

POTATO PROCESSING



1.0 INTRODUCTION

Potato is probably the most popular food item in the Indian diet. It is grown all over the country with Uttar Pradesh growing the maximum quantity. Potato is a very rich source of starch. It also contains phosphorus, calcium, iron and some vitamins. Apart from use of fresh potatoes for the purpose of making vegetables and gravy, they are dehydrated in the forms of slices, sticks, cubes or powder to impart better shelf life. Yet another popular use is to make wafers or chips.

2.0 PRODUCTS

2.1 Applications

Potatoes are grown and used in the Indian culinary since centuries with many end-uses as explained above. However, this note deals with making of potato chips as this product is very popular all over the country and can be manufactured even on a small scale. Potatoes are grown in many parts of the country and thus this is not a location-specific product. This note considers Manipur as the proposed location.

2.2 Quality standards and compliances

Provisions under the PFA Act must be adhered to. BIS has specified quality standards vide IS 2397:1988

3.0 MARKET POTENTIAL

3.1 Demand and Supply

Rapid urbanisation and improving standards of living have seen manifold increase in the demand of potato chips. Easy availability, convenient packaging, affordable prices and

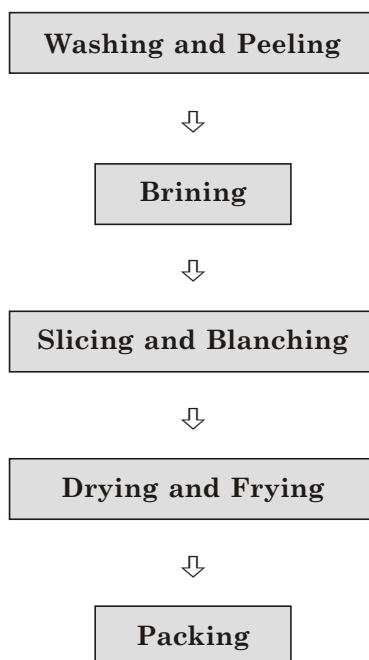
nutritious values are some other reasons for their popularity even in far flung rural areas. There exists consumer as well as bulk markets.

3.2 Marketing Strategy

There are some international as well as national brands but majority of the market is penetrated by local manufacturers due to competitive pricing, easy availability at many outlets and very efficient and timely supply as well as replacement. With proper strategy and network, it is possible to penetrate the market.

4.0 MANUFACTURING PROCESS

Fully grown and ripe potatoes are thoroughly washed before peeling them. Then these potatoes are trimmed and put in brine water for 30-35 minutes to prevent browning. They are afterwards cut in the required sizes on slicing machine. These slices are blanched in boiling water and are then placed on drying trays which are then put in the drying machine. Temperature of dryer is maintained in the range of 140 to 150^o F. After drying, they are fried in edible oil to make them crisp and brown and then they are packed in polythene bags. The chips could be salty or spicy. Some other flavours which are locally popular can also be tried. The process flow chart is as under:



5.0 CAPITAL INPUTS

5.1 Land and Building

Land of 200 sq.mtrs. with built-up area of 100 sq.mtrs. would be adequate. Equipments would occupy around 60 sq.mtrs and rest of the area can be utilised for storage, a small office etc. The land would cost Rs. 60,000/- whereas cost of building is estimated to be Rs. 2.50 lacs.

5.2 Plant and Machinery

Keeping in mind the potential market and economic viability, it is suggested to install production capacity of 40 tons of potato chips per year with 2 shift working and 300 working days each year. To achieve this capacity, following equipments are required:

Item	Qty.	Price (Rs.)
Slicer made of SS with attachments and electric motor	1	30,000
Electrically-operated dryer with trolleys and 96 trays	1	80,000
Coal-fired Furnace	1	15,000
Motorised Potato Peeling Machine	1	15,000
Automatic Sealing Machine	1	10,000
Cutting and peeling knives, aluminium utensils, weighing scale, etc.	--	30,000
	Total	1,80,000

5.3 Miscellaneous Assets

A provision of Rs. 35,000/- would take care of furniture, storage facilities, tables, exhaust fans, etc.

