

# JAGGERY FROM SUGARCANE



## 1.0 INTRODUCTION

Sugar industry in India is a well-developed industry and one of the largest after textiles. It provides rural employment opportunities and plays an important role in Indian economy. Jaggery is also manufactured from sugarcane juice and is very widely used not only in individual households but also in many eateries, restaurants, clubs and hostels and it has certain industrial applications as well. Manufacture of sugar involves many technical aspects and the capital investment is also on the higher side. Compared to this, production of jaggery is very simple and the capital cost is also very limited. Due to its wide applications, the market for jaggery is continuously growing.

## 2.0 PRODUCTS

Jaggery is a typical Indian product with several uses in daily food preparations and it is also used to make many sweet food preparations. This is a product with scattered market and can be manufactured in the states like Maharashtra, UP, Gujarat, Bihar, Jharkhand etc.

**2.1 Strict compliance with FPO and PFA is necessary.**

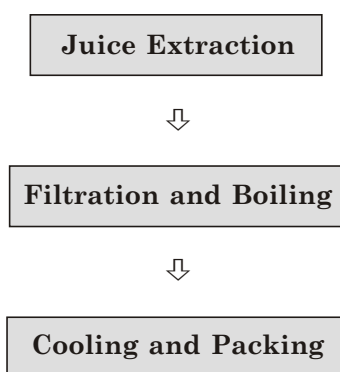
## 3.0 MARKET POTENTIAL

The demand for jaggery is steadily growing many folds in the urban, rural and semi-urban areas. There are several applications of jaggery and almost all Indian households use it on day-to-day basis. Market for jaggery is round the year whereas its production is only during the sugarcane season and thus factory works for around 6 to 7 months every year. Apart from individual households, it is used in large quantities in restaurants, road-side dhabas, other eateries, hostels and clubs and by caterers. It has shelf-life of more than couple of months. Its production is undertaken at several places but Maharashtra, Uttar Pradesh,

Bihar and Tamil Nadu are the leading manufacturers. In view of constantly growing market, it should not be difficult for a new entrant to enter and capture the market.

#### 4.0 MANUFACTURING PROCESS

Jaggery manufacturing is done on a small scale by a group of farmers. The juice is extracted from fresh sugarcane. Then it is filtered and boiled in wide, shallow iron pans with continuous stirring and, simultaneously soda or bhindi juice is added in required quantity. While boiling, brownish foams come at the top which are continuously removed to get golden yellow colour of jaggery. The consistency of the juice becomes thick and then it is poured into the small to medium sized iron or aluminum cans where blocks of jaggery are formed after cooling. Size of the blocks can vary from 1 kg. to 12 kgs. Finally, these blocks are packed in gunny bags. From 100 kgs. of sugarcane, 10 kgs. of jaggery is made. The process flow chart is as under:



#### 5.0 CAPITAL INPUTS

##### 5.1 Land and Buildings

The total land requirement would be 500 sq.meters which may cost Rs. 1.50 lacs. The built up area requirement is estimated to be 300 sq.mtrs. and the rate of construction is taken at Rs.1500/sq.mtr. since the roofing could be of asbestos sheets. The cost of construction would be Rs.4.50 lacs.

##### 5.2 Plant and Machinery

This is a seasonal activity and the plant generally runs from October to March-April. To produce 200 tons of jaggery every season, following machines shall be required:

Particular	Qty.	Rs.
Double Roller Sugar Cane Crushers Operated by 2.5 HP Motor Plastic Juice Storage Tanks No.4	No.2	80,000
Dimension of about 3 x 2 x 1 Mts.		60,000
1.5 Meters diameter Iron Pans with 2-3 handles to handle	No.2	10,000
Weighing Bridge 100 Kgs cap	No.1	10,000
Laboratory Equipments -	One set	5,000
Strong Iron Scrappers with Long handle	No.4	2,000
Tools and Equipments	4 Sets	5,000
<b>Total</b>		<b>1,72,000</b>

### 5.3 Miscellaneous Assets:

Some other assets like furniture & fixtures, storage facilities, HDPE barrels, bag sealing machine etc. would cost around Rs. 1.00 lac.

