35. GROUNDNUT BUTTER

TABLE OF CONTENTS

I. SUMMARY

This profile envisages the establishment of a plant for the production of Groundnut Butter with a capacity of 25 tonnes per annum.

The present demand for the proposed product is estimated at 12.6 tonnes per annum. The demand is expected to reach at 25.26 tonnes by the year 2010.

The plant will create employment opportunities for 13 persons.

The total investment requirement is estimated at Birr 1.31 million, out of which Birr 0.96 million is required for plant and machinery.

The project is financially viable with an internal rate of return (IRR) of 14% and a net present value (NPV) of Birr 0.45 million, discounted at 8.5 %.

II. PRODUCT DESCRIPTION AND APPLICATION

Groundnut butter is yellowish, brown butter like product made from groundnuts. It is made essentially from cleaned, graded, blanched, roasted and crushed groundnuts containing about 45% oil and over 25% proteins.

Groundnut butter is used in the production of sandwiches, candy, bakery products, etc.

The major raw materials are groundnut, salt, sugar, emulsifier, preservatives and autoxidants. The region has huge potential for the supply of groundnut.

III. MARKET STUDY AND PLANT CAPACITY

A. MARKET STUDY

1. Past Supply and Present Demand

Groundnuts are a good source of protein and have high-energy value. In developing countries, groundnut is very important to meet the growing demand for protein and oil in daily diet. Groundnut is used in diversified ways. Groundnut butter as one of the diversified products used as spread for bread or biscuits, in cookies, sandwiches, candies and frostings or icings. Recently, it is also used as a substitute for milk in the preparation of *"maciyato"* in fasting days at cafes in Addis Ababa. It is fair source of calcium, iron and vitamins. Commercial manufacture and consumption of groundnut butter is said to be largely an American art. About half of edible oil groundnuts are used for groundnut butter.

The Ethiopian market for groundnut butter is at the introductory stage. According to the External Trade Statistics, 843,490 kg butter have been imported from abroad in the last six years with an average annual import of 140,582 kg. However, a closer look at the data set in Table 3.1 indicates that butter imported in 1999 alone was 818,316 kg. Excluding this exceptionally exaggerated figure, the remaining five years exhibit butter import ranging between four and eight thousand kg, the average for the five years being 5,031 kg.

As to the suppliers, Yemen, Djibouti and Italy are the first three countries contributing 87 %, 8 % and 2 % of the total imported butter in the past six years, respectively. Details are depicted in Table 3.2. After excluding the 1999 import as an exception, in the remaining five years Italy is the major butter supplier covering 57 % of the total import, Belgium and Yemen covering 14 % and 5 % of the import taking the second and third rank, respectively.

Imported butter landed cost varies as high as Birr 269 per kg (Cayman Island) to Birr 4.00 per kg (Yemen, Djibouti and Somalia). The Italian butter average landed cost of the past six years was Birr 12 per kg. The landed cost analysis and opinions of retailers suggest that about 80 % of butter import is groundnut butter. Thus, the current estimated average imported groundnut is 4,018 kg.

Although official statistics on the domestic production of groundnut butter are not available, there are branded and brand less groundnut butter products packaged in a jar of approximately 500 gm at supermarkets in Addis Ababa. According to retailers in the field, the local supply of groundnut butter is at least twice the imported one. Thus, an estimated 8,036 kg of the groundnut butter is assumed to be produced domestically. The current (2004) effective demand for groundnut butter is estimated at 12,554 kg.

Table 3.1
IMPORTED SUPPLY OF BUTTER (KG)

Year	Import	Value	Landed Cost Birr
1999	818,376	3,474,600	4
2000	4,392	73,813	17
2001	4,402	50,869	12
2002	7,030	84,521	12
2003	1,792	25,583	14
2004	7,498	135,749	18
Total	**843,490**	**3,845,135**	**77**
Average	**140,582**	**640,856**	**13**
Average Excluding 1999	**5,031**	**74,107**	**15**

Table 3.2

IMPORTED BUTTER SUPPLY BY COUNTRY OF ORIGIN (1999 - 2004)

