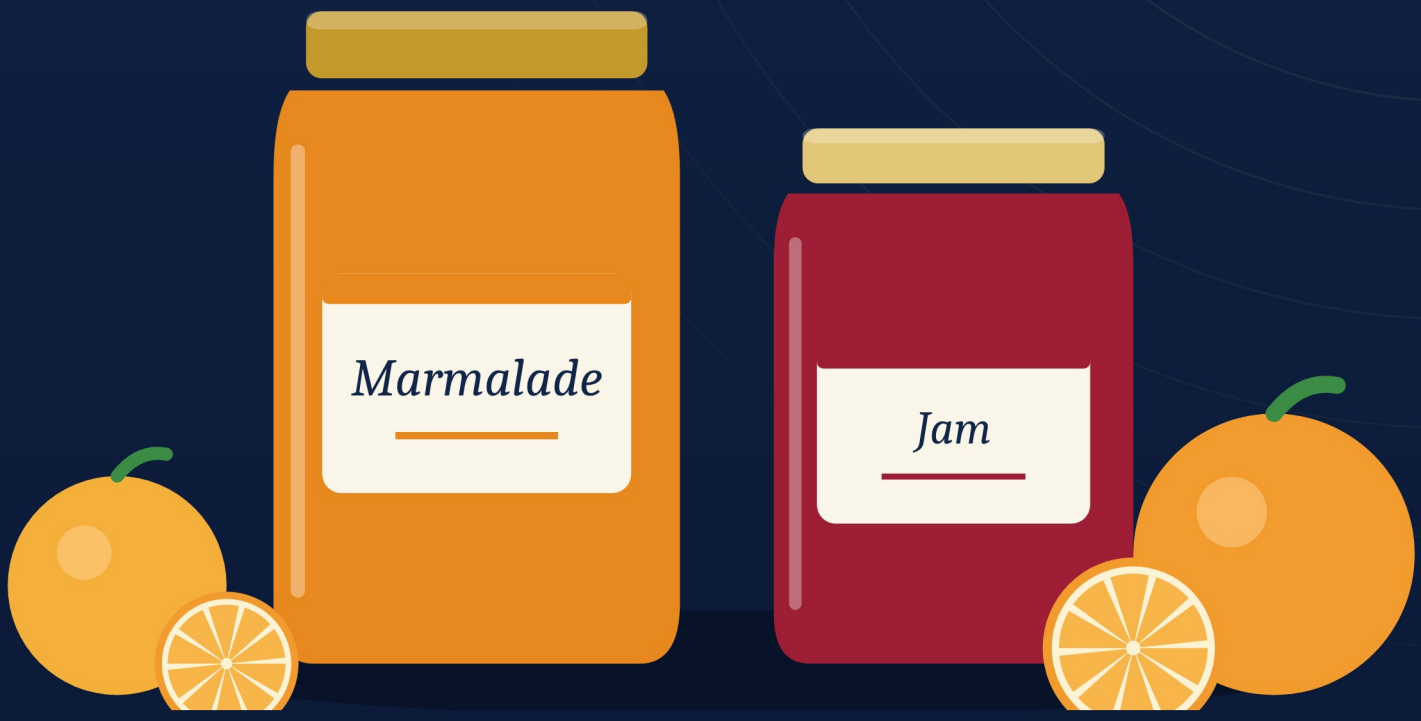
PROJECT FEASIBILITY STUDY · ETHIOPIA

Jam and Marmalade Manufacturing Plant

Feasibility Study

የጃም እና ማርማሌድ ማምረቻ ፋብሪካ የአዋጭነት ጥናት

A 300-tonne-per-year fruit jam and marmalade processing plant in Addis Ababa, Ethiopia



300 t/yr	19.6%	4.3 yrs	25
Plant capacity	Internal rate of return	Payback period	Jobs created