### 5.4 Utilities

The power requirements shall be 40 HP whereas per day water requirement during the season shall be 3000 ltrs.

### 5.5 Raw and Packing Materials

The main raw material is sugarcane with minimum 19.0 Brix reading. The extraction of juice from the sugarcane works out to about 45%. The states of Bihar and Jharkhand produce large quantity of sugarcane and availability should not be a bottleneck. Other materials like soda/bhindi juice shall be available locally. Gunny bags of different capacity shall be the packing material.

## 6.0 MANPOWER REQUIREMENTS:

Particulars	No	Monthly Salary (Rs.)	Total Monthly Salary (Rs.)
Skilled Workers	4	2,500	10,000
Helpers	6	1,250	7,500
Salesman	1	2,500	2,500
		<b>Total</b>	<b>20,000</b>

## 7.0 TENTATIVE IMPLEMENTATION SCHEDULE

Activity	Period (in months)
Application and sanction of loan	1.5
Site selection and commencement of civil work	0.5
Completion of civil work and placement of orders for machinery	1.5
Erection, installation and trial runs	0.5

### 8.1 Land and Building

(Rs. in lacs)

Particulars	Area (Sq.Mtrs)	Cost
Land	500	1.50
Building	300	4.50
	<b>Total</b>	<b>6.00</b>

### 8.2 Plant and Machinery

The total cost of machinery is estimated to be Rs.1.72 lacs, as explained earlier.

### 8.3 Miscellaneous Assets

The provision for miscellaneous assets of Rs. 1.00 lac shall be adequate as explained earlier.

### 8.4 Preliminary and Pre-Operative Expenses

The registration charges, establishment expenses, trial run expenses, interest during implementation etc would be around Rs.1.00 lac.

### 8.5 Working Capital Requirement

This is a seasonal business and sugarcane is available on credit. Main requirement is for post-sales for which a lump sum provision of Rs.1 lac is made comprising margin of Rs.30,000/- and bank finance of Rs. 70,000/-.

### 8.6 Cost of the Project and Means of Financing:

(Rs. in lacs)	
Items	Amount
Land and Buildings	6.00
Machinery	1.72
Miscellaneous Assets	1.00
Preliminary and Pre-operative Expenses	1.00
Contingencies @ 10% on land and building and machinery	0.75
Working Capital Margin	0.30
<b>Total</b>	<b>10.77</b>
<b>Means of Finance</b>	
Promoter's Contribution	3.27
Bank Loan/ Financial Institutions	7.50
<b>Total</b>	<b>10.77</b>
Debt Equity Ratio	2.29: 1
Promoters' Contribution	30%

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 installed production capacity of Jaggery making would be 200 tonnes during the season and capacity utilization of 60% is envisaged during first year and thereafter it is restricted to 75%.

## 9.2 Sales Revenue at 100%

(Rs. in lacs)

Product	Qty. MT	Selling Price Per MT	Value
Jaggery	200	13,000	26.00

## 9.3 Raw and Materials Required at 100%

(Rs. in lacs)

Product	Quantity MTA	Rate Rs. /MT	Value
Sugarcane	2,000	500	10.00
Soda Ash/Bhindi Juice	--	--	1.00
Gunny Bag Cloth and strings etc.	--	--	1.00
		<b>Total</b>	<b>12.00</b>

## 9.4 Utilities

The per season cost of utilities at 100% capacity level would be Rs.1.00 lac.

## 9.5 Interest:

Interest on term loan of Rs.7.50 lacs has been calculated @ 12% per annum assuming repayment in four years including a moratorium period of one year and on working capital from bank, it is computed @ 14% per annum.

## 9.6 Depreciation:

Depreciation on building has been worked out @ 10% p.a. The depreciation on plant and machinery as well as miscellaneous assets is assumed @ 20% per annum. The method applied is WDV.