Sr. No.	COUNTRY	KG	VALUE	LANDED COST (BIRR)	%
1.	Yemen	730,078	3,051,728	4	87%
2.	Djibouti	69,905	247,187	4	8%
3.	Italy	15,870	196,665	12	2%
4.	Singapore	6,864	97,499	14	1%
5.	South Africa	5,348	54,770	10	1%
6.	Australia	5,092	31,141	6	1%
7.	Belgium	3,821	89,794	24	0%
8.	Somalia	3,480	14,950	4	0%
9.	Greece	1,001	12,174	12	0%
10.	United States Minor Outlying I	487	5,429	11	0%
11.	Netherlands	469	14,017	30	0%
12.	United States	315	3,382	11	0%
13.	United Arab Emirates	291	9,792	34	0%
14.	United Germany	200	2,324	12	0%
15.	Israel	127	1,946	15	0%
16.	Saudi Arabia	40	2,083	52	0%
17.	Kenya	40	1,381	35	0%
18.	Cayman Islands	29	7,790	269	0%
19.	Great Britain	20	700	35	0%
20.	France	13	385	30	0%
GRAND TOTAL		**843,490**	**3,845,137**	**5**	
Six years average		**140,582**	**640,856**	**5**	

2. Projected Demand

The demand for groundnut butter is related with urbanization. In addition to the relative shelf-life, labour price and high nutritional content advantage of the product, the fact that urban families are becoming familiar with the product will have a positive impact to attract more consumers and hence the demand for groundnut will increase. Therefore, by considering the various factors the demand for groundnut butter is projected by employing an average annual growth rate of 6%. The projected demand for groundnut butter is presented in Table 3.3.

Table 3.3
PROJECTED DEMAND FOR GROUNDNUT BUTTER (KG)

Year	Project Demand
2005	13,307
2006	14,106
2007	14,952
2008	15,849
2009	16,800
2010	17,808
2011	18,876
2012	20,009
2013	21,210
2014	22,482
2015	23,830
2016	25,260

3. Pricing and Distribution

The price of groundnut butter produced by Tsehay Candid Food & Peanut Butter is Birr 8/per 500gm. Another similar brandless domestic producer is selling at Birr 6 for an approximate 500 gm butter. Imported groundnut butter of American origin has a retail price of Birr 18 per 318 gm. The recommended factory-get price for the product under study is Birr 7.56 per 500gm. The by-product, oil cake, will be sold Birr 100 per quintal.

Distribution is one of the major success factors of the new product. The project being in Benshangul-Gumuz Region, the product has to be distributed to major urban centers, with special emphasis to Addis Ababa, the single most important market of the product. The product is, therefore, to be distributed to supermarkets and other food related retail shops. Rising public awareness of this relatively new product through promotion and advertisement is also important.

B. PLANT CAPACITY AND PRODUCTION PROGRAMME

1. Plant Capacity

Based on the market study shown above, the demand for groundnut butter (or oil) by the year 2006 will be about 14 tonnes, and this figure is expected to grow to about 18 tonnes by the 2010. Considering an economics of scale production of groundnut butter (oil), the envisaged plant will have annual production capacity of 25 tonnes of groundnut butter and 175 quintals of oil cake. The plant will operate single shift, 8 hours a day, and for 300 days a year.

2. Production Programme

Production of edible oil from oil seeds other than groundnut is widely known in the country, and then is a well established skill. However, the establishment of market outlets might take time until the product gets public acceptance. It would, therefore, be advisable to commence production at low level of plant capacity, and gradually increase production until it is reached to full capacity. Therefore, the plant will start operation at 60% of its rated capacity in the 1st year, and then increase to 70%, 80% and 90% in the 2nd & 3rd year and reach at 100% in the 5th year and thenafter. The production build-up programme is shown in Table 3.4 below

Table 3.4
PRODUCTION PROGRAMME

Year	1	2	3	4	5-10
Capacity utilization [%]	60	70	80	90	100
Production (tonnes) - Butter	15.0	17.5	20.0	22.5	25.0
Oil cake (Quintals)	105.0	122.5	140.0	157.5	175.0

IV. MATERIALS AND INPUTS

A. RAW AND AUXILIARY MATERIALS

The major raw material required for the production of groundnut butter is groundnut seed. The oil content of groundnut seed varies from (50-55)% while the average composition of shelled nuts consist of 30.4% protein, 40.7% fat, 11.7% carbohydrate, 2.5% ash and 5.4% water. Resource Potential Assessment (2004,IPS) indicates that the seed grows around Metekel area.

Other raw materials required for the plant are salt, sugar, emulsifier, preservatives, etc., and packing materials. Here, it is assumed that the rate of oil extraction will be 50%.

Annual requirement of raw and auxiliary materials at full production capacity is shown in Table 4.1 below.

