few small scale commercial dairy operations where some cheese and, to a lesser extent, butter and yoghurt are produced. These operations are possible only when there is excess milk, such as during the wet months. As stated earlier, milk is scarce during the dry months. Apart from this, other factors which inhibit production of these dairy products include the lack of :

- proper equipment for cream separation
- adequate preservation facilities such as refrigeration.

Cheese: Cheese is produced on a very small scale by private parties in Mogadishu. They prefer cows milk to goats/sheep milk and use imported rennet tablets, which are sometimes difficult to obtain. As per information available, six

different types of hard, semi-hard and soft cheese are marketed. This variation in quality is due to differences in:

- temperature
  - time
  - humidity
  - amount of salt/seasonings used
  - moisture content
- for maturing the cheese

Cheese makers report a good demand for cheese which supplies are unable to meet. Milk made available to them varies from 40 -400 litres/day in Mogadishu and this variation causes fluctuations in the amount of cheese produced.

According to one cheese maker, 100 litres of milk are required to make 20 kg. soft cheese, 6 kg. hard cheese and 9 litres yoghurt. The price of milk determines the price of cheese which varies from So. Sh. 200-300 per kg., depending on the variety of cheese.

Ice Cream: There is excellent demand for ice cream during the warmer months. It is produced mainly by small snack shops using batch type mechanically refrigerated freezers. Lack of good hardening freezers affects formulation and results in the ice cream being of a less smoother consistency. According to one operator, about 20 litres of ice cream are produced from 8 litres of mix.

The main ingredients used in making ice cream in Somalia are: dry full cream, colors and stabilizers. Flavors such as vanilla, strawberry, pitachio, chocolate, menta, rose, hazelnut etc,. are made with the help of imported

materials whilst some flavours are extracted from local foods such as banana, grapefruit, papaya, mango, water melon, coconut, dates and peanuts.

Ice cream is sold in cups or cones. The 3½ oz. U.S. made cups are imported from Saudi Arabia; cones are either imported or made locally from flour, yeast and colouring agent. One producer in Mogadishu makes up to 5000 cones per day at a sale/price of So. Sh. 6 per cone. Thus, according to a Hargeisa ice cream maker, he can sell the same amount of ice cream in a cone for So. Sh. 10 which now he sells in a cup for So. Sh. 20.

Major problems of ice cream makers are related to:

- maintenance of equipment and lack of trained personnel to carry out repairs
- lack of cups/cones/materials to make cones
- high cost of imported raw materials.

Presently capacity utilization varies from 30-50%.

Local sugar, which ice cream makers say is sweeter, is preferred to imported sugar as less is required.

Large Scale Dairies: There are two large dairies, a public one in Mogadishu and a private one in Hargeisa, both scheduled to start operations in the first quarter of 1985.

#### A. Public

The Mogadishu factory had initially started operations in 1966 but lack of local milk supplies, breakdown of equipment etc. led to its closedown and it has

been idle since November, 1983. Currently, the European Investment Bank is financing a project to renovate the factory and increase its operating capacity from 5000 liters per day to 22,000 liters per shift. Till September, 1984, about 70% of the new equipment had been installed. Technical particulars of the factory are given in Appendix A. A full description of the project can be had from the factory manager.

Cow's milk will be provided from six collection centers located near Jowhar, Afgoi, and Qorioley. Dry half cream and full cream milk will be imported. No more than 50% of the production is to be derived from imported sources. The establishment of a dairy farm to supply milk to the factory was considered economically unviable. It is proposed to purchase milk from milch cow owners at the going market rate.

Milk will be distributed in returnable bottles/crates which are being imported. A deposit system will be set up and a loss of 5% per year is anticipated.

Two things, however, will need to be monitored.

These are:

- whether the suppliers of milk to the factory will receive sufficient incentives to sell to the factory
- as a substantial quantity of milk is now being consumed by the immediate family members of milk producing groups, it will be necessary to ensure that income generation does not take priority at the expense of reduced nutritional status.

## B. Private

The Hargeisa dairy plant is expected to start operations between January-March, 1985. A visit to the plant site revealed the following: only about 50% of the walls and roof and 20% of the concrete floor have been constructed whilst none of the equipment (mostly from Afla-Laval), which has arrived and is lying at the building site, has been installed. Thus, starting operations early 1985 seems unprobable.

Plant details can be obtained from the Somali Development Bank in Mogadishu which is financing the project.

Capacity is rated at 38,350 litres (3% fat) of milk using reconstituted imported dry full cream milk on the basis of one shift of 6 hours per day, 20 days per month. Packaging will be in 'Tetra Pak' thus making all material inputs imported except water. There is shortage of this very vital input but there was no indication of any plans to solve the water shortage problem in the Hargeisa plant.

Two other products are planned in this plant. These are:

- reconstituted fruit juice using 18% imported fruit juice concentrate at the rate of 6750 litres in one 6 hour shift per day, 20 days a month
- chocolate confectionery production, to start early 1985.

However, in addition to the hard currency and water problems, the limited buying power of consumers necessitates a good market survey to determine whether buyers/retailers

will accept a packaged reconstituted dry milk product, or the reconstituted fruit juice in view of the resistance from the Mogadishu market when ITOP tried to market canned grapefruit juice (for details see Part H of this report.)

### Recommendations

#### A. Large Dairies :

1. Review the feasibility of the two large planned dairies to start in 1985.
2. For the projects which are feasible, monitor to determine:
  - progress made
  - identify constraints preventing progress
  - ways to overcome constraints and implement same

#### B. Small Dairies :

1. Explore overall costs/benefits of supplying milk, local or imported, to cheese and ice cream makers vs. direct consumption by consumers.
2. Specific needs assessment necessary to determine what can be done to improve production quantity and quality in order to make better use of resources, local materials and reduce imports.
3. Explore ways to make rennet locally for use by commercial cheese makers/nomads to preserve milk nutrients during dry periods.
4. Improve ways to get hard currency required to purchase necessary imported raw materials.

Bibliography

1. B-M-B: Improvement of Milk Supply to Mogadishu, Final Report, EDF Project 4505-015.43.19, Tilburg 1981, p. 66 + Appendix
2. Bernsschot-Moret-Bosboom: Improvement of Milk Supply to Mogadishu - Interim Report, Tilburg, December 1979 p. 84.
3. CITACO SPA: Spenmentazioni Presso L'azinda Dairy Farm 21 Ottobre de Afgoi, Mogadishu November 1972, p. 9.
4. CITACO SPA: Report on Berbera Ice Plant and Preliminary Analysis of the Feasibility of an Ice Cream Factory and Gaseous Drinks Factory, Mogadishu, 1973 p.17.
5. European Investment Bank: Mogadishu Dairy Project, Finance Contract, June 1982.
6. Hummen, W., Gasten, N., Susanne Gura, Hippler, N., Meinarlus, M: The Private Manufacturing Sector of Somalia, German Development Institute, Sept 1984. 163p.
7. Jamhuuriyadda Dimooraadiga ee Soomaaliya Warshadda Caanaha: Warbixin Kooban oo ku Saabsan Wasrshadda, Mogadishu 1976, p. 15.
8. Rodgers, Roland V: Milk Processing Plant, UNIDO Study, Mogadishu, January 1968, p. 20.
9. Shafgat Ali, S: Pre-feasibility Study on the Establishment of Milk Processing Plant at Somalia, UNDP/UNIDO Project DP/SOM/72/007, Mogadishu, July 1976, p. 70.

10. Singh, C.B.: Study for Establishing Banadir Dairy Project, Mogadishu, Ministry of National Planning, SOM/78/008. May 1980, p. 231.
11. Somali Democratic Republic: Supply Plant and Equipment to Mogadishu Milk Factory, Somali Democratic Republic Draft Tender Dossier, Mogadishu March 1981, p. 148.

Contacts

- A. Ahmed Sita - Ownership Partner  
Ayaan Milk and Juice Factory  
P. O. Box 346  
Hargeisa
- B. Mohamed Adan  
ADINO Ice Cream  
P.O.Box 449  
Hargeisa

TECHNICAL DESCRIPTION1. General

The project consists of the rehabilitation and expansion of the Mogadishu Dairy (study, implementation and operation and maintenance). Its daily processing capacity will be brought to at least 22,500 l/day of milk equivalent per shift. The investment will be carried out according to the specifications given below and the attached timetable.

The factory is located in Hodan District, Mogadishu. The plot is 3.8 ha of which 1.84 ha are used for the plant (1 640 m<sup>2</sup>), offices (397 m<sup>2</sup>), stores (644 m<sup>2</sup>), and concrete slabs, roads and ancillary facilities.

2. Specifications of the main plant2.1 New buildings and waste disposal plant

New floors and walls will be installed in all processing rooms and in the laboratory of the existing plant. The future waste water disposal plant will cover about 1 ha.

2.2 New machinery

The plant will comprise of the following units:

	<u>Capacity</u>
- Milk reception	10 000 l/hour
- " reconstitution and precooling	10 000 l/hour
" storage	40 000 l/hour

- Milk pasteurization 5 000 1/hour
- Fermented milk production unit 5 000 1/hour
- Yoghurt production unit 2 000 1/charge  
(5 hrs)
- Cheese production unit 1 000 1/charge
- Bottle cleaning unit 4 000 bottles/hour
  
- Steam production, 2 furnaces,  
pumps 2 000 1/hour
- Cooling unit 70 000-100 000 kcal/  
hour
- Effluent disposal 150 m<sup>3</sup>/day
- Laboratory equipment to make  
daily checks on milk quality  
inputs and outputs
- Complete system of cleaning in place

The existing equipment considered to have a remaining life of more than 3 years and which is compatible with the new equipment, will be maintained.

### 3. Collection centers

Four to six collection centers will be established outside Mogadishu within a 100 km radius. Their throughput will be of 2 000 - 3 000 1/hour, their cooling and collection of milk from out-of-town.

### 4. In-town chilled distribution centers

The centers will have an area of about 16 m<sup>2</sup>, be insulated and have cooling units of about 25 kcal/hour.

### 5. Technical assistance

About 80 man-months of technical assistance will be

provided over 3 years by foreign expatriate personnel. They will be co-responsible with their local counterparts for installing the new equipment, ensuring quality milk supplies, developing new marketing and accounting procedures and laboratory tests.

In addition, local professional staff will receive foreign or local training to help them adapt to the new technology and procedures.

6. Timetable

Tender procedures are scheduled to be completed by June 1982; installation of the machinery by early 1983, and the expatriate technical assistants to have terminated their stay by 1985/86. The new factory will start operating in 1983 and be commissioned before mid 1984.

During installation of the new equipment, the factory will continue to run at least at its current daily capacity of about 5 000 l/day.

\* Source: European Investment Bank: Mogadishu Dairy Project, Finance Contract, June 1982

## F. VINEGAR

### Consumption/Marketing

The demand for vinegar in Somalia is good as it is used by the people for various purposes in salads, cooked rice, and could be used as a flavouring/preserving agent for pickles, ketchups/sauces, as well as a curing and tenderizing agent for meats.

A market survey showed that both imported and local vinegar were being sold in 500 ml bottles for So.Sh.70 and 40 respectively. Local production is, however, sporadic because of the sporadic availability of imported acid and bottles. Thus local producers are unable to give any estimate of their annual production.

### Processing - Past/Present/Future

Vinegar, a sour liquid consisting of dilute (4-6%) acetic acid and other flavourings such as malt, is obtained from food items containing fermentable carbohydrates such as fruit juice, bananas and molasses.

There are no reports or studies on vinegar production in Somalia and interviews revealed that there had been little, if any, commercial production of vinegar using the fermentation method.

At present, vinegar made by blending imported acetic acid, water and flavors is being manufactured by two Somali companies which produce about 1200/750 ml bottles per day, depending on availability of acetic acid and bottles. One

producer uses dates, imported from Saudi Arabia, as the fermentable carbohydrate to produce some acetic acid. Experiments using local molasses for fermentation are being conducted by one processor. However, acetic acid continues to be imported from Italy.

Some of the major problems preventing increased production are:

- lack of hard currency to import acetic acid, bottles and caps
- lack of sufficient technical knowhow to produce acetic acid or vinegar using simple, easy to manage and control procedures. Some basic manufacturing knowledge is present but it is necessary to build on that if an acceptable quality vinegar is to be produced that can effectively compete/replace imported vinegar. Both producers feel that with some technical and financial assistance, they could produce a very acceptable fermented vinegar at prices that could compete with imported vinegar.

In spite of the fact that there is sufficient local demand for vinegar, the scarcity of containers (bottles, etc.) is one of the major hurdles preventing the two companies from expanding their business or making acetic acid in sufficient quantities to replace imported acetic acid.