## 10.0 PROJECTED PROFITABILITY

(Rs. in lacs)

No	Particulars	1st Year	2nd Year
<b>A</b>	<b>Installed Capacity</b>	<b>---200 Tonnes ---</b>	
	Capacity Utilisation	60%	75%
	Sales Realisation	15.60	19.50
<b>B</b>	<b>Cost of Production</b>		
	Raw and Packing Materials	7.20	9.00
	Utilities	0.60	0.75
	Salaries	1.60	1.90
	Stores and Spares	12.00	18.00
	Repairs and Maintenance	15.00	21.00
	Selling Expenses @ 12.5%	1.95	2.45
	Administrative Expenses	0.30	0.36
	<b>Total</b>	<b>11.62</b>	<b>14.85</b>
<b>C</b>	<b>Profit before Interest &amp; Depreciation</b>	<b>3.98</b>	<b>4.65</b>
	Interest on Term Loan	0.82	0.61
	Interest on Working Capital	0.10	0.14
	Depreciation	0.99	0.84
	Net Profit	2.07	3.06
	Income Tax @ 20%	0.41	0.61
	Profit after Tax	1.66	2.45
	Cash Accrual	2.65	3.29
	Repayment of Term Loan	--	2.25

## 11.0 BREAK-EVEN POINT ANALYSIS

(Rs. in lacs)

No.	Particulars	Amount	
<b>A</b>	<b>Sales</b>		<b>15.60</b>
<b>B</b>	<b>Variable Cost</b>		
	Raw and Packing Materials	7.20	
	Utilities (70%)	0.42	
	Salaries (70%)	1.12	
	Stores and Spares	0.12	
	Selling Expenses (70%)	1.38	
	Administrative Expenses (50%)	0.15	
	Interest on working capital	0.10	
	<b>Total</b>		<b>10.37</b>
<b>C</b>	<b>Contribution</b>		<b>5.23</b>
<b>D.</b>	<b>Fixed Cost</b>		<b>3.16</b>
<b>E.</b>	<b>Break Even Point (D÷C)</b>		<b>60%</b>

**10.0 [A] LEVERAGES**

**Financial leverage**

$$\begin{aligned} &= \text{EBIT/EBT} \\ &= 2.99 \div 2.07 \\ &= 1.44 \end{aligned}$$

**Operating Leverage**

$$\begin{aligned} &= \text{Contribution / EBT} \\ &= 5.23 \div 2.07 \\ &= 2.53 \end{aligned}$$

**Degree of Total Leverage**

$$\begin{aligned} &= \text{FL/OL} \\ &= 1.44 \div 2.53 \\ &= 0.57 \end{aligned}$$

**(B) Debt Service Coverage Ratio (DSCR)**

(Rs. in lacs)

Particulars	1st Yr	2nd Yr	3rd Yr	4th Yr
Cash Accruals	2.65	3.29	3.65	4.07
Interest on TL	0.82	0.61	0.35	0.19
<b>Total [A]</b>	<b>3.47</b>	<b>3.90</b>	<b>4.00</b>	<b>4.26</b>
Interest on TL	0.82	0.61	0.35	0.19
Repayment of TL	--	2.50	2.50	2.50
<b>Total [B]</b>	<b>0.82</b>	<b>3.11</b>	<b>2.85</b>	<b>2.69</b>
<b>DSCR [A] ÷ [B]</b>	<b>4.23</b>	<b>1.26</b>	<b>1.48</b>	<b>1.58</b>
<b>Average DSCR</b>	----- 2.14 -----			

**[C] Internal Rate of Return (IRR)**

Cost of the project is Rs. 10.77 lacs.

(Rs. in lacs)

<b>Year</b>	<b>Cash Accruals</b>	<b>16%</b>	<b>18%</b>	<b>20%</b>	<b>24%</b>
1	2.65	2.28	2.24	2.21	2.14
2	3.29	2.44	2.36	2.28	2.14
3	3.65	2.34	2.22	2.11	1.91
4	4.07	2.25	2.10	1.96	1.72
5	4.42	2.10	1.93	1.78	1.51
6	4.97	2.04	1.84	1.67	1.37
	<b>23.05</b>	<b>13.45</b>	<b>12.69</b>	<b>12.01</b>	<b>10.79</b>

The IRR is around 24%

**Some of the machinery suppliers are**

1. SP Engg. Works, PB No. 218, Kanpur (UP)
2. AMS Engg, Station Road, Patna (Bihar)
3. Siwan Foundry, Siwan (Bihar)
4. Sahyog Steel Fabrications, 28, Bhojrajpara, Gondal-360311. Tel No. 224075