

PROJECT PROFILE

ON

SHG - OTHER INDUSTRIES

CRUDE PAPAIN

Month & Year
December 2008

**PREPARED BY
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Supported by

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STIFTUNG **FÜR DIE FREIHEIT**

CRUDE PAPAIN

INTRODUCTION

Papain is one of more than 1000 known individual enzymes of protein substances produced by living cells which possesses the ability to catalyse specific chemical reactions. The papain is the dried latex obtained from the green fruit of papaya (carica Papaya) and it is becoming increasingly important enzyme having proteolytic function for using in food , brewing, dairy, baking, pharmaceutical, tanning and textile industries.

MARKET

The total estimated production of Papain in India was 35.54 MTs in 1987. This has increased to current level of 100 tonnes per annum. Out of this 35 tonnes is BPC grade papain and the rest is purified papain . 55% of the BPC grade papain is consumed internally and the rest is exported, while 90% of the purified papain is exported. With the liberalization of the industries several user industries are growing well which use papain.

The principal producers of crude papain are Zaire, Tanzania, Uganda and Sri Lanka. Most of the spray dried papain comes from Zaire. The principal importing countries are the United States, Japan, United Kingdom, Belgium and France. Almost all the best quality papain goes to the United States. Crude papain is used, in Britain, in the brewing industry for chill proofing beer and lager. Another use for papain is in the meat industry for the tenderisation of meat and the production of meat tenderising powders.

INSTALLED CAPACITY

The installed capacity of the proposed unit is manufacturing about 14 Kgs of BPC grade papain per day. On this basis the annual capacity will be 4200 Kgs Papain

PLANT AND MACHINERY

The following items of plant and machinery are required for the project.

Items	Qty	Value-Rs.
Vacuum Shelf Drier	1	160000

De-humidifier	1	55000
Hammer mill	1	100000
Blender	1	80000
Packaging machine	1	35000
Laboratory equipment	1	60000
Total		490000

MANUFACTURING PROCESS

Papaya Latex is mixed immediately after collection with Potassium Metabisulphate at the rate of 5 grams per kg of latex and stored in cold temperature (0 degree to 10 degree C) until processed. The latex is then passed through a 40 mesh S.S Sieve to remove the extraneous materials like stalks, leaves, sand, etc which might have fallen during collection.

The sieved latex thus obtained above is spread into trays at the rate of 0.5 Kg per sq.ft area and dried in a vacuum shelf drier at 27 “ vacuum and temperature of 50 degree C. after complete drying, which normally takes about 4 hours, the trays are removed from the drier, the dried papain scrapped out from the trays , mixed with Potassium meta bisulphate at the rate of 5 grams/ Kg and powdered in a hammer mil or roller mill to pass through 80 mesh sieve.

The powdered papain is tested for its propteolytic activity and diluted by lactose powder to get the BPC grade papain. Normally equal quantity of lactose to the papain is required for getting BPC quality. The diluted and standardized papain powder is first packed in Polyethylene bags , which in turn are placed in rigid containers and sealed air-tight. For longer storage life it is preferred to pack the bags in metallic containers and sealed under vacuum.

RAW MATERIALS

The raw material required for the production at full capacity is given below. Tamilnadu Agricultural University Coimbatore have developed CO2 & CO5 varieties which are suitable for obtaining good latex production.

For obtaining 50-60 kgs of latex per day, for 300 days in a year, about 25 acres of cultivation of Papapya is needed. This will produce about 7000 kgs of Latex which will yield about 4200 kgs of Papain. In this project Papyra latex is proposed

to be purchased from outside farmers at the rate of Rs 30.00 kg of latex. If own land is available cultivation can be rested to and the cost will be reduced.

For	MTs	4200		
Quantity				
KGs				
		Qty	Rate	Value
Latex		7000	30.00	210000
Potassium Metabisulphate		90	18.00	1620
Total				211620
TOTAL	4200	Rs.		2.12
for		lakhs		
Raw material cost per kg				50.39
Packing charges	4200		1.00	0.04

LOCATION LAND AND BUILDING

The infrastructural facilities required for the project by way of land and building are the following.

Built up area-Sq.ft	1000
Rent p.m.-Rs	2000
Advance-10 months.Rs	20000

UTILITIES

POWER

The utilities required for the project are the following

Three phase	KW	15.00
Power charges Rs.lakhs p.a		1.71
Water-For process-Litres per day		5000
For human consumption-ltr/day		200

MANPOWER

The manpower requirement for the project is given below

Monthly	Total
wages	

Supervisor	1	3000	3000
Skilled	2	2000	4000
Helpers	2	1500	3000
sub total			10000
Add benefits		20%	2000
Total per month			12000
TOTAL PER ANNUM-Rs. lakhs			1.44

COST OF PROJECT AND MEANS OF FINANCE

The cost of project and Means of Finance is estimated as given below

1. COST OF PROJECT

	[Rs.lakhs]
Land & Building (Advance)	0.20
Plant & Machinery	4.50
Other Misc. assets	0.03
Pre-Operative expenses	0.05
Margin for WC	0.10
	4.88

2. MEANS OF FINANCE

Capital	1.50
Term Loan	3.38
	4.88

-The term loan proposed is 75% of the Plant and machinery value.

- The promoters will bring in the required capital contribution to the project.