#### Other Processing Possibilities

The possibility of producing vinegar in Somalia with the fermentation of locally available raw materials should be investigated. Considerable quantities of molasses at

low cost could be obtained from the Jowhar Sugar Mill (SNAI) or other medium size sugar mills now operating in the Lower Shebelle region. (See Part G of this report regarding sugar processing) Non-exportable bananas have also been successfully used in other countries as a source of fermentable carbohydrate and offer possibilities here. Other ingredients such as malt or other flavourings could be imported if needed.

## Recommendations

### Short Term

1. Determine acetic acid needs to meet local demand and reduce importations. Develop and implement plans to expedite the necessary importations of acetic acid.
2. Conduct a market study of used bottles and caps to determine:
  - a) quantity and quality of bottles presently availability given the Somali Government's planned changes on imported alcoholic beverages;
  - b) how bottle and caps are now used by all manufactures (food and non-food) and which uses are most beneficial to the entire country.Possibly other containers could be used or locally made for such items as hydrochloric acid, insecticides, shampoo, germicides, and floor polish which now use glass bottles.

### Long Term

1. Determine feasibility of producing acceptable quality

vinegar in Somalia with simple method fermentation so as to reduce importation of acetic acid.

2. If 1 above is feasible, produce, as a pilot project, using appropriate technical expertise, sufficient quantities of vinegar to verify technical and managerial feasibility and market test for acceptability to replace imported brands. Work with one or both present processors depending on interest and capability.
  
3. Explore feasibility of making plastic containers and/or caps using present facilities of plastic industry in Somalia or making glass containers. (See Part M of this report regarding packaging).

#### Contacts

A. Ali H. Hashim - Vinegar manufacture

OKAY PRODUCTS

P.O. Box 1338

Karaan, Mogadishu

Phone No. 21017/36046

B. Ujeer Ajami - Vinegar manufacture

MAUTONE ROCCO

Via Kamaldin

Mogadishu

Phone No. 21066

G SUGARConsumption/Marketing

The 1984 figures for the per capita consumption of sugar by Somalis is estimated to be about 14 kilos or 74,200 metric tons for a population of 5.3 million. Consumption is expected to increase as more sugar, produced locally to supplement imports, is made available, possibly at lower prices. Contrarily, as local production increases and imports drop, problems besetting the two large scale local factories may prevent self sufficiency from being achieved with the result that both the public and the food processing industry may face shortages, as in the past years. A deficiency of 38,580 tons is expected in 1984 with local production estimated at 35,620 tons and consumption at 74,200 tons.

In Somalia, sugar is mainly used in tea, coffee, milk, fruit juices - natural and synthetic, local confectioneries, sweet pastries and even drinking water containing unacceptable levels of salt.

Locally produced sugar, as a semi refined light tan or "plantation grade", sold in varying amounts for Sh.Sh. 34 per kilo in September, 1984.

Production of Locally Grown Raw Materials

Sugar cane is grown primarily along the Middle and Lower Shebelle and Juba regions with 420,000 metric tons

grown in 1981 and 535,000 in 1982, according to statistics from the Ministry of Agriculture. Production has dropped off in Jowhar in recent years due to such factors as build up of salinity, poor drainage, lack of long term production policies, absence of research programs, lack of fertilizers, pesticides and spare parts.

### Imports

Imports of sugar, sugar type products and honey for 1981/82 are shown in Table A, Page G 3.

Since there have been many studies and reports concerning the feasibility, planning, implementation, progress and changes in the two major sugar mills, SNAI at Jowhar and JSP (Juba Sugar Project) at Gelib and since presently a great deal of attention of the Somali Government and international agencies is directed towards increasing output, it was decided not to survey these in this study. The reader is referred to the studies and reports located in the Ministry of Planning and UNIDO Libraries and more importantly to the contacts listed at the end of the chapter who have both good historical and up to date information on these two mills.

However, a survey was made of the smaller sugar mills and honey produced in Somalia.

#### A. Medium Sized Sugar Mills

In July 1984, a medium size sugar mill near Afgoi began operation with an installed capacity of 45-50 quintals

TABLE A

## IMPORTS OF SUGAR TYPE PRODUCTS + HONEY

1981/82

DESCRIPTION OF ITEM	1981		1982	
	QUANTITY (Kg)	VALUE (So.Sh)	QUANTITY (Kg)	VALUE (So.Sh)
Sugar and sugar preparations	21,516,839	81,305,057	10,052,766	37,501,960
Sugar and Honey	21,250,089	79,900,093	9,905,048	36,624,366
Raw sugar, beet and cane	1,168,697	3,505,824	31,215	32,205
Beet and cane sugar refined	20,046,842	76,222,514	9,844,374	35,817,056
Molasses	580	1,740	2	50
Natural honey	7,414	14,103	1,000	3,000
Other sugar and syrup, n.e.s. (including artificial honey and canned)	26,646	128,914	27,757	222,055
Sugar confectionery and other sugar preparations (except chocolate confectionery)	266,741	1,404,964	73,647	481,216
Sugar confectionery not containing cocoa	98,467	621,150	71,747	474,922
Flavoured or coloured sugar syrups and molasses (not including sweetened fruits juices)	168,274	783,814	900	900

Note: a) Source: Ministry of Planning

b) n.e.s.: Not elsewhere stated

per day. It has new equipment worth about So.Shs. 486,000 and is using expertise from India. Present production is 10 quintals per day of semi refined light tan sugar or khandsari. The mill, owned and operated by the Somali Police Force, employs about 8 persons per shift. All the sugar produced by this mill is consumed by the police force.

Sugar cane, grown not only near the mill on the hundred hectare farm owned by the police but also on other farms, is roller crushed and the resulting juice (60 - 65% of the cane weight) is boiled down in three open pans, over a fire of dry bagasses and wood, to form jaggery. This jaggery is then centrifuged to remove molasses and washed with some locally available/imported chemicals to whiten the sugar. The entire mechanical equipment is powered with one diesel 8 HP engine and a belt/pulley system.

Two mills of similar size, one at Kurtun Weyre and the other at Sablale, are owned by settlement project co-operatives. They hope to begin production shortly and supply sugar to local residents.

With sugar mills operating in their areas, farmers will have an alternative cash crop to plant and irrigation water from the Shebelle will help obtain good yields. The success of the these mills for all concerned is to be seen after production reaches near installed capacity. The new mill viewed at Afgoi is large enough to accommodate other equipment to increase production in the future to over 100 quintals per day.

Molasses, a by-product making up to 50% of the original cane weight, is not now utilized but it is felt that it could be used in making confectioneries, biscuits and animal feed.

The Ministry of Agriculture is providing assistance with equipment, extension, etc. to farmers and it is hoped that farmers and mill owners will reinvest to purchase the necessary inputs and become more self sufficient.

Sugar from these mills is expected to sell for about 1/3 to 1/2 the price from the Jowhar or Gelib mills and be equal in whiteness and overall quality once the mills attain near capacity production. At present a slightly less refined or darker crystallized sugar is accepted by local residents near the mills.

B. Honey Production:

Reliable data on the national production of honey is lacking. The industry is now evolving according to a FAO report (Appendix A) on beekeeping and honey production. There are, according to the report, about 3,000 beekeepers with an estimated 71,000 hives along the sides of the Juba and Shebelle rivers. The annual honey production is estimated at 225,000 liters with an approximate total value of So.Shs. 13 million.

These production figures refer to and reflect the capacity of hollow log hives with annual yields per hive of 3-5 litres.

A Somali businessman in Jannalle has successfully extracted 40-50 litres per hive annually through the adoption of Greek type beehives.

Imports shown in Table A indicate a substantial reduction in imports. Import figures for 1983/84 were not available to check if that trend continues.

The government has initiated an experimental bee-keeping farm at Jannalle and Bonkai villages, in Lower Shebelle and Baidao respectively. Other activities by the Somali Government and FAO are outlined in Appendix A. A FAO consultant surveyed the beekeeping industry and a report is to be issued. Training abroad for 4 Somalis is planned as well as in-country training.

Local honey sells for So.Shs. 300 a kilo and imported for So.Shs. 400. This price difference is partly reflected in the fact that local honey is not as well refined, bottled and labelled as imported honey. The government import tariffs also cause imported honey to be higher priced thus helping to stimulate local production.

Honey is used for medicinal purposes as home remedy and as a sweetner on bread and biscuits. There does not appear to be much use made of bees wax. Uses for this by-product (applicable to Somali needs) should be explored.

Limitations of Honey Production:

- lack of proper technology and training of producers to optimise production, processing and marketing

- deforestation reducing favourable habitats for bees
- spraying methods to eradicate tse-tse fly possibly threatening the survival of bees
- production areas located in remote areas which pose communication problems and accessibility to potential markets.

### Recommendations

#### A. Sugar Resources and Uses

A study should be made of sugar resources and uses in Somalia to determine:

1. Present and projected quantity and quality needs of the food industry using sugar as an ingredient to produce import substitution products and other products not available but for which a local or export market exists.
2. Appropriate ways to make best use of all sugar grades (local and imported) for the economic, nutritional and technical benefit of the country and not just direct consumption by consumers. For example, more benefits or value added may come by diverting more refined grades to the food industry to produce more and better quality products (jams, jellies, bakery goods, etc) utilizing local fruits, skills, labour and existing facilities rather than selling to consumers through retail outlets or to institutions, etc.

## B. Small Medium Scale Sugar Processing

1. Monitor the three newly started medium size mills to:
  - a) Identify progress made, problems encountered and how, if possible, problems were solved
  - b) Provide necessary technical and other assistance to cane farmers and the mills to solve problems and help expand production if feasible
  - c) Determine cost benefits for the mill, its cane farmers and customers and overall benefits to Somalia provided by these mills vs the mills at Jowhar and Jelib
2. If these mills are cost/benefit effective, operating profitably and efficiently, explore the replication of such mills in other locations.
3. Somali Government should provide material inputs, training and credit necessary to help operations become self-sufficient since this is a very necessary outcome if the mills are to be successful.

## C. Honey Production/Processing

1. Determine plans by FAO and Somali Government to provide technical assistance and training to overcome honey production/processing/marketing problems
2. Introduce ways to make better use of honey and by-products (bees wax, etc) for both consumer and, more importantly, for food industry users.

Bibliography

1. Booker Agriculture and Technical Services Ltd:  
Planning and Design Study for the Juba Sugar Project,  
London, June 1976.
2. Booker McConnell Project Ltd: Juba Sugar Project  
Draft Implementation Contract, 1976, Final report  
and accounts 24 months ended 31 Dec. 1978, Monthly  
progress reports, 1978, 79p.
3. Bovell, P and EL-Zeini, H:  
Appraisal of the Project Design of Sugar Agro-  
Industrial Complex, Somalia. UNIDO, 1976.
4. CITACO. SPA: Feasibility Study on the Establishment  
of Sugar Estate in the lower Juba region. UNIDO  
Mission Report 1972, 77p.
5. Hummen, W., Gasten, N., Susanne Gura, Hippler, M.,  
Meinarlus, M.: The Private Manufacturing Sector  
of Somalia German Development Institute, Sept, 1984,  
163p.
6. German Planning and Economic Advisory Group, Dr.  
Hendrikson: Comments on the Suitability of establish-  
ing a Sugar Factory in the Juba Region, Mogadishu 13p.
7. Guruswamy, V: Rehabilitation and Improvement Programme  
for the SNAI Sugar Plant at Jowhar. UNIDO Mission.  
SP/SOM/78/804/11-01. Terminal Report. April 1980,  
33p + Appendix.
8. Guruswamy, V: Assistance to the SNAI Sugar Plant at  
Jowhar. SP/SOM/79/804/ Terminal Report. UNIDO,  
Vienna June 1980, 39p.

9. Guruswamy B: Report to the Somali Democratic Republic Rehabilitation and Improvement Programme for the SNAI Sugar Plant at Jowhar. UNIDO Mission. DP/SOM/72/007 1977, 14.06 p.
10. Semida, John: A study of 50 small scale industries which can utilize local raw materials in Somalia. Report for U.S.AID Mogadishu August 1984.
11. Economist Intelligence Unit: Per Capita Sugar Consumption by Country (1979), The International Sugar Market Special Report No.106. Sept. 1981.

Contacts:

- A. Ajit Singh, Supplier + installer of medium size sugar mill equipment  
Resident Director  
NIKAS Commerical Business Pvt Ltd.  
Nikas Consultant Bureau  
C-32 Greater Kailash-1  
New Delhi, India  
Somalia Address - in office building behind  
Kenya Airlines Ticket Office
- B. Arab Essa Haid, Honey Producer  
P.O. Box 822, Mogadishu  
Office behined Kenya Airlines Ticket Office
- C. Jowhar Sugar Factory:
  1. Omer Hersi Omer - General Manager
  2. Mohamed Sheikh Abdillahi - Director of Production  
Dept.
  3. Abdi Farah Essa, Vice General Manager - Technical Dept.