Contents

1 Executive Summary.....4
2 Product Description and Application.....5
3 Market Study.....6
3.1 Past Supply and Present Demand.....6
3.2 Demand Projection.....7
3.3 Pricing and Distribution.....8
4 Plant Capacity and Production Programme.....9
4.1 Plant Capacity.....9
4.2 Production Programme.....9
5 Materials and Inputs.....10
5.1 Raw Materials.....10
5.2 Auxiliary Materials.....10
5.3 Utilities.....10
6 Technology and Engineering.....11
6.1 Production Process.....11
6.2 Environmental Impact.....11
6.3 Machinery and Equipment.....12
6.4 Land, Buildings and Civil Works.....12
7 Human Resource and Training Requirement.....14
7.1 Human Resource Requirement.....14
7.2 Training Requirement.....14
8 Financial Analysis.....15
8.1 Basis and Assumptions.....15
8.2 Total Initial Investment Cost.....15
8.3 Production Cost.....16
8.4 Financial Evaluation.....17
9 Economic and Social Benefits.....19
10 Conclusions and Recommendations.....20
Annex A Financial Supporting Tables.....21

PREVIEW

Preview pages only · Full report available at Gebeya251.com

1 Executive Summary

This study assesses the establishment of a plant producing 300 tonnes of jam and marmalade a year in Addis Ababa. Jam and marmalade are bread spreads served alone or with margarine or butter, and are used by bakeries and pastry shops.

Demand is met by domestic production and imports. The present (2012) effective demand is estimated at 780 tonnes and is projected to reach 1,200 tonnes by 2017 and 1,846 tonnes by 2022. With existing domestic production of about 600 tonnes, the unsatisfied demand grows from 250 tonnes in 2013 to 1,246 tonnes in 2022.

The principal raw materials are fruit (orange, mandarin and lemon), sugar and citric acid. Fruit and sugar are available locally; citric acid and food-grade coated cans are imported.

The total investment cost, including working capital, is Birr 15.02 million, of which Birr 6.37 million (42.4%) is required in foreign currency. The project is financially viable: the IRR is 19.6% and the NPV at a 10% discount rate is Birr 6.80 million. The plant will employ 25 people.

Table 1.1: Project at a glance

Item	Description
Products	Fruit jam and marmalade in food-grade coated cans
Location	Industrial zone, Addis Ababa
Plant capacity	300 tonnes per year (single 8-hour shift, 270 days)
Production programme	80% of capacity in the first operating year, 90% in the second, 100% thereafter
Main raw materials	Fruit (450 t/yr), sugar (135 t/yr), citric acid
Land / built-up area	750 m² / 450 m²
Employment	25 persons
Total investment	Birr 15.02 million (fixed investment Birr 11.26 million)
Financing	30% equity, 70% bank loan at 10%
Price base	Constant 2012 prices, Ethiopian Birr

Table 1.2: Key financial indicators

Indicator	Value
Annual sales at full capacity	Birr 13.20 million
Annual production cost at full capacity	Birr 12.38 million
Internal rate of return (IRR)	19.6%
NPV at 10% discount rate	Birr 6.80 million
NPV at 18% discount rate	Birr 0.87 million
Payback period	About 4.3 years from start of operation
Break-even sales (full-capacity year)	79.8% of sales (29.6% on a cash basis)
Corporate income tax over project life	Birr 5.71 million

The project saves foreign exchange by substituting imports, creates backward linkages with fruit growers and sugar producers, and generates income tax and payroll tax revenue.

