

1. PROFILE ON PRODUCTION OF BABY FOOD

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I. SUMMARY

This profile envisages the establishment of a plant for the production of baby food with a capacity of 2,000 tonnes per annum.

The present demand for the proposed product is estimated at 19,165 tonnes per annum. The demand is expected to reach at 40,878 tonnes by the year 2020.

The plant will create employment opportunities for 55 persons.

The total investment requirement is estimated at about Birr 13.65 million, out of which Birr 5.6 million is required for plant and machinery.

The project is financially viable with an internal rate of return (IRR) of 34 % and a net present value (NPV) of Birr 16.57 million discounted at 8.5%.

II. PRODUCT DESCRIPTION AND APPLICATION

The product is commonly known as infant food and is produced from pulses as well as other agricultural ingredients like soybean, fruits and vegetables. Baby food is a supplementary food prepared for children below the age of two years for the purpose of relieving mothers from intensive breast-feeding. The basic requirements for baby food are sweetness, palatability and tenderness. In addition, carbohydrates and proteins are the major nutrients in the formulation of infant foods. Baby food is first diluted in water and then boiled to form a stew or soup and finally served with spoons for children.

III. MARKET STUDY AND PLANT CAPACITY

A. MARKET STUDY

1. Past Supply and Present Demand

The country's requirement for baby food is met through domestic production and imports. Fafa Food Factory S.C. is the sole baby food producing factory in the country. These baby foods that are produced by this factory are known as Fafa, DUBE, EDGET and MITIN. Substantial quantity of imported baby foods like NIDO, COAST, CERILAC, NAN, GUIGOZ and S-26 are available in super markets and general merchandizing shops. Domestic production, import and the total supply of baby or infant food is presented in Table 3.1.

Table 3.1
SUPPLY OF BABY OR INFANT FOOD (TONNES)

Year	Domestic Production	% Share	Import	% Share	Total
1999	6183	94.56	356	5.44	6,539
2000	9,983	97.65	240	2.35	10,223
2001	11,693	96.73	395	3.27	12,088
2002	9,216	91.42	865	8.58	10,081
2003	15,379	92.56	1,236	7.44	16,615
2004	18,481	92.11	1,582	7.89	20,063
Average	11,823	93.82	779	6.18	12,602

Source:- Statically Abstract of CSA, for Domestic Production.

Ethiopian Customs Authority for Import.

Table 3.1 reveals that the demand for baby/ infant food is mainly met through domestic production. The average share of domestic production and import in the period 1999 – 2004 was 94% and 6%, respectively. When the total supply trend is analyzed it is found out that during the period of analyses the average growth rate in the past five years was 17.73%.

To estimate the current effective demand an annual average growth rate of 15% (which is slightly lower than the past trend) has been applied by taking the average total supply of year 1999 – 2004 as a base year. Accordingly, the current effective demand for baby /infant found is estimated at 19,165 tonnes.

2. Projected Demand

The demand for industrially processed baby food is influenced mainly by the baby /infant population, income of household and urbanization. Assuming there will be a modest growth of household income and urbanization, a growth rate of 6% is considered in projecting the demand for the product. The total projected demand and the unsatisfied demand is shown in Table 3.2.

Table 3.2
PROJECTED DEMAND FOR BABY FOOD (TONNES)

Year	Projected Quantity	Existing Production	Unsatisfied Demand
2008	20,315	11,823	8,492
2009	21,534	11,823	9,711
2010	22,826	11,823	11,003
2011	24,196	11,823	12,373
2012	25,648	11,823	13,825
2013	27,186	11,823	15,363
2014	28,818	11,823	16,995
2015	30,547	11,823	18,724
2016	32,379	11,823	20,556
2017	34,322	11,823	22,499
2018	36,381	11,823	24,558
2019	38,564	11,823	26,741
2020	40,878	11,823	29,055

3. Pricing and Distribution

Locally produced baby foods such as Fafas sold at Birr 12 per k.g in retail shops. Allowing 30% profit margin for distributors and retailers an ex-factory price of Birr 9.23 is recommended for the envisaged project.

The envisaged plant can use the existing wholesale and retail networks, which include: - department stores, merchandise shops and super markets to distribute its product.

B. PLNAT CAPACITY AND PRODUCTION PROGRAMME

1. Plant Capacity

Based on the unsatisfied demand for baby food and the minimum economic of scale, the annual capacity of the envisaged plant is proposed to be 2,000 tonnes. The proposed capacity is based on 300 working days and a single shift of 8 hours per day. Production can be doubled or tripled by introducing additional shifts if an increase is observed in the market demand.