D. Juba Sugar Project:

1. Dr. Hassan Mohamoud Gibin

Executive Chairman - Juba Sugar Project Mogadishu

2. Mr. H.R.M. Curry

General Manager - Juba Sugar Project Mareri.

APPENDIX A\*

Beekeeping and Honey Production.

Beekeeping and honey production in Somalia is a totally private enterprise. Honey is produced by the hollow log hive system on a village scale using traditional simple methods of beekeeping and honey extraction. This method is rather destructive to the hives and all of the resultant wax is discarded.

Modern beekeeping facilities do not exist. There are about 3,000 beekeepers with an estimated 71,000 hives along the sides of the Juba and Shebelle rivers. The annual honey production is estimated at 225,000 litres with an approximate total value of 13 million Somali shillings.

About 80% of the beekeepers and 90% of the beehives are located in forested areas. The increase in beekeeping activities resulting from economic incentives is being threatened by deforestation for charcoal and farming. The effect of spraying to eradicate the tse-tse fly on the bees is currently under investigation.

About two years ago, in an attempt to increase the income of the rural population and improve crop yields

through improved pollination, the Government requested FAO/TCP assistance in advancing beekeeping management techniques and training of a group of national technical officers in apiculture. Accordingly, a project agreement was signed in 1982 and Mr. Sarborelli was appointed as Apiculture Consultant to Somalia in December, 1982, for a two-month period and he drafted a project for the development of apiculture in Somalia.

However, both the Government of Somalia and Mr. Shawki, FAO Representative, indicated that they would like to see that a follow-up should consist of sending a FAO consultant for one to two months to provide in-country training in beekeeping for the local beekeepers, followed by a long-term project aimed at developing and expanding apiculture in the country.

It should also be noted here that the Environmental Department of the National Tse-Tse and Trypanosomiasis Control Project have also requested the services of one FAO consultant-trainer in beekeeping to provide in-country training. It was requested that the training course be held early enough so that the knowledge gained could be used in assessing the impact of the spraying operation on bees during the aerial spraying operations.

---

\* Note: Taken from a report by H.N. Daoud entitled "Back to Office Report - Syria, Jordan and Somalia Sept. 14 - October 14, 1983, pg.21.

## H FRUIT PROCESSING

Almost all fruit grown in Somalia is consumed at the fresh state. No estimates of per capita consumption is available but for most fruits, supply is able to meet demand except during peak production periods when it is in excess leading to low prices, and low profits for farmers, retailers and traders. However, the consumers benefit for they are able to obtain some important nutritional components at low cost. It has not been determined whether processing of the excess low cost fruits would help extend nutritional advantage over the year when certain fruits are scarce and/or to the persons needing it.

The marketing of many fresh fruits is well documented in a recent USAID survey by Jaffee in 1984.

### Production of Locally Grown Raw Materials

Many of the fruits, as shown in Table A, see page 2, which grow wild or are cultivated in sufficient quantities... can be possibly processed for local consumption/export.

### Imports

Imports of important fruits/fruit preparations and essential oils, shown in Table B, indicate that there is a demand for these. Given the necessary technical, financial and government support, possibly several of these could be produced in Somalia.

TABLE A

## MAJOR FRUITS GROWN IN SOMALIA

NAME	REGION OR DISTRICT GROWN	HARVEST MONTHS
BANANA	Lower Shebelle Lower Juba Bu'le	All year
GRAPEFRUIT	Lower Shebelle Lower Juba Middle Shebelle Hiran Badhaba	June - August Dec. - Jan
DATES	Nugal (Xillin) Berbera (N.W.)	Oct. - Dec
FIGS	Baydhaba (East) Hiran Lower, Middle Shebelle Bussaso	Not known
GRAPE	Baydhaba Hiran	July - August Dec. - Feb
GUAVA	Togdheer N.W. Hiran Middle Shebelle	Sept - Jan
MANGO	Lower Juba Lower Shebelle Hiran	July - August Dec. - Jan
PAPAYA	Lower, Middle Shebelle	All year
LIME	Lower, Middle Shebelle	All Year
SOURSOP	Lower, Middle Shebelle	All Year
ORANGE	NW	Sept. - Dec.
TAMARIND	Lower, Middle Shebelle	All year

TABLE B

## FRUIT, FRUIT PRODUCTS AND ESSENTIAL OILS

## IMPORTS IN 1981/82

DESCRIPTION OF ITEM	1981		1982	
	QUANTITY (KG)	VALUE (SO.SH.)	QUANTITY (KG)	VALUE (SO.SH.)
Fresh or dried fruits and nuts (not including oil nuts)	1,104,239	3,586,855	566,246	2,249,017
Oranges, tangerines or mandarins and clementines, fresh	6,172	54,122	9,500	49,660
Other citrus fruits	471	6,242	445	5,619
Apples fresh	12,000	43,677	240	1,220
Grapes, dreid	297	22,383	NR	NR
Dates, fresh or dried	1,080,186	3,449,025	498,142	2,057,620
Avocados, mangoes and quavas	NR	NR	55,297	102,699
Other fresh fruits	1,913	115,042	2,622	32,199
Fruits, preserved and other preparations	788,645	5,386,216	386,280	2,077,701
Jams, marmalades, fruit jellies, fruit puree and pastes	7,075	74,109	60	720
Orange juice	27,692	142,225	54,956	279,149
Grapefruit juice	50	150	1,352	5,626

TABLE B cont....

DESCRIPTION OF ITEM	1981		1982	
	QUANTITY (KG)	VALUE (SO.SH.)	QUANTITY (KG)	VALUE (SO.SH.)
Juices of any other citrus fruit	864	6,919	NR	NR
Pineapple juice	12,323	74,865	3,620	47,580
Tomato juice	657,438	532,625	117,510	1,293,566
Papaya juice	97	1,200	NR	NR
Juice of any other fruit or vegetable	6,000	35,000	192,502	415,600
Mixture of fruit or vegetable juice	2,914	35,649	NR	NR
Mango juice	14,794	141,087	NR	NR
Fruit temporarily preserved	1,337	12,066	NR	NR
Peel of melons and citrus fruits fresh, frozen, dried or provisionally preserved in brine, sulphur, water, or other preservative solutions	1,241	11,200	NR	NR
Nuts roasted (including roasted ground nuts)	51,970	256,836	280	960
Fruit and nuts, prepared or preserved, n.e.s.	6,089	10,565	NR	NR
Essential oils, essences and other flavour materials	61,165	378,595	9,434	383,200

Note: Source: Ministry of Planning

1. 1982 data is not as complete or as accurate as 1981

2. n.e.s. = not elsewhere stated

3. NR = none reported

Although import data was not available for 1983/84, a market survey in 1984 reviewed the imports of processed fruits, shown in Table C, some of which could be processed locally.

TABLE C  
PROCESSED FRUIT PRODUCTS IN MOGADISHU  
A MARKET SURVEY  
September 1984

ITEM	SIZE (gr or ml)	PRICE SO.SH.	ORIGIN
Pineapple slices	454 gr	60	USA
Fruit jam	454	40	Bulgaria
Tomato juice	800	160	Italy
Tomato juice	150	25	Italy
Fruit juice	125	15	Italy
Jam	320	40	Italy
Fruit peel	580	180	Denmark
Grapefruit juice	330	150	Denmark
Orange nectar	260	30	Japan
Grape juice	330	32	Austria
Pineapple pieces	270	40	Kenya
Orange juice	71	80	Saudi Arabia
Fruit jelly	450	50	Italy
Tomato sauce	420	70	USSR
Tomato sauce	140	24	Greece
Tomato sauce	400	70	Italy
Grapes dried	1000	400	Turkey
Jam (melon)	340	50	China
Fruit drink powder and concentrate (TANG & SUNQUICK)	1000	250	USA and Kenya

Processing - Past/Present/Future

A. ITOP

After some preliminary studies, commercial processing of fruits began in 1972 with the establishment of ITOP (Industrial Transformazione Prodotti Ortofrutticoli) by the Somalia Development Bank. The fruits mainly were mangoes, papaya, tomatoes, and grapefruit. A brief description in Appendix A outlines ITOP's growth and some of its problems up to 1983. Inconsistent supply of raw materials and of cans were two of the major problems reducing both productive efficiency and success. A second-hand can-forming machine was put into operation to utilize the imported flat tin sheets. As it produced poor quality side seams, the scheme was dropped and it was decided to import semifinished cans instead of purchasing a new can forming equipment. Foreign exchange shortages however reduced ability to obtain adequate quantities of semifinished cans. Can cost is estimated at 60% of total canned project cost.

As per information available, a sizeable amount of tin sheet is still in storage, blocking a great deal of foreign exchange. Attempts to export to Kenya have failed.

Obtaining consistent supply of raw materials also caused productive efficiency to vary. Tomatoes were available in large quantities during peak harvest periods thus preventing the processing operations from being stretched out over a longer period. During the early

(Sept/Oct) and latter (March/April) parts of the harvesting season, farmers sold to the fresh market rather than to ITOP because they received higher prices. Because of excess supplies, the fresh market did, however, reject a large percentage of the tomatoes, thus reducing farmer's profits.

To overcome these problems, ITOP, in 1983, offered a higher price of So.Sh. 300 per quintal and bought nearly all quality grades delivered to the factory. The 1984 price is expected to be So.Sh. 450 per quintal and the reject rate about 5%. Assistance is given to farmers to obtain seeds, fertilizers, pesticides, fuel, credit, and shipping containers for raw materials. It is hoped that this will ensure a better supply, spread out over a larger period. In 1983, ownership was transferred to the Union of Somali Cooperative Movement. Member farmers are pledged to supply it tomatoes.

A visit to the factory showed the equipment and facilities to be in reasonably good condition. A second-hand bottle washing and filling line has seen little use because of lack of bottles.

In 1984, ITOP will produce only tomato paste in 400 gm semiformed cans, imported from Italy. The 3 colour printed, possibly very expensive, can indicates that the paste will contain 28% solids thus preventing ITOP from canning a lower % solids product and using the same label/can. Salt at 1% level is the only ingredient added.

An output of 2500 tons of paste over a 5-6 month

period - Oct. 15-April 15- is planned. This assumes a harvest yield of 5 ton per hectare expected by farmers from 500 hectares of land brought under tomato cultivation. A higher yield is expected if weather is favourable. This will be a big increase over 1983 when 142.7 tons of tomato paste, from 800 tons of tomatoes, were produced.

By-products such as tomato skins, seeds, etc. which, in the past, were used by farmers for seed stock and poultry feed, are expected to be in excess in 1984.

In September 1984, a study of the ITOP factory was carried out by a fruit/vegetable processing specialist. Interested readers may obtain his report from the Director at ITOP.

#### B. Other Processors

Flavoured Sugar Syrup: Two businessmen in Mogadishu make a variety of sugar syrup concentrates flavored with lemon, grapefruit, orange, almond, menta, tamarind or pomegranate. With the exception of tamarind and pomegranate, the other syrups use imported flavor essences (essential oils) and colors. They have the capacity to produce 200 to 350/750 ml bottles per day with a work force of 10 -15 persons in each business when necessary inputs are available. Hand operated equipment is used wherever possible to reduce dependence on electric power supplies. Used beer and wine bottles costing So.Sh. 1½ - 2 and 5 - 7 respectively and used caps are utilized when imported ones are not available.

Both businesses can produce more if raw materials such as sugar, flavorings, colors, and containers are available. One company is exploring the use of locally made plastic bottles made at the SNAI BIASA Factory in Jowhar.

Other products produced by one or both of these two companies include reconstituted vinegar, ice cream and rose water. Future plans call for expansion to other products such as jams, jellies, canned fruits, confectionary and dairy cheese products.

Present facilities and equipment seem nearly adequate for present production but if production is expanded or new product lines are introduced, processing equipment, facilities and support capabilities (electric generators, etc.) will be needed. Basic technical assistance, improvements on present products, and development of other products are also needed.

Lime Drying: Drying of whole limes by several farmers in the Lower Shebelle area started in 1980. A good market, found in Saudi Arabia, has served as an outlet for excess limes when fresh lime prices are very low. Producers receive So.Sh.60 per kilo from Somali exporters. One producer said it takes about 45 days to sundry limes depending on the weather. A visit to one operator showed them drying on the ground, causing drying time to be longer than necessary and dried lime quality to be lowered even though only good fresh quality limes are used for drying.