Preview pages only · Full report available at Gebeya251.com

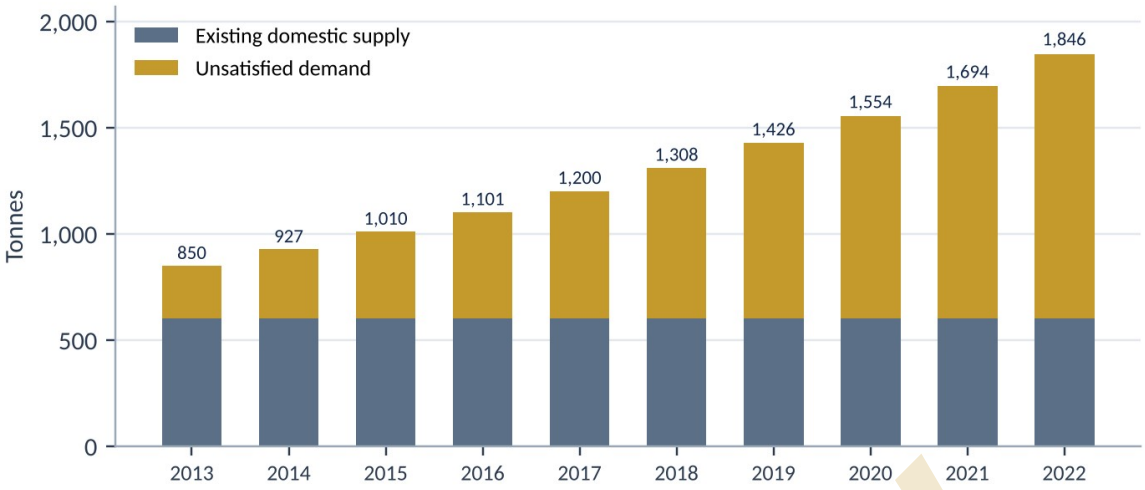


Figure 3.2: Projected demand, existing supply and unsatisfied demand, 2013–2022

Source: Table 3.3.

3.3 Pricing and Distribution

Marmalade currently retails at Birr 55 per kg. Allowing a 25% margin for distributors, an ex-factory price of Birr 44 per kg is adopted.

The most suitable distribution system relies on wholesalers, who in turn supply retail outlets such as supermarkets and grocery shops.

PREVIEW

Preview pages only · Full report available at Gebeya251.com

6 Technology and Engineering

6.1 Production Process

Production processes and recipes vary from fruit to fruit. The general processing steps are as follows (Figure 6.1):

- Fresh fruit is sorted on a control belt, washed in a washing machine, passed through continuous boiling equipment, pulped and transferred to a storage tank.
- The required amount of pulp is weighed and, where necessary, boiled with water.
- Pectin, previously mixed with five times its weight of sugar taken from the recipe, is added while the batch is stirred vigorously.
- The batch is boiled for about two minutes to dissolve the components completely, and the remaining sugar is added while boiling continues.
- The batch is boiled down quickly to the target Brix; citric acid is added, which also helps remove froth.
- The hot product is filled into pre-cleaned containers, which are seamed, inverted for three minutes to pasteurise the lid, and labelled.