5.4 Utilities

Power requirement shall be 10 HP whereas per day water requirement will be 2,000 ltrs. Coal requirement for furnace shall be about 1 ton every month.

5.5 Raw Material

The all-important raw material is good quality potatoes. Potatoes have high water content. Hence total process loss shall be almost 30%. The state of Manipur produces around 70,000 tonnes of potatoes every year. Thus, procurement of the required quantity shall not be a bottleneck. Other materials like salt, spices, preservatives etc. are easily available.

6.0 MANPOWER REQUIREMENTS

Particulars	Nos.	Monthly Salary (Rs.)	Total Monthly Salary (Rs.)
Skilled Workers	2	1,800	3,600
Semi-skilled Workers	2	1,500	3,000
Helpers	2	1,200	2,400
Salesmen	1	1,500	1,500
		Total	10,500

7.0 TENTATIVE IMPLEMENTATION SCHEDULE

Activity	Period (in months)
Application and sanction of loan	2
Site selection and commencement of civil work	1
Completion of civil work and placement of orders for machinery	4
Erection, installation and trial runs	1

8.0 DETAILS OF THE PROPOSED PROJECT

8.1 Land and Building

As explained earlier, land of about 200 sq.mtrs. with built-up area of 100 sq.mtrs. would suffice. Land may cost about Rs. 60,000/- whereas the cost of construction would be in the vicinity of Rs. 2,50,000/-.

8.2 Plant and Machinery

The total cost under this head is estimated to be Rs. 1.80 lacs as explained earlier.

8.3 Miscellaneous Assets

An estimated expenditure under this head is Rs. 35,000/-.

8.4 Preliminary & Pre-operative Expenses

Expenditure like registration and administrative charges, pre-production expenses, trial run expenses etc. is estimated to be Rs. 35,000/-.

8.5 Working Capital Requirement

At 60% capacity utilisation in the first year, the total working capital needs will be Rs. 1.36 lacs consisting of bank finance of Rs. 0.87 lacs and margin of Rs. 0.49 lacs. The detailed calculations are as under:

(Rs. in lacs)

Particulars	Period	Margin	Total	Bank	Promoters
Stock of Raw and Packing Materials	½ Month	25%	0.18	0.13	0.05
Stock of Finished Goods	½ Month	25%	0.28	0.21	0.07
Receivables	½ Month	25%	0.70	0.53	0.17
Working Capital	1 Month	100%	0.20	--	0.20
		Total	1.36	0.87	0.49

8.6 Cost of the Project and Means of Financing (Rs. in lacs)

Item	Amount
Land and Building	3.10
Plant and Machinery	1.80
Miscellaneous Assets	0.35
P&P Expenses	0.35
Contingencies @ 10% on Building and Plant & Machinery	0.50
Working Capital Margin	0.49
Total	6.59
Means of Finance	
Promoters' Contribution	1.89
Loan from Bank/FI	4.70
Total	6.59
Debt Equity Ratio	2.48:1
Promoters' Contribution	29%

Financial assistance in the form of grant is available from the Ministry of Food Processing Industries, Govt. of India, towards expenditure on technical civil works and plant and machinery for eligible projects subject to certain terms and conditions.

9.0 PROFITABILITY CALCULATIONS

9.1 Production Capacity and Build-up

The rated production capacity of the plant would be 40 tonnes per year and it is anticipated that it shall be operated at 60% and 75% respectively during first two years.

9.2 Sales Revenue at 100%

For a new entrant, it becomes very difficult to capture the market. Hence, it is assumed that the net selling price will be Rs.55/- per kg. or Rs. 55,000/- per ton. Thus, the total sales realisation will be Rs. 22.00 lacs.

9.3 Raw Materials Required at 100%

(Rs. in lacs)

Product	Qty. (Tonnes)	Rate per Ton (Rs.)	Value
Potatoes	58	8,000	4.64
Salt, Spices, Preservatives, Edible Oil etc.	--	--	1.00
Hard coke	12	1,000	0.12
Packing Materials	--	--	1.50
		Total	7.26

9.4 Utilities

Annual cost under this head at 100% activity level shall be Rs.50, 000/-.