Grapefruit Juice: A market survey showed many snack shops and restaurants sell juice which they squeeze from grapefruit purchased from local fresh fruit and vegetable markets. The non-availability at certain seasons of the year is the major problem. An attempt to solve this problem by ITOP by canning the juice proved unacceptable as consumers preferred fresh juice and would not use canned juice even when fresh juice was not available. Many shops also serve fruit type drink made with orange flavored drink powder (TANG) or orange squash concentrate (SUN-QUICK). Interest was expressed during a survey of shops and restaurants for other juices such as watermelon, mango, guava, etc.

#### Other Processing Possibilities

Based on the availability of a variety of local fruits, the demand for several fruit products and the possible expansion of exports, it seems advantageous to explore the production of some fruit products and ingredients from local fruits.

Table D , p H11, indicates some products which offer potential and for which a market demand is known to exist but not its size.

Many of these products would not only be used by consumers directly but also by bakeries, hotels, Somali Airlines, the military and other institutions. Bakeries, for example, are unable to make several sweet pastries for lack of fruit-containing ingredients. Papaya jam,

TABLE D  
FRUIT PRODUCTS FOR  
POSSIBLE PRODUCTION IN SOMALIA

<u>FRUIT PRODUCTS</u>	<u>SOMALI FRUITS WHICH CAN BE USED</u>
Jams	Banana, Papaya, Guava, Mango, Tomatoes
Jelly	Guava, Papaya, Mango, Grapefruit
Marmalade	Orange, Grapefruit
Canned fruit pieces	Mango, Grapefruit, Papaya, Guava
Canned/bottled juices	Watermelon, Tomatoes, Tamarind, Papaya, Guava, Grapefruit, Mango
Candied fruit peels	Grapefruit, Orange, Lemon
Candied fruits	Papaya, Mango
Dry fruits	Banana, Papaya, Mango, Grapefruit, Grapes, Tomatoes
Pectin (for jellies, ice creams, confectionaries, fruit juices, etc.)	Grapefruit, Tomato skins
Papain (meat tenderizer, etc.)	Papaya
Essential oils (for flavoring sugar syrup, confections, etc.)	Grapefruit, Lemon, Orange
Tomato - Sauce, paste, ketchup	Tomatoes

once produced by ITOP, was well received but lack of containers, and possibly sugar, stopped production.

Sugar, a major ingredient in many fruit products, would have to be made more readily available to processors if such products are to be produced. It is in this instance that the government must look at the value added by diverting suitable grades of sugar to the fruit processing industry thus utilizing excess fruit, reducing imports and creating employment vs. direct sugar consumption in items such as tea/coffee. The newly started medium size sugar mills in the Lower Shebelle offer a possible source of lower cost acceptable sugar. (See part G on Sugar Processing)

Another major problem inhibiting production of many fruit products is lack of containers and now with increased demand the possibility of locally making suitable containers should be explored. (See part N Food Packaging)

To compete in quality with some imported products some preservatives such as sodium benzoate and potassium meta bisulfate are needed to be imported. The cost/benefits would be very favorable.

Dried products from bananas, mango, papaya, citrus and tomatoes offer reasonable substitutes for some imported items. Besides direct consumption, a market exists with bakeries to help broaden their product line. Flour from dried green bananas offers possibilities for extending the amounts of wheat flour and thus reducing wheat and wheat flour imports. (See part B Grain Milling)

In 1983, 75,000 tons of bananas, a major fruit of Somalia, were grown out of which about 62,000 tons were

exported. Those not exported and possibly available for processing were:

- not of export quality
- not a variety that could withstand export shipment
- grown for local consumption and eaten in the green or ripe stage of maturity.

Solar powered equipment for drying fruits could be made using locally available materials and easily taught skills for operation and maintenance. Since the sun's energy, which is estimated to be 1700 to 2200 kilowatt hours per square meter in Somalia, will be free, production costs will come mostly from local raw materials, labour, and some packaging (polyethylene bags presently made in Somalia).

Papain used as a meat tenderizer and beverage clarifier may have an export market. It could also be used in meat products processed for export to upgrade tougher cuts of meat to more tender finished frozen or refrigerated products.

The Afgoi Agriculture Research Institute is now field testing production possibilities of plums, passion fruit, and other tropical fruits which may offer possibilities for processing.

A recent study in 1984 outlines inputs for two agro-industries, a citrus juice plant and a tomato, mango, and papaya juice plant. It is understood the Ministry of Industry is considering conducting feasibility studies on these.

The proposed dairy to start in mid 1985 in Hargeisa is to also produce 6750 liters of fruit juice (18% concentrated) from imported juice concentrate. The Somali Development Bank and/or owners should be contacted for details. See Part E, Dairies, for more description and problems concerning this factory.

Local market for manufacturers of pectin and essential oils needs to be determined. Essential oils could be produced in the idle steam distillation units at SNAI-BIASA in Jowhar, where essences of lemon oil, jasmine, and citronella were once produced for perfumes. Capacity is about 8-10 litres per day per 8 hour shift.

Recommendations:

1. Carry out a specific resource assessment of fruits presently available and new or improved ones planned for future production by the Afgoi Agriculture Research Institute and private businesses.
2. Conduct market research to determine customer (retail, institutional, military, and commercial) needs, specific uses, expected demand, prices, package size and quality, and advantages and disadvantages of local vs imported fruit and fruit derived products.
3. Conduct concept and prototype development and field testing of possible products on a pilot scale utilizing existing commercial and/or academic facilities and expertise with outside technical assistance if needed. At the same time,

determine commercial feasibility and try to incorporate existing food processing operations where possible.

4. Explore export market potential for dry limes and other fruit products to determine feasibility of upgrading existing operations and/or producing semi or fully processed products.
5. Provide technical assistance to help processors use more local materials such as sugar, essential oils, etc.
6. Conduct an analysis to determine if it is cost/benefit effective to provide necessary inputs to fruit processors.

#### Bibliography

1. German Planning and Economic Advisory Group: Dr. Hendrikson, Feasibility Study on the Establishment of a Tomato Processing Plant in Somalia, Mogadiscio, August, 1967, p 51 + 4 appendices.
2. German Planning and Economic Advisory Group Dr. Hendrikson, Feasibility Study on a Tomato Paste Factory in Somalia, Mogadiscio, April 1972, p 77 + 4 annexes.
3. Hummen, W., Gasten, N., Susanne Gura, Hippler, N., Meinarius, M:  
The Private Manufacturing Sector of Somalia  
German Development Institute, Sept. 1984, 163 p.
4. Jaffee, S: Fruit and Vegetable Production and Marketing in Somalia: A survey of the Dheffeso Farmers' Cooperative of Afgoi and an analysis of the domestic and

and export marketing system for fruits and vegetables.  
A USAID survey, Mogadishu, Sept. 20, 1984.

5. Kazmi S.M.A. Ragay: Tamarindus Indica L. A Plant Which Needs Attention. In Somali Range Bulletin by National Range Agency No. 10, November, 1980.
6. Longoz, Derek: Mission Report 6-20 October 1983, Inter-regional Advisor, Energy Resources Branch, Department of Technical Cooperation for Development, UNDP, November 1983.
7. Said Afawi Said: Availability of Raw Materials to Agro-Industries in Conference on Industrial Development and Management, Oct. 4 to 6, 1982 p 77.
8. Semida, John: A Study of 50 Small Scale Industries which can Utilize Local Raw Materials in Somalia, for USAID, Mogadishu, August 14, 1984.
9. Thomas H. Miner and Associates Inc: Feasibility Study for Tomato Paste Manufacturing in the Republic of Somalia, Mogadiscio, May 1968, p 64.
10. Thomas H. Miner and Associates Inc.: Feasibility Study for Tomato Paste Manufacturing in the Republic of Somalia. Prepared for Credite Somalo, Development Loan Section, Chicago, Ill., May, 1968, p104.

Contacts

- A. Ahmed Abu Sita  
Owner/Partner  
AYAAN Milk and Juice Factory  
P.O. Box 346  
Hargeisa
- B. Hassan, Adam  
Manager  
ITOP Factory  
Afgoi
- C. Hashim H. Ali  
Managing Director  
OK PRODUCTS  
P.O. Box 1338  
Mogadishu  
PH: 21017/36046
- D. Salim Abukar Salim  
Afgoi  
(Dried Lime Producer)
- E. Ujeeri Ajami  
MAUTONE ROCCO  
via Kamaldin  
Mogadishu  
PH: 21066

APPENDIX A

Summary Report of ITOP Canning Factory (a)

The ITOP factory was established in 1972 by the Somali Development Bank to promote the economic development of the country. The factory is geographically located near Afgoi which is in a very productive agricultural region. Through Afgoi passes the river Shebelle, and there also exist many roadways for the transfer of finished product to the different parts of the country. A major market is guaranteed as well.

The factory started in 1973 with one universal production line for processing mango, papaya, grapefruit, and tomato juice, with an initial production capacity of 300 quintals of fresh fruits per day in a two shift cycle.

However, in 1975, the addition of a tomato paste processing line increased capacity to 1800 quintals of fresh fruits per day, working in two shifts. Since then, the capacity of the factory remains the same and its entire output is consumed in the domestic market. Therefore, the factory serves purely as an import-substituting industry (foreign exchange saver).

The factory operates on seasonal conditions as it is impossible to process one kind of fresh fruit during the whole year. The seasonal delivery table below gives the production data.

	Harvesting Periods	Distance from farm to factory	Capacity of lines	Products
Tomatoes	1) 16 Sept- 15 Dec.	from $\frac{1}{2}$ km to	1800 Qls.	Tomato paste
	2) Jan-15 Apr.	200 km		Tomato juice
Mango	1) 15 June - July	Always from	300 Qls	Mango juice Mango nectar Mango marmalade
	2) Jan - Feb.	Gelib 400 km		
Grapefruit	Apr - June	from $\frac{1}{2}$ km to  120 Km	300 Qls	Grapefruit juice marmalade
Papaya	May - June	from $\frac{1}{2}$ km to  20 km	300 Qls	Mixture juice syrup/marmalade

When the factory began production in 1973, it employed 26 persons consisting of: 15 unskilled workers, 10 semi-skilled workers and one expatriate.

In 1973, the factory employed 71 persons consisting of: 12 skilled workers, 24 semi-skilled workers, 30 unskilled workers, 5 staff and no expatriates.

Factory area = 190 X 140 meter

Factory building 120 X 80

Finished goods storage 30 X 80

Raw materials storage 7 X 34

Spare parts store 10 X 34

(a) Supplied by former ITOP factory manager

APPENDIX B

## Tamarind (TAMARINDUS INDICA L.)

Tamarinda (Somali names Xamar and Raqay) not only grow wild mostly along the Juba and Shebelle Rivers, but in other regions as well. The tree yields fruit two times a year (Dayr and Haga) which is collected by local persons and sold to traders and marketers from Mogadishu and other urban markets. Some processing is done at the production site by removing the outer dry dark-colored shell and packaging the remaining mixture of pulp, seeds and support membranes into small 1/4 kilo plastic wrap.

Tamarind was previously imported from Thailand and China, but recently locally produced supplies are being used to replace these imports. Though the current price of local tamarind is about twice the imported price, the better flavor of local tamarind is preferred. Since May 1984, the price has risen to So.Sh. 250 per kilo. Previously the price was So.Sh. 25 and 15 for local and imported tamarind, respectively. The current price increase is partly explained by decreased importation of tamarind.

Primary use of tamarind in Somalia is the preparation of sauces to be eaten with maize, porridge and occasionally with rice and pasta. One softdrink manufacturer, Alba, uses some to make tamarind-flavored bottled drinks.

A review of the presence of tamarind in Somalia and a description of its fruit, wood and uses has been printed by the Somalia National Range Agency.

I BEVERAGESConsumption/Marketing

The major bottled beverages consumed in Somalia are mostly carbonated with a few uncarbonated flavored drinks and mineral waters making up the rest. Per capita consumption is not known but is believed to be high, second only to tea, due to

- a. Warm climate necessitating increased liquid intakes
- b. Shortage of water and in some cases potable water
- c. Exposure and effort to imitate Western beverage habits
- d. High demand for sweet foods
- e. Lower cost than and basic Moslem laws/beliefs against alcoholic beverages

Management at the Mogadishu Coca Cola plant estimates present production of 220 cases (24 bottles per case) per hour only satisfies 1/3 of the market demand for Mogadishu and immediate area.

Locally made beverages are marketed some through wholesalers but mostly through retailers who pay a bottle/case deposit. Some delivery to retailers is done but retailers also come to bottlers to help improve ability to obtain adequate supplies to meet demand which is very rarely met.

