JAM & JELLY

1.0 INTRODUCTION

Jam and jelly are made from fruits and they are being made since long in different forms. The methods of production were not very sophisticated but these products were made in conventional manner in many homes. Since availability of fruits is only seasonal, mankind had found out various ways to preserve them for consumption during off-season. Thus, jam & jelly were popular, albeit in different forms since long. With fruit processing techniques being modernised, we see them in present day refined version. But this note is about producing these products with conventional methods on a very small scale.

2.0 PRODUCTS

2.1 Applications

Jam & jelly are made from fruits, fruit pulps or extracts. Jam is boiled fruit pulp with sugar and preservatives and is thick. Jelly is also made by boiling but is clear, sparkling and transparent. These products are applied to some snacks or bread. They are also used in making certain desserts. They enjoy substantial shelf life and thus can be made available round the year. These products can be produced in many states of the country. The state of Assam is kept in mind while preparing this note as availability of fruits round the year is necessary.

2.2 Availability of technology, compliances and quality standards

CFTRI, Mysore, has successfully developed the technical know-how. Compliance with FPO and PFA Act is necessary. IS standard for these products is 5861:1970.

3.0 MARKET POTENTIAL

3.1 Demand and Supply

Jam & jelly are used in homes as well as restaurants and other eateries. These items are mainly consumed in urban areas. But these products are very popular in the North-East region of India and the consumption is increasing year after year. Presently, there are around 20 small units producing these products in the state and there is a wide gap between demand and supply which is met by the manufacturers from outside the region.

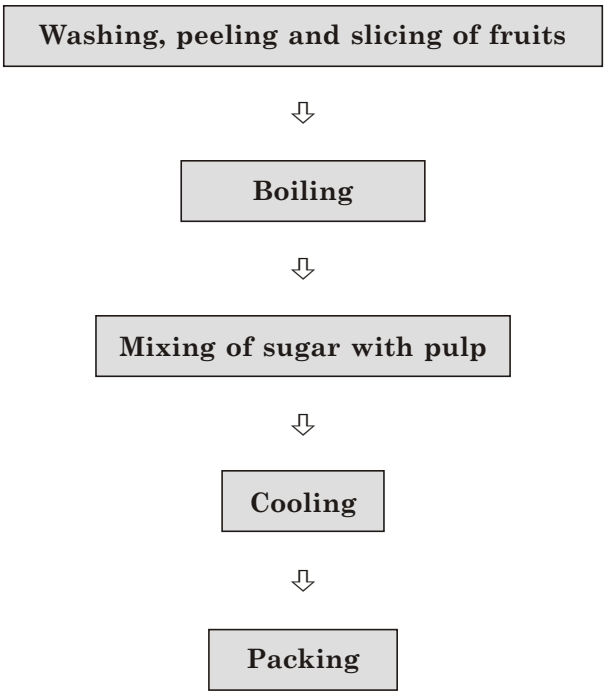
3.2 Marketing Strategy

There are many locally grown and popular fruits from which these products can be made but this aspect is still unexplored. Hence, few more small scale units can certainly be set up. The thrust has to be on the taste palatable to local demand and hence there is a very good scope for imagination. Product mix may have to be changed from time to time. Informal test marketing can also be undertaken to ascertain feedback and accordingly some modifications may have to be undertaken. The objective is to fill the gap in terms of consumer preference rather than offering a standard product.

4.0 MANUFACTURING PROCESS

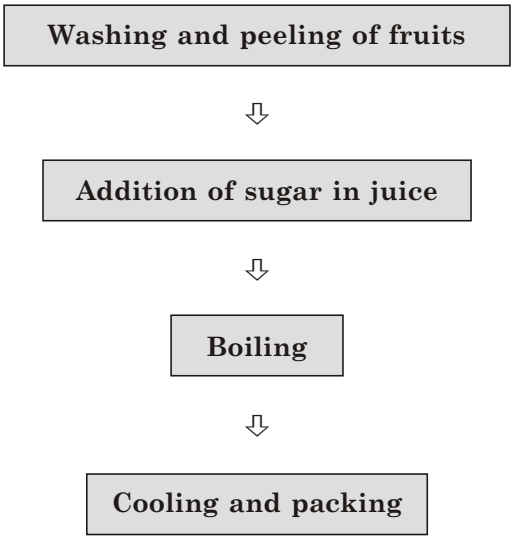
4.1 Jam

Fresh fruits are washed in water and after removing their skin, they are cut or sliced in small pieces. These pieces are boiled with water. Appropriate quantity of sugar is mixed with the pulp. When the temperature is around 60^{o} C; citric acid, colour, essence etc. are added. This mixture is then stirred for a while, cooled and then packed in bottles. The process flow chart is as under:



4.2 Jelly

Washed and peeled fruits are fed to the hopper of a juice extractor and the juice so obtained is filtered. Certain fruits like rosella or guava need to be boiled in water before extracting juice. Sugar is added to juice and then this mixture is boiled to convert it in jelly form and pectin, citric acid, colour etc. are added in the required quantity. Boiling is done till jelly-like formation is obtained. Packing is done on cooling. The process flow chart is as under:



5.0 CAPITAL INPUTS

5.1 Building

The unit is planned on a very moderate scale and hence one should try to obtain constructed area of around 70-75 sq.mtrs on rent. However, to ascertain the exact viability of the project, investment of Rs.1,20,000/- is estimated for own building.