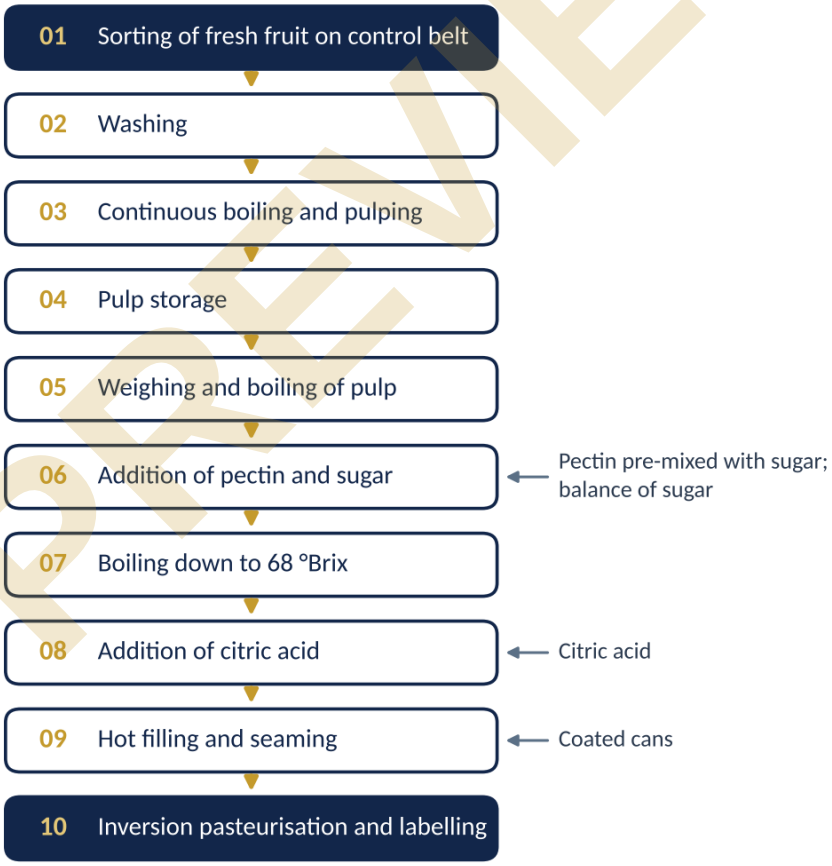


Figure 6.1: Jam and marmalade production process

6.2 Environmental Impact

The plant emits no pollutants other than wash water, which must be connected to a proper drainage line. Fruit peel and pulp residues can be used as animal feed or compost. The project is therefore environmentally benign.

PREVIEW

Preview pages only · Full report available at Gebeya251.com

8.4.5 Net Present Value

Net present value (NPV) is the sum of the project's net cash flows discounted to Year 1. At the base-case discount rate of 10%, the NPV is Birr 6.80 million. Table 8.4 shows the NPV at higher discount rates, which reflect the higher cost of capital prevailing in the Ethiopian market.

Table 8.4: Net present value at alternative discount rates

Discount rate	NPV (Birr '000)	Result
10% (base case)	6,803	Positive
15%	2,735	Positive
18%	867	Positive

Source: Calculated from the net cash flows in Table A.5.

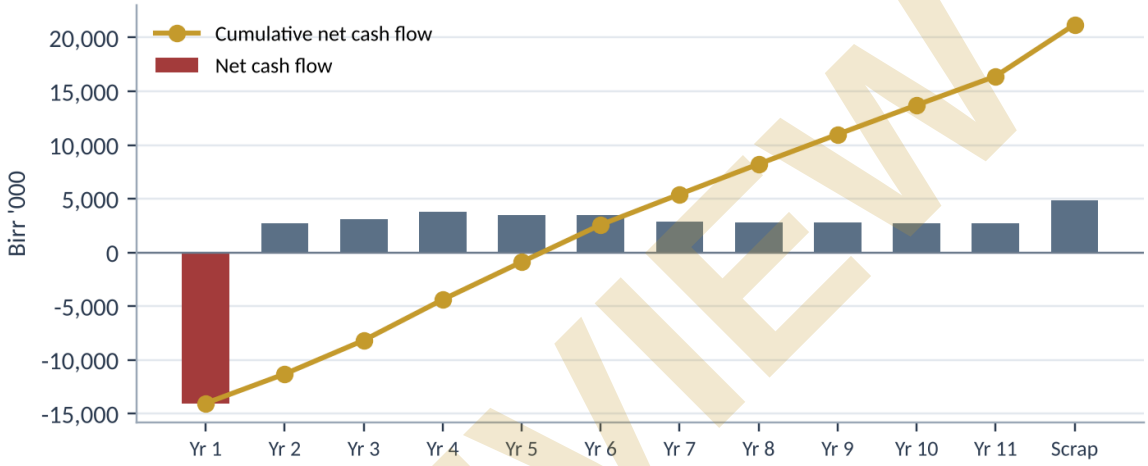


Figure 8.2: Net cash flow and cumulative net cash flow over the project life

Source: Table A.5.

PREVIEW

Preview pages only · Full report available at Gebeya251.com