Average retail price for 1/3 liter carbonated, 1/3 liter mineral water and 1/4 liter carbonated beverages

is So.Sh. 7,2.91 and 4.16 respectively not including a bottle deposit of So.Sh. 10 to 20.

No beer is produced in Somalia but a feasibility study was done in 1980. Ethyl alcohol is produced at the SNAI-Jowhar sugar mill from molasses and mixed with flavors and colors to produce rum, gin and other high alcohol liquids at the SNAI-BIASA factory. Demand is reported to be very high but supply is limited due to low productivity of the sugar mill. This sector of the food industry has not been explored. Further details can be obtained from the SNAI-BIASA management in Jowhar.

### Imports

Some imported mineral water in 1 and 1½ liter plastic bottles helps to meet demand but no flavored carbonated beverages are imported as shown in Table A.

TABLE A  
IMPORTS OF NON ALCOHOLIC BEVERAGES  
1981 - 1982

Description of Item	1981		1982	
	QUANTITY (KG)	VALUE (SO.SH.)	QUANTITY (KG)	VALUE (SO.SH.)
Non-alcoholic beverages, n.e.s.	449,876	22,521,901	201,361	1,535,485
Waters (including spa waters and aerated waters) ice and snow	46,360	64,050	85,031	220,280
Lemonade and flavoured spa waters and other non-alcoholic beverages	403,516	22,457,851	125,330	1,315,205

Note: a) Source: Ministry of Planning

b) n.e.s.: Not elsewhere stated

Processing - Past/Present/Future

Production of bottled beverages summarized in Table B shows all are operating considerably under capacity, in only one to two shifts.

TABLE B  
NON-ALCOHOLIC BEVERAGE PRODUCTION

IN SOMALIA

Location	Product	Capacity		First Production Date (year)	No. of employees
		Installed (cases/hr) (24 bottles per case)	% Used (Estimate)		
Mogadishu	Coke Fanta Sprite Soda water	430	40-60	1968	175
	ALBA Mandarin Ginger Apple Tamarind	100	60-75	ND	30
	Pepsi Team Marinda	400	20-30	1982	75
	SAGAL Mango juice	10-12	40-50	1984	10-15
Hargeisa	Pepsi Team Marinda	150-175	30-50	1977	70
	Coke	750	NK	Proposed for late 1985	NK

Note: ND = Not Determined  
NK = Not known

Some problems preventing more use of local materials and greater utilization of capacity common to all presently operating plants include, but are not limited to, the following.

1. Lack of hard currency and difficulty in getting letters of credit
2. Quality and quantity of local sugar and water not adequate although all have equipment to filter and improve slightly below quality standard sugar and water
3. Fuel and electric costs, availability and dependability - All have electric power generators
4. Use of imported bottles and caps which must be to quality standard set by parent company. ALBA uses some used beer bottles but also has imported bottles and caps
5. Increasing labor cost accentuated by under utilization of capacity and resultant lower productivity of labor force.
6. Lack of good technical knowhow for operating, maintaining and repairing equipment

Some additional facts about each plant follow.

Mogadishu Coke Plant - Because of difficulty in obtaining raw materials of the preferred quality the parent company has relaxed quality control standards to allow production to proceed. They import from Pakistan about 15,000 cases of bottles per year; caps are from Italy. Wooden cases, locally made, costing So.Sh. 120 each are used which they feel are cheaper than plastic

because wood cases can be repaired. It has its own well but power cuts and surges burn out pump motors; so it has to depend on city water supply. It owns its own carbon dioxide (Co<sub>2</sub>) gas plant and sells excess to others. Since the equipment is getting worn out, production capacity is even less compared to raw material shortages.

Mogadishu Pepsi Plant - This plant uses locally produced sugar when available but prefers refined imported sugar. It imports about 55,000 cases of bottles every 2 years to replace those broken and/or lost and to meet increased demand. In 1983, caps imported from Italy cost So.Sh. 36 per 1000. Management feels this plant meets about 40% of demand during the hot months. U.S.AID's CIP has assisted in getting cleaning chemicals but not spare parts, bottles, syrups or caps.

The CO<sub>2</sub> plant attached to this factory is in a broken down condition mostly because of lack of spare parts and of technical knowhow on operation and maintenance. This factory and possibly others have hired expatriate technicians from Paksitan and India who come on lower salaries than those from Europe or the U.S. Technically trained Somali personnel are not qualified enough to handle the quality of work required.

Though only a little over 2 years old, the general condition of the building and equipment is very poor. Since few spare parts were ordered with the new equipment many production stoppages occur.

SAGAL Plant: Though mango juice is a fruit product it is included in this section since it is a beverage as well. Used soft drinks and beer bottles are purchased for So.Sh. 2 and washed. They are filled with a very simply prepared and pasteurized juice, capped and repasteurized. No preservatives are used as none are available in Somalia. Because of limitations of equipment and storage, spoilage and fermentation problems often occur before the juice can be bottled. SAGAL purchases caps from a local importer for So.Sh. 3,500 per 10,000 but would like to purchase direct.

Other raw materials used are sugar, locally purchased when sugar is available, and water. Washing bottles are a problem because of time involved but sufficient quantities of water are available.

Supply of mangoes is made more constant because SAGAL has a contract with growers to supply directly to it. There are only about 1½ months per year when mangoes aren't harvested. The plant would like to have the capability to store fresh mangoes or juice in bulk to enable it to extend production all through the year.

Sales are made to retailers at So.Sh. 176 per case plus So.Sh. 48 for bottle/case deposits. Retailers sell for So.Sh. 10-12 per bottle. Management feels demand for at least 500 cases per day exists in Mogadishu. When new equipment, already available, is installed production capacity is to expand to 200 cases per day. Demand is lowest in April, May, and June the cold months.

U.S.AID's CIP has not been approached for aid as the management wants to get more established before submitting a proposal. Other fruit juices planned for include guava, papaya and soursop.

Hargeisa Pepsi Plant - The last time a letter of credit was obtained for syrup and sugar was in 1981. Water availability is very much a problem but there are no immediate plans for solving it. According to management this water problem has been caused in part by the influx of refugees into the Hargeisa area. Co<sub>2</sub> was imported from Djoubuti; the Mogadishu Pepsi plant now supplies it when possible. Bottle breakage is about 1000/month and returns are very near 100%. Management feels they can just meet demand of about 2,600 cases/day during the four cool months of the year and much less of the demand during the remaining warmer months.

Hargeisa Coca Cola Plant (proposed to start production in the latter half of 1985). Like its competitor - the Hargeisa Pepsi plant - this plant may also have problems getting sufficient water in spite of plans to improve the Hargeisa water plant and the plans of the Coke plant to have a three day water storage facility. A Co<sub>2</sub> plant is also planned.

In 1984, a proposal was sent to the U.S.AID's CIP office for all equipment except the bottling equipment. A visit to the plant site showed that only 10-30% of the construction had been completed.

The plant capacity seems rather large in relation

to the demand from consumers of the 8 northern regions of Somalia. Some of these are very sparsely populated and also difficult to reach by road.

Mogadishu ALBA Plant - It imports most of the flavor and color concentrates from Italy, but the tamarind flavor is made from local tamarinds when available. CO<sub>2</sub> is now imported, but there are plans to install a CO<sub>2</sub> plant along with proposed plans to expand capacity to 300-350 cases/hour. A proposal has been prepared by a German company which is looking for a joint venture to help finance it, particularly in relation to the equipment. The U.S.AID's CIP program has received this proposal; but according to management, CIP could not offer assistance although it assists a Pepsi plant in Sudan.

Bottles are imported from Italy. The plant has submitted 3 letters of credit for raw materials. Water supply has been declining thus reducing output. The equipment is becoming worn out, and the management would like to get assistance in locating U.S. suppliers for technical assistance, equipment and raw materials.

Mineral Water - There are two other Somali manufacturers of mineral water, but particulars on their operations could not be found. These are believed to be small operations located in Mogadishu and using used beer and soda bottles. One Mogadishu businessman has equipment for making demineralized water of different grades, but has been idle for over one year for lack of containers. He also wants to start a mineral water operation but bottles are also a problem.

### Recommendations

- A. Carry out a cost/benefit analysis to decide what imported inputs, if made available through easier access to hard currency, will bring most benefits to the country.
- B. Explore local production of bottles and caps. See Part M on Food Packaging in this report for more details.
- C. Explore ways to make and repair cases using low-cost simple techniques.
- D. Study feasibility and plans for Hargeisa Coca-Cola plant. If feasible, provide inputs and assistance where needed.
- E. Review ALBA - Mineral Water and Soft Drink Factory proposal with the view of providing the necessary hard currency and assistance to enable it to use more local material to make such items as fruit juices.
- F. Provide technical assistance and training to the SAGAL plant to upgrade skills, reduce production problems and develop the market-test new products.

### Bibliography

1. Anonymous: Seven-Up - Hapi Orange Project in Mogadishu, Somalia Feasibility Study, 1981, 18 p.
2. BRAUHASSE Brewery Project - Somalia  
No. 356, October 1980, 75 p.
3. CITACO SPA: Feasibility Study Report on the construction of a plant in Hargeisa for the production of fizzy drinks. Mogadishu, January 1973, 25 p.

4. CITACO SPA: Report on Berbera ice plant and preliminary analysis of the feasibility of an ice cream factory and gaseous drinks factory, Mogadishu, 1973, 17 p
5. Coutuiho Food Engineers - Plant for Soft Drinks - ALBA Mineral Water and Soft Drink Plant Aug 1984
6. Hummen, W., Gasten, N., Susanne Gura, Hippler, M., Meinardus, M: The Private Manufacturing Sector of Somalia, German Development Institute, Sept. 1984  
163 p.

#### Contacts

- A. Ibrahim Hussein Maalim  
ALBA (Mineral Water and Soft Drink Factory)  
P.O. Box 437  
Mogadishu  
Phone: 21580
- B. Omer Mohamed Mohamed - Mango juice manufacturer  
ICS - SAGAL JUICE  
P.O. Box 728  
Yaqshid District  
Mogadishu  
Phone: 22764
- C. S.A. Olad - Planned mineral water producer  
Operations Manager  
TEAM LTD  
P.O. Box 479  
Mogadishu  
Phone: 80428
- D. Seraaji Ali Hagi Hassan  
Director of Finance  
COCA COLA - Mogadishu

## J CONFECTIONERY

### Consumption/Marketing

Somalis are great consumers of sweet foods. Per capita consumption of sugar is estimated to be 10 to 20 kilos annually. Confectionery consumption has not been determined but a considerable amount is sold in open markets, tea shops and other retail outlets. Some imported confectioneries go through the market chain-importers to wholesalers to retailers and finally customers. The price per kilo at wholesale level is about So. Sh. 180 but at retailer level it is So.Sh.360.

Local confectioneries sold mostly in open markets (by women and children) and in tea shops are priced at So. Sh. 80-100 per kilo or So. Sh. 1-2 per piece.

### Production of Locally Available Raw Materials

Many of the major ingredients which are used in making different types of confectioneries, shown in Table A are now made or could be made locally.

### Imports

To help meet part of the demand for confectionery, imports worth So. Sh. 1,404,964 and 481,215 for 1981/82 respectively, were obtained.

### Processing - Past/Present/Future

Few studies were found relating to confectionery manufacture in Somalia. A 1983 feasibility study for a Mogadishu confectionery factory gave a relatively up to date picture of the confectionery industry prevailing at that time but did not look

TABLE A  
CONFECTIONERY INGREDIENTS

Ingredient	Locally		Possibly need to import
	Present	Could be Made	
Sugar - Brown	✓		
Refined		✓	✓
Molasses	✓		
Glucose syrup		✓	✓
Cocoa			✓
Cocoa butter			✓
Fat - butter	✓		
ghee	✓		
Gelatine		✓	
Salt	✓		
Nuts - groundnuts	✓		
Coconuts	✓		
sea almond (Terminalia catappa)	✓		
Citric Acid		✓	
Fruit - dried		✓	
pulp		✓	
Honey	✓		
Starch		✓	
Flour	✓	✓	
Flavors - Natural	✓	✓	
Artificial			✓
Essential		✓	✓
Oils			
Colors - Natural	✓	✓	
Artificial			✓
Agar		✓	
Packaging-Polyethylene	✓		

at what was being produced at home level or by commercial operations and the kind of problems they faced.

Home level confectioneries are usually simply made of crystalline sugar formulas with food color and some coconut or fruit added. An Arabian sweet, hawlo, resembling fruit cheese made of sugar, oil and guava or other pectin containing fruits is sold for So. Sh. 80 to 100 per kilo.