5.2 Plant and Machinery

It is envisaged that the conventional production techniques will be employed and hence there is no need to install a modern plant. Recommended installed production capacity is 30 tonnes per year on 2 shift working and 300 working days for which following machines/equipments costing around Rs.1,25,000/- need to be installed:

Item	Qty.
Pulper -30 Kgs/Hr	1
Juice Extractors- 50 Ltrs.	2
Mixer/Grinders- 15 Kgs	2
Cap Sealing Machines	2
Slicers	4
Bottle Washing Machine	1

5.3 Miscellaneous Assets

There will be requirement of some other assets like weighing scale, glassware, working tables, canteen burners, stainless steel utensils, hand-gloves, cutters and graters, storage racks etc. for which a provision of Rs. 50,000/- is adequate. Testing equipments like jell meter, refractometer etc. would cost an additional amount of Rs.15,000/-.

5.4 Utilities

Power requirement would be 5 HP whereas daily requirement of water will be around 1,500 ltrs. Around 300 cylinders of cooking gas shall be required at 100% activity level per year.

5.5 Raw Material

The major raw materials required will be fresh fruits. Pineapple, orange and jackfruit are known fruits but there are many other fruits grown in this region like carambola, rozelle, narabogori, guava and so on. Since annual requirement of each fruit will not be more than 6-8 tonnes, no difficulty is envisaged on this front. Other materials like sugar, pectin, citric acid, food grade colours, flavours etc. are available locally without any difficulty.

6.0 MANPOWER REQUIREMENTS

Particulars	Nos.	Monthly Salary (Rs.)	Total Monthly Salary (Rs.)
Supervisor	2	1,800	3,600
Semi-skilled Workers	2	1,500	3,000
Helpers	4	1,000	4,000
Technician	1	2,500	2,500
Salesman	1	2,000	2,000
		Total	**15,100**

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

8.0 DETAILS OF THE PROPOSED PROJECT

8.1 Building

A built-up area of 70-75 sq.mtrs. would accommodate equipments leaving adequate space for storage, packing etc. The construction cost is assumed to be Rs. 1,20,000/-.

8.2 Plant and Machinery

As explained earlier, the total cost under this head is estimated to be Rs. 1,25,000/-.

8.3 Miscellaneous Assets

Miscellaneous assets would cost around Rs.50,000/- whereas a provision of Rs.15,000/- is made for testing equipments. Thus, an expenditure of Rs.65,000/- is assumed.

8.4 Preliminary & Pre-operative Expenses

A provision of Rs. 40,000 is made which can take care of expenses like establishment charges, interest during implementation, trial runs, etc.

8.5 Working Capital Requirement

Against annual capacity of 30 tonnes, the plant is expected to be operated at 60% in the first year. To achieve this capacity utilisation, the working capital needs would be as under:

(Rs. in lacs)

Particulars	Period	Margin	Total	Bank	Promoters
Stock of Packing and RMs	½ Month	30%	0.40	0.28	0.12
Stock of Finished Goods	1 Month	25%	1.00	0.75	0.25
Receivables	1 Month	25%	1.50	1.10	0.40
Working Expenses	1 Month	100%	0.25	--	0.25
		Total	**3.15**	**2.13**	**1.02**

8.6 Cost of the Project and Means of Financing

(Rs. in lacs)

Item	Amount
Building	1.20
Machinery	1.25
Miscellaneous Assets	0.65
P&P Expenses	0.40
Contingencies @ 10% on Building and P&M	0.25
Working Capital Margin	1.02
Total	**4.77**
Means of Finance	
Promoters' Contribution	1.37
Loan from Bank/FI	3.40
Total	**4.77**
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 installed production capacity at 100% shall be 30 tons of jam & jelly considering 2 shift working every day and 300 working days every year. The plant is envisaged to be operated at 60% in the first year and 75% thereafter.

9.2 Sales Revenue at 100%

As explained earlier, jam & jelly from different fruits including some locally grown and popular fruits shall be prepared and hence it is not feasible to arrive at the exact sales mix. This, in turn, means that the selling price has to be worked out on an average basis. Therefore, the average selling price is assumed to be Rs.100/per kg. or Rs.1.00 lac per ton. In other words, annual turnover at 100% could be Rs.30.00 lacs.