9.5 Selling Expenses

Since the unit will be entering the competitive market, it is necessary to undertake advertisements in local media. There will be other costs like transportation and selling commission. Hence, a provision of 25% of sales value is adequate every year.

9.6 Interest

Interest on term loan of Rs. 4.70 lacs is calculated @ 12% per annum assuming repayment in 3 years including a moratorium period of 6 months whereas on bank assistance for working capital, it is calculated @ 14% per annum.

9.7 Depreciation

It is computed on WDV basis and rates assumed are 10% on building and 20% on plant and machinery.

10.0 PROJECTED PROFITABILITY

(Rs. in lacs)

No.	Particulars	1st Year	2nd Year
A	Installed Capacity	--- 40 Tonnes ---	
	Capacity Utilisation	60%	75%
	Sales Realisation	13.20	16.50
B	Cost of Production		
	Raw and Packing Materials	4.35	5.45
	Utilities	0.30	0.38
	Salaries	1.26	1.50
	Stores & Spares	0.18	0.24
	Repairs & Maintenance	0.24	0.33
	Selling Expenses @ 25%	3.30	4.15
	Administrative Expenses	0.36	0.48
	Total	9.99	12.53
C	Profit before Interest & Depreciation	3.21	3.97
	Interest on Term Loan	0.46	0.27
	Interest on Working Capital	0.13	0.17
	Depreciation	0.68	0.57
	Net Profit	1.94	2.96
	Income-tax @ 20%	0.40	0.60
	Profit after Tax	1.54	2.36
	Cash Accruals	2.22	2.93
	Repayment of Term Loan	0.85	1.70

11.0 BREAK-EVEN ANALYSIS

(Rs. in lacs)

No	Particulars	Amount	
[A]	Sales		13.20
[B]	Variable Costs		
	Raw and Packing Materials	4.35	
	Utilities (70%)	0.21	
	Salaries (70%)	0.90	
	Stores & Spares	0.18	
	Selling Expenses (70%)	2.31	
	Admn. Expenses (50%)	0.18	
	Interest on WC	0.13	8.26
[C]	Contribution [A] - [B]		4.94
[D]	Fixed Costs		3.00
[E]	Break-Even Point (D ÷ C)		61%

12.0 [A] LEVERAGES

Financial Leverage

$$\begin{aligned} &= \text{EBIT/EBT} \\ &= 2.53 \div 1.94 \\ &= 1.30 \end{aligned}$$

Operating Leverage

$$\begin{aligned} &= \text{Contribution/EBT} \\ &= 4.94 \div 1.94 \\ &= 2.55 \end{aligned}$$

Degree of Total Leverage

$$\begin{aligned} &= \text{FL/OL} \\ &= 1.30 \div 2.55 \\ &= 0.51 \end{aligned}$$

[B] Debt Service Coverage Ratio (DSCR)

(Rs. in lacs)

Particulars	1st Yr	2nd Yr	3rd Yr
Cash Accruals	2.22	2.93	3.30
Interest on TL	0.46	0.27	0.11
Total [A]	2.68	3.20	3.41
Interest on TL	0.46	0.27	0.11
Repayment of TL	0.95	1.90	1.85
Total [B]	1.41	2.17	1.96
DSCR [A] ÷ [B]	1.90	1.47	1.73
Average DSCR	----- 1.72 -----		

[C] Internal Rate of Return (IRR)

Cost of the project is Rs. 6.59 lacs.

(Rs. in lacs)

Year	Cash Accruals	16%	18%	20%	24%	28%	32%
1	2.22	1.91	1.88	1.85	1.79	1.73	1.68
2	2.93	2.18	2.10	2.03	1.90	1.79	1.68
3	3.30	2.12	2.01	1.91	1.73	1.57	1.44
4	3.56	1.97	1.84	1.72	1.51	1.33	1.17
5	3.88	1.85	1.70	1.56	1.32	1.13	0.97
	15.89	10.03	9.53	9.07	8.25	7.55	6.94

The IRR is around 35%.

Some of the machinery suppliers are

1. Archana Machinery stores, Guwahati
2. Industrial Equipments, Guwahati
3. East End Engineering Company, 173/1 Gopalrai Thakur Road, Kolkata 700035.
Tel. No. 25773416/6324