2. Production Programme

At the initial stage of the production period, the plant would require some years to penetrate into the market and build technical capacity. Therefore, in the first and second year of production, the capacity utilization rate will be 70% and 90%, respectively. In the third year and thereafter, full capacity production shall be attained. Table 3.3 shows the production programme of the proposed project.

Table 3.3
PRODUCTION PROGRAMME (TONNES)

Sr. No.	Product	Production Year		
		2007	2008	2009-2016
1.	Baby Food	1,400	1,800	2,000
2.	Bran	112	144	160
3.	Capacity Utilization (%)	70	90	100

IV. MATERIAL AND INPUTS

A. RAW MATERIALS

The major raw materials used for the production of baby food are sorghum or wheat flour, soybean, chick peas, sweet potato, fruits, milk powder, etc. All raw materials except milk powder (which will be imported), are found in the region. The annual requirement and cost of raw materials is indicated in Table 4.1. The total annual cost of raw materials including auxiliary materials is estimated at Birr 10157.7 thousands.

Table 4.1
ANNUAL RAW MATERIALS REQUIREMENT AND COST
(AT FULL CAPACITY)

Sr. No.	Raw Material	Qty. (Tons)	Unit price/ton	Cost ('000 Birr)		
				FC	LC	Total
1.	Sweet potato	470	600	-	282	282
2.	Wheat flour	821	4,000	-	3284	3284
3.	Beans	312	2,900	-	904.8	904.8
4.	Soybean	235	4,500	-	1057.5	1057.5
5.	Chick beans	253	3,800	-	961.4	961.4
6.	Fruits	70	2,000	-	140	140
7.	Milk powder	126	28,000	2998.8	529.2	3528
	Total Cost			2998.8	7158.9	10157.7

Note: The plant at its full capacity operation can generate income by selling the by-product i.e. bran. It can generate about Birr168, 000 annually from the sale of this by-product to animal feed plants.

B. AUXILIARY MATERIALS

The baby food produced is packed in plastic bag of standard quality in 1Kg size each and repacked in card box. The total annual cost of auxiliary raw materials is estimated at birr 1.5 million. The annual requirement of auxiliary materials and their cost is indicated in Table 4.2.

Table 4.2
AUXILIARY MATERIAL REQUIREMENT AND COST
(AT FULL CAPACITY)

Sr. No.	Description	Qty. ('000 pcs)	Unit price	Cost ('000 Birr)
1	Plastic bags (1 kg)	2,000	0.25	500
2	Card box	2,000	0.5	1,000
	Total			1,500

C. UTILITIES

At full capacity, the annual consumption of electricity and water are 200,000 kWh and 22,000m³, respectively. Accordingly, the total annual cost of utilities is estimated to be Birr 215,720.

V. TECHNOLOGY AND ENGINEERING

A. TECHNOLOGY

1. Production Process

The major production processes in baby food manufacturing can be classified into four groups: cleaning, roasting, milling and blending. Initially, course impurities will be separated in vibrating screens with different mesh sizes. The material is, then, conveyed to different equipment such as destoners and scourers for further cleaning.

Before scouring, usually, beans and chick beans will be roasted. After scouring the different materials shall be milled and mixed according to a predetermined ratio.

2. Source of Technology

Various suppliers from Europe and Far East can be used as technology source. Among them, the following Indian companies can be contacted.

1. Flour Mills Private Ltd.
Calcutta, India.
Fax: +91-33-2433922.
2. Nova engineering
P.O.Chittilapilly, Trichur-680551, kerala
India
Tel: 00-91-487-2306125, 2306170, 2306435
Fax: 91-487-2308890, cell: 9447481890, 9895077644
E-mail: novaengg@rediffmail.com

B. ENGINEERING

1. Machinery and Equipment

The cost of machinery and equipment is estimated at Birr 5.6 million, of which about Birr 4.48 million is required in foreign currency. The list of machinery and equipment is indicated in Table 5.1.

Table 5.1**LIST OF MACHINERY AND EQUIPMENT**

Sr. No.	Description	Qty.
1.	Storage bins/silos	5
2.	Bucket elevators	12
3.	Screw conveyors	7
4.	Drum sieve	1
5.	Magnetic separator	1
6.	Destoner	1
7.	Roaster	1
8.	Scourer	1
9.	Milling machine including sifter set	Set
10.	Weigher	Set
11.	Aspirator	1
12.	Dehydrator	1
13.	Mixer	1
14.	Rotary Distributor	1
15.	Packing machine	1
16.	Lab. Equipment	Set

2. Land, Building and Civil works

The total area required by the envisaged project is estimated at 2,000m², of which the built-up area is 1,000m². The construction rate is estimated at Birr 2,500 per m² assuming that the building is constructed with EGA sheet roof, HCB wall, cement tile floor. The buildings and civil work construction cost is estimated at Birr 2.5 million. The total land lease cost, at the rate of Birr 0.1 per m² and 80 years of land holding, is estimated at Birr 16,000. The total cost of land, civil works and buildings is estimated at Birr 2,516,000.