The only known confectionery factory in Somalia started in 1974 producing hard candies. New packaging equipment installed in 1980 brought capacity to 10 metric tons/day with employment of 40 persons; 10 skilled. The product after being individually wrapped, was packed in 5 kilo bags, 10 bags/carton, and sold to wholesalers who sold to retailers in 5 kilo bags. No locally produced wholesale or retail prices were available. Due to lack of raw materials (imported glucose, cellophane wrapping paper, flavor essences, citric acid and color) and spare parts, actual production has been about 1.5 tons/day or about 10 - 15% of capacity. The factory has been shut down for most of 1983/84 but plans call for restarting later in 1984.

Some local sugar can be and has been used and the quota allocated (500 quintals per month) is adequate for production levels thus far. Lack of dependable electric power also reduces production levels so a generator purchase is planned.

The owner estimates about 80% of the demand would be met at the 10 ton/day capacity. He feels he could produce hard candies

of quality comparable to imports and at lower prices. Even though the Government has greatly reduced imports through legal channels, a great deal is imported illegally.

USAID's CIP has been approached for assistance to purchase raw materials and equipment. No third world countries, approved for CIP purchases, produce the necessary inputs to the owner's knowledge. The alternative with CIP is through the U.S. purchases which are very expensive.

With present equipment and facilities hard toffee and some soft candies can be made. Future plans also call for increasing the number of hard candy flavors and for producing chewing gum.

Besides the previously mentioned feasibility study for a Mogadishu confectionery factory, interest has been expressed by others for more information on the subject.

At least two small Mogadishu private business firms presently producing vinegar and sugar syrups have plans to start confectionery manufacture. Both are waiting until hard currency and local raw materials such as sugar are more liberally available. Some basic skills are available but no mechanized confectionery equipment was seen. Also, the exact type of products to be made have not been determined.

A proposed dairy to start operation in Hargeisa about mid 1985 also plans to make chocolate confectionery. Details of this plant and some problems which need to be looked into are briefly discussed in Part F Dairies of this report. The

Somalia Development Bank, principal funding source for this project, can give further details.

### Recommendations

- A. Conduct a market survey to determine percent of diet made up of confectionery products, present and expected prices, preferences, etc. and the anticipated market demand.
- B. Study recent feasibility studies to ascertain if they are still feasible given the present economic and resource climate.
- C. For those feasible projects
  1. Monitor progress made.
  2. Identify constraints inhibiting objectives from being met.
  3. Provide inputs if necessary to help overcome/reduce constraints.
- D. Improve ability to get hard currency if cost/benefits should be advantageous for entire country.
- E. Develop and market test concepts and prototypes.
- F. Provide technical assistance and training to improve the ability of present operations to make better use of scarce resources and to develop new/improved products/processes.
- G. Special attention should be given for manufacturing and marketing more nutritious products such as those containing more fruits, nuts, and less highly refined sugar and other imports.

- H. If raw material supplies permit and foreign exchange cost/benefits are favorable explore export market.

Bibliography

1. Associated Consulting Engineers (ACE) LRD: Feasibility Report on the Manufacture of Confectionery at Kismayo, Karachi, November 1983.
2. Muktar, Ali Mohamed: Feasibility Study for Establishment of Caramel, Toffee, and Chocolate Confectionery Factory in Somali Democratic Republic for Somali Ministry of Industries, 1983, p. 48.
3. Somali Republic Ministry of Industry and Commerce: Investment Opportunities in Candy and Confectionery Factories and Stores, Mogadishu, 1962, p. 14.

Contacts

- A. Mr. Jirde Hussein - Confectionery Manufacturer  
General Manager - Import/Export  
P.O. Box 552  
Mogadishu  
Phone 20868

## K FRESH WATER FISH

### Consumption/Marketing

Consumption of fresh water fish from the Juba and Shebelle rivers and the sparsely scattered small lakes or haro, is limited mostly to the lower income groups living in/near these areas. Here the fish, caught with hook and line, traps or basic nets, is sold and eaten fresh. The price ranges between So. Sh. 10-20 per kilo, depending on availability. Demand is modest as the people do not find fresh water fish culturally acceptable. Reasons for this may be:

- lack of know-how about preparing fish.
- desiring stronger flavoured flesh type food.
- previous experience of unpleasant odour from partly spoiled fish.

### Fresh Fish Resources

The Juba and Shebelle rivers, which are muddy and somewhat brackish at certain times of the year, offer good potential for a fresh fish harvest. Estimates show a possible harvest of 8000-20,000 metric tons per year. Though there are no estimates of the number of fresh water fishermen or the type of fish catch, fresh water fishing as a means of income/subsistence is done on both rivers, as per information from the Ministry of Fisheries. There are, however, a greater number of fishermen in the Lower Juba areas than elsewhere along the two rivers.

### Processing - Past/Present/Future

A. Luug Project: In an effort to explore this fish resource, World Concern, an international organization, initiated a project near Luug in Halba I Refugee Camp, in September 1982,

to determine:

- the acceptability of fish as food by Somalis and refugees.
- the interest of local fishermen to learn/use different and, hopefully, better fish catching techniques.
- ways to process the fish to a more acceptable form.

It was found after preliminary testing of various processing methods that fish rubbed with salt, pepper and garlic and then smoked, was acceptable to nearly 50% of the people who, trying it once, were willing to buy it again. Whilst fresh fish sold for So. Sh. 12 per kilo, smoked fish sold for So.Sh. 15-20 per kilo and fried fish from So. Sh. 20-30, the latter two products showing a more popular pattern.

Nearly all fishermen surveyed indicated interest to learn/use different fishing methods. After a preliminary survey of the types of fish in the Juba river/Luug area, a training programme was conducted by Rich Bracy, a fisheries expert, for about 50 fishermen on how:

- to build, repair and use fish traps
- to smoke fish
- develop a fish trap as an alternative to the hooks and line methods commonly used

The traps were sold to the fishermen and a payback system set up to recover costs. Catches of 20-40 kg. per night were obtained, smoked by a World Concern employee in their compound in Halba I and sold to refugees and Luug area residents.

The Ministry of Fisheries showed interest in the expansion

of the project to other areas and though a proposal and a concept paper were submitted by World Concern, no action was taken due to lack of funds. Other agencies interested in the project at that time, included Food for the Hungry, Africare, Mennonite Central Committee and Action Aid.

The project was terminated after operating for a little over one year for various reasons, some of which are:

- World Concern had neither the funds nor staff expertise to continue.
- when the interest of fishermen dwindled with the funds, World Concern terminated the project.
- according to fishermen, the hooptrap developed was heavy and difficult to handle.
- lack of proper tools and methods to build/repair hooptraps.
- according to refugees, time and effort in smoking fish was too great.
- the smoke house built by World Concern in their compound was too far from refugee camp residents doing the smoking operations.
- some fishermen feel that salt washed into the river at Far Cusbo and Cusob Afdeer during the rainy season kill the fish.
- fishermen have not traditionally fished when the water level of the rivers has been very high or low indicating a catch variation depending on the height of the river.
- crocodiles sometimes damage the traps.

A recent survey in 1984 conducted for World Concern aimed

at getting up to date information on reasons why local fishermen have not continued fresh water fishing. World Concern is still interested in helping where possible but are unable to provide technical and/or financial aid.

Little commercial processing such as salting, smoking and drying appears to have been done in the past as an income generating activity.

B. Private Venture: In May 1984, a Somali businessman began catching catfish, tilapia and carp from a reservoir near Balad. By September, about 4 tons/week were being marketed - 2 tons to the Modern Fish Market in Mogadishu and the remainder to Kismayo for freezing and possibly local consumption. Larger catfish of 4 kg. or more are preferred to the smaller tilapia or carp for marketing because they fetch a higher price of about So. Sh. 13 per kilo whilst the latter fetch about So. Sh. 10. Fish being processed at the Modern Fish Market are sold for So. Sh. 20 per kilo. This compares favorably to the price of the kingfish and yellow tuna at So. Sh. 27.50 and was aimed at developing a market. When marketing operations began in May, employees at the Modern Fish Market did not want to process or even touch the fish. Also, consumers were reluctant to purchase because they felt that the fish would emit bad odours which would be transferred to people touching or eating them.

It was discovered that icing down the fish shortly after catching and removing the head and entrails prevented odours from developing. Having solved the odour problem, fish market

employees and consumers accepted the lower priced fish and sales increased. Consumers also discovered that the fat in the fish flesh helped in cooking and reduced the need for cooking oil. In this way, an urban market for fresh water fish has been established which was earlier limited to the lower income consumers living near the rivers.

Competition naturally exists from sea fish but price differences are helping to overcome this. Fresh fish market competition does not pose a problem to the Somali businessman for even though people in the Balad and Jowhar areas have started fishing, they lack the refrigerated transport with insulated boxes for carrying the iced down fish which he has. They have, however, started drying the fish flesh in strips which is more easily transported for sale to Mogadishu, Balad, Jowhar, etc. Strips of fresh catfish weighing about one kilo sells for So. Sh. 10 whilst a strip of dried catfish which was originally the same weight as the fresh strips and takes out 3-4 days of drying in the sun, sells for So. Sh. 6.

Future plans by Somali businessman include:

- expanding fishing operation to 5 or 6 other locations along the Lower Shebelle and Lower Juba river areas.
- starting a fish drying, salting and possible smoking operation as well as drying the offal to prepare fish meal at a Lower Juba location.

Both the manager at the Modern Fish Market and the businessman, estimate that 400 to 500 metric tons can be harvested per per year from the two rivers.

To help expand the operation technical and financial assistance is being sought dealing with shallow warm water fish gear and improved refrigeration, smoking, drying and fish meal processing methods and equipment.

Assistance has already been provided by the Ministry of Fisheries through two Somali fish biology technicians to improve the overall operation and monitor the type and quantity of fish caught.

C. Public Fish Market Processor:

The Modern Fish Market in Mogadishu has, in addition to walk-in freezers and plate freezing facilities, further processed fish product equipment including skinners, mixers, and stuffers for handling 500 to 1000 kilograms per day depending on the product. This latter equipment has not been much used, is idle at present and no immediate plans exist for using it.

Recommendations:

1. Conduct a study, using a fresh water capture fisheries expert familiar with African river fish ecology and capture techniques, to identify:
  - a) Type, quantity and size of fish and other river water dwellers which could be a resource for human or animal consumption
  - b) Source and influence, if any, that salt has on aquatic populations and harvest
  - c) Influence different river heights have on ability to

harvest

- d) Harmful diseases, parasites, etc. which could be transmitted from river harvests to humans or animals
- e) Low cost, easy to build, maintain and use methods to harvest or ways to improve present methods
- f) Monitoring methods to prevent over exploiting river resources and causing ecological imbalances

If the above study indicates that further investment is desirable and feasible, then continue with the following:

- 2. Employ a fish product technologist experienced in small to medium scale fresh water fish and fish by-product processing and marketing to:
  - a) Identify appropriate methods to handle, transport, refrigerate, smoke, dry, salt and otherwise produce acceptable products for local consumption and export if a local market does not exist
  - b) Conduct a study of small scale fishermen in Luug area or elsewhere to determine if sufficient market and financial rewards to fishermen are possible to make a more organized fishing venture feasible
  - c) Develop a plan to provide the necessary technical and financial assistance based on needs assessments of interested fishermen.

Bibliography:

- 1. Bracy, Rich: Catch Fishery - Proposal, 1983
- 2. Bracy, Rich: Quarterly Report Fisheries, World Concern, Mogadishu, September 1, 1982 - January 15, 1983

3. Bracy, Rich: Quarterly Report Fisheries, World Concern, Mogadishu, January-April 1983
4. Bracy, Rich: Ministry of Fisheries Projects - Coordination Meeting, World Concern Project, March 21, 1983
5. Maxon, Dan: Concept Paper, September 13, 1983
6. Semida, John: A Study of 50 Small Scale Industries Which Can Utilize Local Raw Materials in Somalia, Report for USAID, Mogadishu, August 1984
7. Welcome, R. L: Some General and Theoretical Considerations on the Fish Yield of Africa Rivers, Journal Fish Biology, Vol. 8, pp. 351 - 364, 1978

Contacts

- A. Ali Farah, Director of Research, Ministry of Fisheries, Mogadishu
- B. Arab Essa Haid            Fresh Water Fisherman  
P. O. Box 822, Mogadishu  
Office behind Kenya Airlines Ticket Office
- C. Dan Maxon: World Concern, Mogadishu, Phone 80184.
- D. Mr. Kawaguchi, FAO Strengthening of the Ministry of Fisheries Project,  
Director, Ministry of Fisheries, Mogadishu
- E. Yusuf Abdullahi Nur  
Manager  
Modern Fish Market, Mogadishu

L FRESH FOOD PRESERVATION AND STORAGEIntroduction

One of the many problems confronting the Somali food industry is shortage of local raw materials. The greater part of locally grown items like raw cereals, legumes, fresh fruits, vegetables and root crops, are purchased by retailers. Heavy to partially heavy losses are incurred during handling, storage and marketing with the result that the demand for these items far exceeds actual requirements thus reducing supply, in terms of quantity, for processing/preserving.