Table 4.1
RAW AND AUXILIARY MATERIALS REQUIREMENT AND ESTIMATED COST

Sr. No.	Description	Unit of Measure	Qty. (kg)	Cost, ['000 Birr]		
				LC	FC	Total
1.	Groundnut seed	Qty.	500	125.00	-	125.00
2.	Salt	kg	175	0.26	-	0.26
3.	Sugar	kg	300	1.5	-	1.50
4.	Emulsifier	kg	100	0.3	1.9	2.20
5.	Preservatives	kg	10	0.2	0.5	0.70
6.	Anti-oxidants	kg	2	0.3	0.3	0.60
7.	Other additives	kg	1	0.2	1.2	1.4
8.	Plastic bottles	No.	25,000	20	-	20.0
	Grand Total			**147.76**	**3.9**	**151.66**

B. UTILITIES

Utilities required by the plant are electricity, water and fuel oil. Electricity is required as a source of energy for machinery and equipment, for lighting and power sockets. Water is used for human consumption and as feed water for boiler. Fuel oil is required to produce steam from water. The annual requirement of utilities at full production capacity of the plant is shown in Table 4.2 below.

Table 4.2
UTILITIES REQUIREMENT AND COST

Sr. No.	Description	Qty	Cost, ['000 Birr]
1	Electricity (kWh)	15000	7.5
2	Water (m^3)	1250	3.0
3	Fuel oil (litres)	5000	14.0
	Total		**24.5**

V. TECHNOLOGY AND ENGINEERING

A. TECHNOLOGY

1. Production Process

The technology of manufacturing groundnut butter involves simple application of expellers. Groundnut Kernel as mentioned above contains (50 to 55)% of oil which can be expelled by expellers of various types. Extraction process by using expellers is a very simple technique. It is a labour - intensive industry in which unskilled and semi- skilled labour is required. The process of oil extraction requires cooking of Kernels with steam at high temperature. This treatment has the following functions to perform:-

a) Rupture of the oil cells by the action of heat and moisture making oil readily available for extraction
b) Increase the fluidity of oil by increasing the temperature of meats and oil.
c) Coagulates the protein portion of meals.
d) Dries the meats to a moisture content suitable for extraction.

The seeds after cooking are fed to one side of the screw expeller where it is pressed by the action of worm and outer shell to get separated initially and cake which are removed at the other end. The cooked seeds should have 4 to 5 per cent moisture; higher moisture results in less oil yield and cake of higher oil content is obtained. The oil so obtained from the expeller is run into a storage tank filtered in a plate and frame filter press to remove suspended material and filled in tins or barrels for sale.

2. Source of Technology

Machinery and equipment can be obtained from the following address:

ITPG South Asia
5 lioned Edirsinghe Mawatha
Kirulapone
Colmgo 5
Tel. +94 1852149
Fax +94 1856188

B. ENGINEERING

1. Machinery and Equipment

The machinery and equipment required for the envisaged plant and estimated cost is shown in Table 5.1 below.

Table 5.1
MACHINERY AND EQUIPMENT REQUIREMENT AND ESTIMATED COST

Sr. No.	Description	Qty.	Cost, ['000 Birr]		
			LC	FC	TC
1	Decorticating machine	1			
2	Roasting equipment with thermostat	1			
3	Blanching equipment	1			
4	Coarse grinding m/c	1		780	780
5	Paste grinding & mixing m/c	1			
6	Packing unit-vacuum fill type	1			
7	Miscellaneous equipment (Tools, testing units, etc)	As req.			
	Freight, insurance, bank & handling charge		175	-	175
	Grand Total		**175**	**780**	**955**

2. Land, Building and Civil works

The total land requirement includes land for factory building, for administration building, and buildings for utilities and general purpose. Considering land area for expansion, gardening, internal roads and pathways, the total land requirement will be about 500 m^2, of this a total of 150 m^2 will be covered by buildings.

The cost of land leasing, at a rate of Birr 2.0 per m^2 per annum and for the coming 70 years, will be Birr 70,000. Considering a unit cost of Birr 1000 per m^2, an estimated total cost of buildings

will be Birr 150,000. The investment cost for land, buildings and civil works assuming that the total land lease cost will be paid in advance is estimated at Birr 228,000.

3. Proposed Location

The major raw material groundnut seed is harvested in Metekel area. It would, therefore, be appropriate to locate the plant in Metekel town.

VI. MANPOWER AND TRAINING REQUIREMENT

A. MANPOWER REQUIREMENT

The envisaged groundnut butter production plant requires 13 employees for both production and administrative works. The details of manpower requirement and estimated annual labour cost including fringe benefits is shown in Table 7.1 below.