3. Proposed Location

The location of the plant is a compromise between the raw material availability and market. The major consumers for baby food are the urban population. So, the location of the envisaged project is proposed to be in Shebedino woreda Leku town since it has resource potential for the production of baby food and near to the zonal town (about 27 km) for market.

VI. MANPOWER AND TRAINING REQUIREMENT

A. MANPOWER REQUIREMENT

The envisaged project requires a total manpower of 55 persons. The list of manpower and labour cost is indicated in Table 6.1. The annual cost of labour including fringe benefits is estimated at Birr 470,880.

Table 6.1
MANPOWER REQUIREMENT AND LABOUR COST

Sr. No.	Description	Req. No.	Monthly Salary (Birr)	Annual Salary (Birr)
1.	General Manager	1	2800	33,600
2.	Secretary	1	700	8,400
3.	Marketing Officer	1	1500	18,000
4	Sales person	1	900	10,800
5.	Purchaser	1	900	10,800
6.	Accountant	1	1500	18,000
7.	Cashier	1	500	6,000
8	Personnel	1	900	10,800
9	Store keeper	1	500	6,000
10	Production and technic manager	1	2400	28,800
11	Mechanic	2	1200	14,400
12	Electrician	2	1200	14,400
13	Quality Control Chemist	2	1800	21,600
14	Driver	2	900	10,800
15	Operators	16	9600	115,200
16	Laborers	18	4500	54,000
17	Guards	3	900	10,800
	Sub-Total	55	32,700	392,400
	Benefits (20% BS)		6540	78,480
	Grand Total	55	39,240	470,880

B. TRAINING REQUIREMENT

Training shall be carried out during plant erection and commissioning by the supplier of machinery and by the project. Once the production and Technic head, mechanics, electricians and quality control chemist are trained for about two weeks at the site by experts of the supplier, they can further train operators. Therefore, the cost of training is estimated to be Birr 50,000.

VII. FINANCIAL ANALYSIS

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

Construction period	1 year
Source of finance	30 % equity
	70 % loan
Tax holidays	3 years
Bank interest	8%
Discount cash flow	8.5%
Accounts receivable	30 days
Raw material local	30days
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 investment cost of the project including working capital is estimated at Birr 13.65 million, of which 29 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 Cost ('000 Birr)
1	Land lease value	2,516.0
2	Building and Civil Work	2,500.0
3	Plant Machinery and Equipment	5,600.0
4	Office Furniture and Equipment	125.0
5	Vehicle	200.0
6	Pre-production Expenditure*	823.1
7	Working Capital	1,889.8
	Total Investment cost	13,654.0
	Foreign Share	29

* N.B Pre-production expenditure includes interest during construction (Birr 673.11 thousand) training (Birr 50 thousand) and Birr 100 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 is estimated at Birr 14.02 million (see Table 7.2). The material and utility cost accounts for 84.67 per cent, while repair and maintenance take 2 per cent of the production cost.

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

Items	Cost	%
Raw Material and Inputs	11,657.70	83.13
Utilities	215.72	1.54
Maintenance and repair	280	2.00
Labour direct	282.53	2.01
Factory overheads	94.18	0.67
Administration Costs	188.35	1.34
Total Operating Costs	12,718.48	90.70
Depreciation	767.5	5.47
Cost of Finance	537.01	3.83
Total Production Cost	14,022.99	100

C. FINANCIAL EVALUATION

1. Profitability

According to the projected income statement, the project will start generating profit in the first 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 life-time of the project.

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

2. Break-even Analysis

The break-even point of the project including cost of finance when it starts to operate at full capacity (year 3) is estimated by using income statement projection.

$$\text{BE} = \frac{\text{Fixed Cost}}{\text{Sales} - \text{Variable Cost}} = 16 \%$$

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 3 years.

4. Internal Rate of Return and Net Present Value

Based on the cash flow statement, the calculated IRR of the project is 34 % and the net present value at 8.5% discount rate is Birr 16.57 million.

D. ECONOMIC BENEFITS

The project can create employment for 55 persons. In addition to supply of the domestic needs, the project will generate Birr 9.98 million in terms of tax revenue.