Cereal and Legumes: The more important cereals and legumes grown in Somalia are aimed at meeting the staple food requirements of the local people. Table A shows the production of some of the major cereals and legumes.

TABLE A

PRODUCTION OF MAJOR CEREALS & LEGUMES  
IN SOMALIA

CROP	PRODUCTION (Metric Ton 000)		
	1981	1982	1983
Maize	142	150	235
Sorghum	222	235	240
Rice	29	20	28
Legumes (cow-peas) and green grams	10	15	20.5

Source: Ministry of Agriculture

The pattern of cereal consumption is changing with increasing reliance on imported rice and wheat. Consumption at present stands at sorghum 28%, maize 27%, rice 14% and wheat/flour 31%. This import dependence is a strain on the economy and efforts must be initiated to make better use of locally grown cereals and legumes. According to the Head of the Somali National University, Plant Production Department, losses during storage and handling exceed 20% for legumes whilst no reliable estimates are available for cereals but are, nevertheless, believed to be high. Several reports by FAO have given estimates of losses ranging from 5% to over 30%. A 1975 FAO report giving types or causes for losses and problems encountered with traditional farm storage methods indicates improvements are necessary.

There are a number of reports and feasibility studies on grain storage status, improvements and marketing, a report describing the present farm storage techniques commonly used and another offers attempt to improve these techniques. The 2-year FAO Grain Storage and Pest Control Project in cooperation with ADC (Agricultural Development Corporation) is aimed at upgrading grain storage facilities and practices through training and technical assistance. Other organizations from the Netherlands and Australia plus World Food Program are also presently involved in grain loss reduction programs. USAID is planning a storage improvement project for cereal grains and legumes.

ADC presently has about 200,000 tons of grain storage

at warehouses, silos, underground and other types of flat storage. Only about 40% is being utilized because of lack of grain.

Root crops: Sweet potato, cassava and white potato are the main root crops grown in Somalia but reliable production values seem to be lacking.

Somalis are becoming more familiar with sweet potatoes and this demand has encouraged increase production. Approximately 10,000 hectares planted, mostly in the Middle and Lower Shebelle regions, in 1984, expect a yield of 20-30 tons/hectare during the Gu and Dayr seasons. Damage and subsequent spoilage caused by weavils, the primary pest, is not known.

Cassava was once exported to Italy but with the termination of imports by Italy, production of cassava has dropped drastically. It is now grown on a limited scale around Balad mainly to feed animals. The national pasta factory tried, unsuccessfully, to incorporate cassava flour with wheat flour for making pasta but there was resistance from consumers who felt that the addition of cassava, considered a poor man's food, lowered pasta quality. (See Part B Grain Milling for some possible human food uses of cassava). Since this is not used as a human food, little attention has been paid to storage and spoilage problems.

Potatoes are grown in the northern areas of Somalia particularly around Erigavo. Persons knowledgeable about the production, storage and handling problems were not available

during the Hargeisa visit. It is felt by the Plant Production and Plant Protection Department of the Somali National University that storage and handling problems do exist which contribute to the high cost of potatoes many times during the year. Data on the extent of these problems was not found even if it exists.

Fruits and Vegetables: Consumption of fruits and vegetables has increased considerably as a result of increased production. According to statistics from the Ministry of Agriculture, production increased from 35,000 tons in 1981 to 102,000 in 1982. The reasons for this increase are outlined in a 1984 USAID report by Jaffe, who made an analysis of the domestic and export marketing systems for fruits and vegetables in Somalia.

There is no reliable data available about the amount, type and causes of post harvest losses for any fruit or vegetables. Losses which occur take place at many points along the market chain from producer to consumer. According to Jaffe, at least 20% losses and damage to papaya, mangoes and tomatoes occur from:

- delays in these perishable items being picked up by transporters.
- poor transport and road conditions. Losses in quality may be even greater since transport, handling and market practices, (because of lack of knowledge and limited resources) can do little to prevent physical damage and/or dehydration resulting in weight losses and subsequent increase/decrease in price/seller's profits.

According to Jaffee, the following loss estimates for 1984 were made at the retail market level:

	% Loss
Sweet Pepper	5
Tomatoes	10
Lettuce	5
Carrots	5
Bananas	5 or more
Grapefruit	5 or less

These estimates appear low since:

- retailers may be rejecting some of the produce purchased from wholesalers/other traders, before it actually reaches the market.
- wholesalers/other traders may be discarding produce damaged/spoiled before purchase by retailers.

An in-depth analysis of how, when and where these losses occur, is needed.

There are very few storage facilities for fruits and vegetables in the country and no refrigerated transport or cold storage was found. One Somali businessman is planning a cold storage for fruits and vegetables but the size and date of starting operations was not known. A description of the storage facilities of produce sold in Mogadishu is dealt by Jaffee in his report.

#### Recommendations

- A. Cereal Grains - Monitor progress made by joint FAO/ADC

Grain Storage and Pest Control Project and provide inputs and assistance where needed.

- B. Legumes, Root crops, Fruits and Vegetables
1. Conduct an up to date assessment to identify:
    - a. where, when, and how losses of different types occur and the amount of each.
    - b. present specific practices, planned activities and progress made to reduce losses.
  2. Develop, adapt and field test ways to reduce losses.
  3. Provide training on storage, handling, transport, and marketing.

#### Bibliography

1. Forest, R: Somalia Informal Technical Report on Grain Storage. UN/SF/FAO Project on Grain Marketing, Storage and Price Stabilization. LA/UNDP/SF/SOM/7, LA/SF 68/52 FAO Mission, 1968 p. 16.
2. FAO: Grain Marketing, Storage and Price Stabilization. Somalia - Problems of Grain Storage AGDP/SOM 166/507 Technical Report No. 2, Rome, 1974, p. 49.
3. FAO: Grain Marketing, Storage and Pricing Stabilization Project UNDP/FAO/SF/SOM/7. Report of the First Phase of the Project and General Plan of Work. FAO Mission, 1978, p. 80.
4. FAO: World Food Security Country Report: A Policy and Action Plan for Strengthening National Food Security in Somalia, May 1978 ESC/FSAS/SOM.
5. FAO: Bankers Programme Investment Center. Working

Paper on Tentative Project/Possibilities in Somalia:  
A Basis for Discussion with the Somalia Development Bank,  
May 1979 FAO 22 pages.

6. FAO: Action programme for Improved Plant Protection AGP:  
IPP/81/1 Report of the Survey on Plant Protection 27 Nov.-  
7 Dec. 1980.
7. FAO: Assessment of the Food Agriculture and Livestock  
Situation, OSRO Report No. 01/84/E Rome, January 1984.
8. German Planning and Economic Advisory Group Dr. Hendrik-  
son: Feasibility Study on Renovation and Enlargement of  
Grain Storage Facilities in Somalia, Mogadishu, May 1966,  
p. 57 + Appendix.
9. Hayward, L.W: Grain Marketing, Storage and Price Stabiliz-  
ation Project - Problems of Grain Storage. FAO Mission,  
1970.
10. Jaffee, Steven: Fruit and Vegetable Production and  
Marketing in Somalia: A Survey of the Dhefisso Farmers  
Cooperative of Afgoi. An Analysis of the Domestic  
and Export Marketing System for Fruits and Vegetables.  
For USAID, Mogadishu, September 10, 1984.
11. Morely, C.R: Informal Technical Report on Grain Marketing  
and Storage, Somalia, and Central Grain Storage. AGS/SOM/  
507, FAO Mission, 1973, p. 14.
12. Mohamed, Abukar Moallin: Current Techniques and Uses  
in Conservation of Food Retained for Family Consumption  
in Somalia. A Study of Traditional Food Processing  
and Storage Practices in two Pilot Villages in the  
District of Afgoi, Lower Shebelle Region FH/SOM/022

October 1982.

13. Mohamed, Abukar Moallim: Improving Food Processing and Storage - A Quantitative and Qualitative Description of the Implementation of Project FH/SOM/022 - Developing Rural Family Resources May 1983.
14. RICCI C: Report of the Government of Somalia on Grain Silos. EAP/FAO TA Report No. 1905 FAO, Roma 1964, p. 27.
15. Shawki, M.K: FAO and Agriculture Development in Somalia, March 1984.
16. Watt, M.J: Somali - Grain Storage and Crop Production UNDP/FAO/SF Project SOM/7 Technical Report No. 1, 1977, 1477, p. 49.

#### Contacts

A. Abukar Moallim Mohamed

Department Head of Plant Production and Plant Protection  
Faculty of Agriculture  
National University of Somalia, Mogadishu

B. Dr. Ahmed A. Mokhtarzadeh

Plant Breeder - Cereal Grains & Legumes  
Ministry of Agriculture - Research  
Institute, Afgoi

C. A. H. Qureshi

Project Manager  
FAO Grain Storage and Pest Control Project  
Agricultural Development Corporation

E. Olad, S.A. - Plans Refrigerated Food Storage

Operations Manager

P. O. Box 478

Mogadishu

Phone 80428/80557

## M FOOD PACKAGING

Raw food materials and packaging are two very important inputs necessary for the successful operation of food processing businesses. Availability of raw materials and other problems connected with it have been discussed earlier in this report. Having access to reasonably priced, technically and market acceptable packaging material of different types - plastic, metal, paper, glass, and caps, is another major problem faced by most of the Somali food enterprises thereby preventing better utilization of capacity.

The actual usage of packaging materials in Somalia is difficult to determine because:

- it depends on the availability of raw food and other materials which is sporadic
- of lack of spare parts for packaging and food processing equipment
- no clear data was found indicating the specific type of finished or semi-finished packaging materials which were/are imported for use.

### Production - Past/Present/Future

Few studies were found relating to the production of packaging materials. A feasibility study in 1977 for setting up a glass making factory reached the conclusion that it would not be feasible because there was lack of sufficient demand for glass bottles and other glass items to make it a viable scheme. On the other hand, demand for flexible and semi-rigid plastic containers and cardboard cartons was sufficient

to warrant the establishment of factories for their manufacture in the 1970's and early 1980's.

A. Plastic

In 1972, INCAS, a joint venture between an Italian company and the Somali Government, started in Jamame, the production of polyethylene bags and cardboard cartons for the banana export industry. Since then, it has expanded and, based on specific orders received, it manufactures polyethylene bags of various sizes (widths up to 2 meters) and film thickness for retailers (shopping bags) and industrial users. In spite of expansion to meet growing demand, it continues to use only polyethylene resin pellets. The extruding capacity was not known by persons interviewed but is believed to be the largest in the country.

A private enterprise, Haplas, at present manufacturing plastic (polyvinyl chloride) window frames and folding doors in Mogadishu, is scheduled to begin, within the next 6 to 7 months, production of polyethylene shopping bags to compete against INCAS. Unlike the Incas bags, these will be unprinted but future plans include installation of printing facilities. Polyethylene pellets will be imported from the U.S. and Taiwan and technical assistance is being sought through USAID's Commodity Import Program.

A third plastic bag factory in Mogadihsu is planned but particulars were not available at the time of writing this report. The Ministry of Industry's Private Sector Department can assist with further information about this private venture

as plans develop over next 4-6 months.

There is one factory in Mogadishu which produces injection molded plastic drinking cups, plates, funnels, water pitchers and strainers. Particulars were not available as the factory is not operating at present and the private owner could not be located. It was learned, however, that it had been operating under installed capacity but reasons (raw materials, markets etc.) were not known.

At the SNAI BIASA compound in Jowhar, there is a government owned and operated factory producing plastic bottles. In the near future it plans to manufacture jerry can type containers of various sizes (3 to 20 litre capacity). It has an Italian blow molding machine, about 3 years old, with a capacity of 8000 bottles per 24 hours and also a 3 year old Italian injection molding unit, with a capacity of 48,000 bottle caps per 24 hours. A second, older used blow-molding machine is now being set up to produce jerry cans. It also has a third blow-molding machine with which an attempt was made to produce transparent PVC bottles. Erratic electric supply prevented this from developing into a commercially viable addition to their product line.

Polyethylene pellets are at present being used to produce bottles of two qualities - softer and pliable/harder and more rigid in 20, 100, 250, 500 and 1000 milliliter sizes. These are purchased by other industries as well as SNAI BIASA, for products such as shampoo, edible oil, distilled water and medical alcohol. Apart from edible oil, no known uses

are made by the food industry although ALBA, a soft drink bottler, is considering these bottles as a substitute to the used beer and soft drink bottles or the glass bottles imported in the past.