Table 6.1
MANPOWER REQUIREMENT AND ANNUAL LABOUR COST

Sr. No.	Description	Req. No	Salary, Birr	
			Monthly	Annual
	A. Administrative			
1.	General manager	1	1800	21600
2.	Secretary	1	500	6000
3.	Store keeper	1	600	7200
4.	Cashier	1	400	4800
5.	General services	1	200	2400
	Sub-total	**5**		**42000**
	B. Production			
6.	Chemist, quality control	1	1000	12000
7.	Operators	2	600	14400
8.	Technicians	1	500	6000
9.	Unskilled workers	4	200	9600
	Sub-total	**8**		**4200**
	Employee Benefits (25% BS)			21,000
	Grand Total	**13**		**105,000**

B. TRAINING REQUIREMENT

It is recommended that machine operators and maintenance technicians (mechanics and electricians) and quality control workers need to be trained for two weeks on the production process, and on how to use production equipment during initial start -up of the plant by the machinery supplier. Total cost of training is estimated at Birr 10,000.

VII. FINANCIAL ANALYSIS

The financial analysis of the Groundnut butter project is based on the data presented in the previous chapters and the following assumptions:-

Construction period	1 years
Source of finance	30 % equity
	70 % loan
Tax holidays	3 years
Bank interest	7.5 %
Discounted cashflow	8.5 %
Repair and maintenance	3 % of the total cost of plant and machinery
Accounts receivable	30 days
Raw material, local	30 days
Raw materials, import	90 days
Work in progress	5 days
Finished products	30 days
Cash in hand	5 days
Accounts payable	30 days

A. TOTAL INITIAL INVESTMENT COST

The total initial investment cost of the project including working capital is estimated at 1.31 million, of which 67.9 per cent will be required in foreign currency.

The major breakdown of the total initial investment cost is shown in Table 7.1

Table 7.1
INITIAL INVESTMENT COST

Sr. No.	Cost Items	Total ('000 BIRR)
1	Land lease value	70
2.	Building and Civil Work	150
3.	Plant Machinery and Equipment	955
4.	Office Furniture and Equipment	35
5.	Vehicle	-
6.	Pre-production Expenditure*	77.37
7	Working Capital	21.31
	Total Investment cost	**1,308.68**
	Foreign share	**67.9%**

* *N.B Pre-production expenditure includes interest during construction (Birr 62.37 thousand), training (Birr 10 thousand), and (Birr 5 thousand) costs of registration, licensing and formation of the company including legal fees, commissioning expenses, etc.*

B. PRODUCTION COST

The annual production cost at full operation capacity of the plant is estimated at Birr 0.47 million (see Table 7.2). The material and utility cost accounts for 36.9 per cent while repair and maintenance take 4.28 per cent of the production cost.

Table 7.2
ANNUAL PRODUCTION COST AT FULL CAPACITY ('000 BIRR)

Items	Unit Cost	%
Raw Material and Inputs	151.66	31.84
Utilities	24.5	5.14
Maintenance and repair	20.4	4.28
Labour, direct	46.2	9.70
Factory overheads *	4.0	0.84
Administration Cost **	66.0	13.86
Total Operating Costs	**312.76**	**65.67**
Depreciation	113	23.73
Cost of Finance	50.52	10.61
Total Production Cost	**476.28**	**100**

C. FINANCIAL EVALUATION

1. Profitability

According to the projected income statement, the project will start generating profit in the 3rd year of operation. Important ratios such as profit to total sales, net profit to equity (Return on equity) and net profit plus interest on total investment (return on total investment) show an increasing trend during the lifetime of the project.

The income statement and the other indicators of profitability show that the project is viable.

**Factory overhead cost includes salaries and wages of supervisors, insurance of factory workers, social costs on salaries of direct labour, etc.*

*** Administrative cost includes salaries and wages, insurance, social costs, materials and services used by administrative staff etc.*

2. Break-even Analysis

The break-even point of the project including cost of finance when it starts to operates at full capacity (4^{th} year) is estimated by using income statement projection.

$$BE = \frac{\text{Fixed Cost}}{\text{Sales} - \text{Variable cost}} = 80\%$$

3. Pay-Back Period

The investment cost and income statement projection are used to project the pay-back period. The project's initial investment will be fully recovered within 7 years.

4. Internal Rate of Return and Net Present Value

Based on the cash flow statement, the calculated IRR of the project is 14% and the net present value at 8.5% discount rate is Birr 0.45 million.

D. ECONOMIC BENEFITS

The project can create employment for 13 persons. In addition to supply of the domestic needs, the project will generate Birr 72 thousand per annum in terms of tax revenue when it starts to operate at full capacity. Moreover, the Regional Government can collect employment, income tax and sales tax revenue. The establishment of such factory will have a foreign exchange saving effect to the country by substituting the current imports.