COST OF PRODUCTION AND PROFITABILITY

A cost and profitability statement projected for the first 5 years of operations is given in Annexure. The profitability is based on the following assumptions.

Assumptions

Installed capacity	4200 Kgs of Papain per annum
Capacity utilisation	Year-1 -60% Year -2 -70% Year-3 onwards- 80%
Selling price	Rs.200.00 per kg
Raw materials	As per the details given above
Packing materials	As per details given above
Power	Rs.1.71 lakhs per annum at 100%
Wages and salaries	Rs. 1.44 lakhs with increase 5% every year.
Repairs and Maintenance	Rs.0.12 lakh per annum
Depreciation	Written down value method -15 % on machinery
Selling general and administrative expenses	Rs.10000 per month
Interest on Term loan	10% per annum
Interest on working capital	10 % per annum
Income tax	33.66 % on profits

ASSESSMENT OF WORKING CAPITAL

The following levels are projected for working capital

Months	Values	%	Margin	Bank
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	Consumptions			Amount	Finance
Raw Materials	0.50	0.05	100%	0.05	0.00
Expenses	1.00	0.05	100%	0.05	0.00
		0.10		0.10	0.00

The bank finance is not proposed as the working capital margin will be met by the promoters and the bank finance is not proposed.

PROFITABILITY RATIOS

The project ensures good profits on investment and sales turnover.

DEBT SERVICE COVERAGE RATIO

The debt service coverage ratio of this concern is very high as the Term loan component is too low and the returns are high in this project.

BREAK EVEN LEVEL

The break even level of the unit is 42% of the installed capacity

LIST OF MACHINERY SUPPLIERS

1. Jyoti Industries
31, Pampa Mahakavi Road
Bangalore 560 004
2. K.Sons International
B-77, Industrial Estate
Rajaji Nagar
Bangalore 560044

RAW MATERIAL SUPPLIERS

Local farmers and own farming

FINANCIAL ASPECTS

1. COST OF PROJECT

	[Rs.lakhs]
Land & Building (Advance)	0.20
Plant & Machinery	4.50
Other Misc. assets	0.03
Pre-Operative expenses	0.05
Margin for WC	0.10
	<u>4.88</u>

2. MEANS OF FINANCE

Capital	1.50
Term Loan	3.38
	<u>4.88</u>

3. COST OF PRODUCTION & PROFITABILITY STATEMENT

Years	[Rs.lakhs]				
	1	2	3	4	5
Installed Capacity Kgs	4200	4200	4200	4200	4200
Utilisation	60%	70%	80%	80%	80%
Production/Sales Kgs	2520	2940	3360	3360	3360
Selling Price	Rs.300 perKg				
Sales Value (Rs.lakhs)	7.56	8.82	10.08	10.08	10.08
Raw Materials	1.27	1.48	1.69	1.69	1.69
Packing Materials	0.03	0.03	0.03	0.03	0.03
Power	1.03	1.20	1.37	1.37	1.37
Wages & Salaries	1.44	1.47	1.50	1.53	1.56
Repairs & Maintenance	0.12	0.13	0.14	0.15	0.17
Depreciation	0.68	0.57	0.49	0.41	0.35
Cost of Production	<u>4.56</u>	<u>4.88</u>	<u>5.22</u>	<u>5.19</u>	<u>5.18</u>

Selling, Admin, & General exp	1.20	1.26	1.32	1.39	1.46
Interest on Term Loan	0.34	0.30	0.21	0.21	0.21
Interest on Working Capital	0.00	0.00	0.00	0.00	0.00
Total	6.10	6.44	6.75	6.79	6.85
Profit Before Tax	1.46	2.38	3.33	3.29	3.23
Provision for tax	0.49	0.80	1.12	1.11	1.09
Profit After Tax	0.97	1.58	2.21	2.18	2.14
Add:	0.68	0.57	0.49	0.41	0.35
Depreciation					
Cash Accruals	1.65	2.15	2.70	2.60	2.50
Repayment of Term loan	0.00	0.85	0.85	0.85	0.83

4. WORKING CAPITAL:

	Months Consumptions	Values	%	Margin Amount	Bank Finance
Raw Materials	0.50	0.05	100%	0.05	0.00
Expenses	1.00	0.05	100%	0.05	0.00
		0.10		0.10	0.00

6. PROFITABILITY RATIOS BASED ON 80% UTILISATION

$$\frac{\text{Profit after Tax}}{\text{Sales}} = \frac{2.21}{10.08} = 22\%$$

$$\frac{\text{Profit before Interest and Tax}}{\text{Total Investment}} = \frac{3.54}{4.88} = 73\%$$

$$\frac{\text{Profit after Tax}}{\text{Promoters Capital}} = \frac{2.21}{1.50} = 147\%$$

7. BREAK EVEN LEVEL

Fixed Cost (FC):

	[Rs.lakhs]
Wages & Salaries	1.50
Repairs & Maintenance	0.14
Depreciation	0.49
Admin. & General expenses	1.32
Interest on TL	0.21
	<u>3.66</u>

Profit Before Tax (P) 3.33

$$\text{BEL} = \frac{\text{FC} \times 100}{\text{FC} + \text{P}} = \frac{3.66}{6.99} \times \frac{80}{100} \times 100$$

42% of installed capacity