The estimated price of a bottle including the cap is So. Shs. 3-5 for 250ml. size and So. Shs. 8-10 for the 100ml. one.

Primary production problems relate to lack of hard currency for the purchase of polyethylene pellets and other plastic such as PVC, polystyrene etc. which can be used on the existing machines. Equipment and skills to make plastic shoes, boots and beach slippers also exist but lack of raw materials prevent operations.

The factory is running at 20-40% capacity. Apart from problems listed above, technical problems and locating additional markets seem to reduce better utilization of capacity.

#### B. Glass

There may be in 1984 sufficient demand to justify the setting up of a glass factory. A 1983 feasibility study as an extension of the 1977 study showed local glass manufacture to be feasible. A private firm is now making plans to locate equipment for start up in 1986.

Additional markets for glass bottles exist if standards can be maintained for the following which are operating today or are scheduled to start within the next 12 months.

<u>INDUSTRIES</u>	<u>OPERATING NOW</u>	<u>PROPOSED</u>
Beverages	4	1
Dairies	-	2
Fruit Processing	1	2
Mineral Water	1	1
Vinegar	2	-
Alcohol-Medical & Commercial	1	-
Non Food Containers	5	-

The construction/building trade has increased considerably thus opening up a vast market for window glass as well as other household items.

In the present situation, definite efforts have to be made for better utilization of the limited glass bottle supplies. For example, a brief market survey showed that a large number of used soft drink/beer/wine bottles are being used for locally bottled items such as acids, insecticides, germicides, shampoo and floor polish. Plastic bottles could be made for some if not all of these non food items and thus make available more of the easier to clean and seal glass bottles for the food industry.

#### C. Metal Cans

The ITOP fruit canning plant in Afgoi was the only one in Somalia capable of manufacturing cans (for details see Part H : Fruit). The machine, capable of making side seams on cans, did not operate well and as a result, the factory now imports semi-formed cans. Since materials costs amount to

nearly 85% of the total can cost and 60% of the canned product cost, it was decided not to import a new can forming machine. ITOP has a sizeable amount of flat tin sheets lying unused and attempts to export these to Kenya have failed.

One of ITOP's major problems in the past was obtaining sufficient cans and this problem may continue for the 1984/85 season if hard currency is not made available.

D. Cardboard

Cardboard cartons produced by INCAS from imported roll stock are also cut, formed and sold to industrial customers, but the banana export trade tops its priority list. Some industrial customers feel the prices of the cardboard cartons to be too high. The price factor may be influenced by the fact that at present INCAS is the only producer of cardboard cartons in Somalia.

Unlike nearly all the business enterprises interviewed, there were no recurring problems either adversely affecting or preventing production by the factory which now employs about 200 Somalis.

Recommendations

- A. Conduct a specific needs assessment of packaging users from the food/non-food industries to identify type, size, other specifications and quantity of packaging required to better utilize present production capacity and allow for implementation of planned increases in production.
- B. Survey existing Somalia packaging manufacturers for

specific identification of their capability to meet industry requirements and constraints preventing production needs from being met.

- C. Conduct a cost/benefit analysis to determine the type of packaging required for those food items that are most feasible to provide hard currency for importation of packaging materials, spare parts and replacement of packaging equipment.
- D. Explore new possibilities:
  - 1. Conduct feasibility studies for establishing new factories and/or expanding present factories to manufacture such packaging materials that are not being made now or are too costly or of poor quality. Specifically look at cardboard cartons, rigid/semi-rigid plastic containers, metal cans and bottle/jar caps.
  - 2. Identify ways to utilize banana fibre and other indigenous materials to make packaging materials and glues for packaging.
  - 3. Explore use of large volume, returnable, reusable containers for large use customers such as institutions, the military, airlines, etc.
- E. Used glass bottles and caps:
  - 1. Conduct a survey to identify the number, types, uses, marketing system and problems existing with used glass bottles and caps.
  - 2. Carry out a cost/benefit analysis to determine the types of uses of these two items which will bring

maximum benefits to the country.

3. Plan and implement a program to receive the benefits and facilitate the obtaining of alternate packaging materials for users no longer having priority on used glass bottles.

### Bibliography

1. Bernschott, Moret, Bosson, Crown Cork Manufacturing Unit: Feasibility Study, 1980
2. Hummen, W., Gasten, N., Susame Gura, Hippler, M., Meinarlus, M.: The Private Manufacturing Sector of Somalia; German Development Institute, September 1984, p. 163
3. INTRA - Uforal Plastics Factory - A Project Identification Report, October 1983, p. 26
4. Semida, John: A Study of 50 Small Scale Industries Which Can Utilize Local Raw Materials in Somalia, For USAID Mogadishu, August 1984

### Contacts

- A. Abdulqadir Arif - Polyethylene Bags Manufacturer  
General Manager, Haplas  
Via Balad Road, Mogadishu
- B. Mohamed Abukar - Polyethylene and Cardboard Box Manufacturer  
Chairman, Board of Directors  
Somali Fruit/INCAS, Mogadishu
- C. Sheekay Sadiq Haji Abati - Plastic Bottle Manufacturer  
Head of Production Sector  
SNAI - BIASA Factory, Jowhar

N FOOD INDUSTRY SUPPORT SERVICES

Apart from helping the food industry increase production through improved government policies and procedures, there is the need for technical and training support which could be furnished by an organized institution either at the government or non-government level.

Justification

1. At present there is no centrally located, adequately staffed, funded and equipped facility which the food industry can use as a source for trained personnel, technical training and advice. The Faculty of Industrial Chemistry, affiliated to the Somali National University, has limited facilities, two full time Somali food technologists and, when time and funds permit, some visiting Italian food technologists who come to assist in various teaching and research activities. The school and staff have limited ability to serve the food industry since scarce resources such as funds, staff time and facilities are allocated to teaching. A short report giving the history, functions and needs of the Department of Food Science and Technology within the Faculty of Industrial Chemistry is given in Appendix A. Besides training undergraduate students, the department is presently involved in research with camel milk and papaya. There is no research directed specifically to any particular food processing operation.
2. According to discussions with two food Somali technologists,

there are at present 5 food technologists in Somalia: two at the University, one at the ITOP fruit cannery at Afgoi, one at the Kismayo fish canning factory and a fifth person, presently unemployed, specialized in dairy products. Due to the small number, there is little they can do for the growing diversifying food industry. Also, many of the food processing operations are too small to justify or afford a full time food technologist even if one is available and adequately trained.

3. There are very few reference books and publications pertaining to the food technology and the food industry. Most of those available are to be found in the libraries of the University, FAO and UNIDO.
4. According to the Ministry of Planning statistics, imports of food during 1981/82, were 153,633,233 and 168,868,346 kilograms valued at So. Sh. 583,528,220 and So. Sh. 581,074,178 respectively. A substantial amount of these imports consisted of processed/unprocessed food which could have been processed within the country itself if capabilities had existed thereby allowing the food industry to contribute towards import substitution and saving hard currency.
5. Much effort is presently being put into increasing the ability of the agricultural sector. Statistics for fruit and vegetable production in Somalia for 1981/82 were 35,000 and 102,000 metric tons respectively. These figures are expected to increase as technical assistance and the necessary inputs are increasingly made available to farmers.

With increase in food production, the demand for fresh food will come closer to being met. It is essential that immediate plans be made to allow the food industry to develop capabilities to utilize excess food during peak harvest seasons when the farmers are compelled to sell at low prices. This capability will also allow more processed/semi-processed food to be exported thus earning foreign exchange. Food industry support services can assist considerably in improving these capabilities once they have been initiated.

SIDAM (Somali Institute for Development of Administration and Management) is considering a project by the California State Univeristy to provide inputs, yet unspecified to the Somali National University. The needs of the Department of Food Science and Technology have been discussed with SIDAM (see Appendix A) and it is possible that the proposed project may address some of those needs.

In surveying a number of private sector businesses, a common request was for more technical information and training and sources of equipment and other supplies. In addition, many international development agencies operating in Somalia have need for technical advise particularly relevant to Somalia which will aid in development of income generating projects dealing with food processing/preservation.

#### Recommendations

With the initiatives put forth by the Faculty of Industrial Chemistry it seems further efforts should be made

to identify how the Food Science and Technology Department (FS & T) and possibly other Somali agencies could be improved or established. These would assist the food industry directly with technical assistance and training and indirectly through qualified graduates.

I. Direct Food Industry Assistance

- A. Conduct a needs assessment of the FS & T and other possible agencies based on technical and training needs of different food industry sectors.
- B. Provide inputs to FS & T and other possible agencies. These inputs could include, but not be limited to, the following:
  - 1. Laboratory and pilot plant equipment and facilities.
  - 2. Reference books, periodicals, etc.
  - 3. Specific technical assistance and training to industry staff in Somalia or abroad if necessary.
  - 4. Lists of food industry suppliers and assistance in other countries.
  - 5. Assist with raw material procurement methods; product/process development, improvement, adaptation and expansion; marketing; problem solving, and management.
- C. Develop a direct food industry support assistance program which would be financially self-supporting. Some funds could come from fees charged to industry for services rendered.

- D. Establish liaison with FAO, UNIDO and other locally available information sources.
- E. Assist in organizing and managing a Somali branch of the Institute of Food Technologists which is a world wide organization aimed at bringing the food industry processors, food industry suppliers, government agencies interested in the food industry and academic food technologists together for information exchange, training and student placement.

## II. Indirect Food Industry Assistance

- A. Do needs assessment of food science and technology department based on technically trained personnel needs of different food industry sectors discussed earlier in this report and new food industries not now present in Somalia but are planned for, e.g. food fermentations.
- B. Develop curriculum which provide basic and applied food science and technology skills to meet industry needs.
- C. Upgrade teaching staff skills and facilities through exposure to visiting professors or study abroad.
- D. Develop university level training program which provides a sufficient number of trained graduates to meet industry needs. It will be necessary to match number and type of training received to that needed by industry. Develop an incentive program that will attract and keep qualified graduates in

Somali food industry positions.

E. Develop a program for on-the-job training of students.

This could be partly, if not completely, financed by industry and industry suppliers.

III. Set up a Somali Bureau of Standards with accompanying quality control techniques and training and monitoring capabilities to act primarily as a support agency to the food industry and as a policy forming body.

IV. Upgrade skills and facilities of a workshop providing assistance to build, adapt and repair sanitary, functional food equipment and tools.

#### Contacts

A. Abdullahi Mohamed Hussein

Department of Food Science and Food Technologist

Faculty of Industrial Chemistry

Somali National University

Mogadishu

B. Hassan Ali Elmi

Food Technologist

ITOP Fruit Processing Plant

Afgoi

C. Mostafa K. Elhag

SIDAM - World Bank Project Director

P. O. Box 964

Mogadishu

Phone 21945

APPENDIX A\*

SOMALI NATIONAL UNIVERSITY

FACULTY OF INDUSTRIAL CHEMISTRY

DEPARTMENT OF FOOD SCIENCE AND TECHNOLOGY

Prospective Report

The Faculty of Industrial Chemistry, having recognized the need of scholars who have professional competence in food science and technology and who can deal properly with problems of the greatest concern in our country: hunger and malnutrition, decided in 1980 to create within the Faculty of Chemistry a new department of food science and technology whose functions would be:

- a. Supervising, teaching and guidance of that discipline
- b. Preparing BSc. students in food science and technology
- c. Providing technical assistance of specific problems for existing food industries
- d. Assisting food related ministries in the development of food laws and standards
- e. Developing a research of traditional technology in terms of advantage and disadvantage and ways of developing it into an industrial scale
- f. Investigation and analysis of imported food

In the meantime the department has developed undergraduate curriculum in food science and technology that can serve as the base for the preparation of BSc. degree. The curriculum consists of three years of basic science and

chemistry and two last years of technological application. At the present time the laboratory of the department is equipped to carry out chemical analysis which can help in the characterization of the most common food stuffs and their eventual adulteration.

Since the new department and the new curriculum in food science is supposed to get fully implemented in 1987, the department needs these facilities:

- a. Teaching laboratory will have up-to-date and adequate fixtures and equipments to conduct the chemical, engineering and microbiological exercises
- b. Pilot plant facilities to teach principals of unit operations and processes
- c. Information concerning food science and technology and related disciplines: Publications, scientific and industry journals, text books, reference materials and government documents
- d. Training opportunities for the department members
- e. Since the department is very young, visiting professors should be available so they can contribute their experience in coordinating didactic and research activity in the department.

\* Note: This report was submitted by Abdullahi Mohamed Hussein, Food Technologist at Faculty of Industrial Chemistry, Somali, National University, Mogadishu, 1984.