9.3 Raw Materials Required at 100%

It is suggested that jam & jelly should be made from some local fruits as this may be very well accepted by the natives. Hence, apart from fruits like pineapple, orange and guava some other fruits shall also be required e.g. carambola, rozelle, narabogori, jackfruit etc. Fruits are grown during respective seasons and their prices vary depending upon availability. Hence, average price per ton is taken @ Rs.8000/-. Juice and pulp contents also vary from fruit to fruit. Hence, it is assumed to be 25%. Other materials like sugar, essence, pectin, citric acid shall be available locally. Packing materials like food grade plastic/glass bottles, polythene bags, corrugated boxes etc. shall be procured locally. Thus, at 100% activity level, the raw materials requirement shall be as under:

(Rs. in lacs)

Product	Qty. (Tonnes)	Rate (Rs./Ton)	Value
Fruits	120	8,000	9.60
Sugar	15	17,000	2.55
Pectin, Citric Acid etc.	--	--	0.50
Packing Material	--	--	3.00
		Total	**15.65**

9.4 Utilities

The total expenditure on power and water at 100% shall be Rs. 24,000/- per year whereas about 300 LPG cylinders would cost Rs. 90,000/-. Thus, total would be Rs. 1,14,000/-.

9.5 Selling Expenses

In view of competition from existing products, a provision of 17.5% of sales value is made towards these expenses. They include selling commission, transportation, quick market survey on regular basis, etc.

9.6 Interest

Interest on term loan of Rs.3.10 lacs is taken at 12% per annum assuming repayment in 4 years including a moratorium period of 1 year. Interest on working capital is computed @ 14% per annum.

9.7 Depreciation

It is calculated on WDV basis and rates assumed care 10% on building and 20% on equipments and miscellaneous assets.

10.0 PROJECTED PROFITABILITY

(Rs. in lacs)

No.	Particulars	1st Year	2nd Year
A	**Installed Capacity**	**----- 30 Tonnes ------**	
	Capacity Utilisation	60%	75%
	Sales Realisation	18.00	22.50
B	**Cost of Production**		
	Raw and Packing Materials	9.40	11.75
	Utilities	0.54	0.68
	Salaries	1.81	2.10
	Repairs and Maintenance	0.15	0.21
	Selling and Distribution Exps. (17.5%)	3.15	3.93
	Administrative Expenses	0.24	0.33
	Total	**15.29**	**19.00**
C	**Profit Before Interest & Depreciation**	**2.71**	**3.50**
	Interest on Term Loan	0.37	0.25
	Interest on Working Capital	0.30	0.37
	Depreciation	0.50	0.37
	Net Profit	1.54	2.51
	Income-tax @ 20%	0.34	0.50
	Profit After Tax	1.20	2.01
	Cash Accruals	1.70	2.38
	Repayment of Term Loan	--	1.00

11.0 BREAK-EVEN ANALYSIS

(Rs. in lacs)

No	Particulars		Amount
[A]	**Sales**		**18.00**
[B]	**Variable Costs**		
	Raw and Packing Materials	9.40	
	Utilities (70%)	0.38	
	Salaries (75%)	1.36	
	Selling and Distribution Expenses (80%)	2.52	
	Admn Expenses (50%)	0.12	
	Interest on WC	0.30	**14.08**
[C]	**Contribution [A] - [B]**		**3.92**
[D]	**Fixed Cost**		**2.46**
[E]	**Break-Even Point [D ÷ C]**		**62%**

12.0 [A] LEVERAGES

Financial Leverage

= EBIT/EBT

= 2.21 ÷ 1.54

= 1.43

Operating Leverage

= Contribution/EBT

= 3.92 ÷ 1.54

= 2.55

Degree of Total Leverage

= FL/OL

= 1.43 ÷ 2.55

= 0.56

[B] Debt Service Coverage Ratio (DSCR)

(Rs. in lacs)

Particulars	1st Yr	2nd Yr	3rd Yr	4th Yr
Cash Accruals	1.70	2.38	2.51	2.64
Interest on TL	0.37	0.25	0.17	0.08
Total [A]	**2.07**	**2.63**	**2.68**	**2.72**
Interest on TL	0.37	0.25	0.17	0.08
Repayment of TL	--	1.10	1.10	1.20
Total [B]	**0.37**	**1.35**	**1.27**	**1.28**
DSCR [A] ÷ [B]	**5.59**	**1.95**	**2.11**	**2.12**
Average DSCR	**---------- 2.94 ----------**			

[C] Internal Rate of Return (IRR)

Cost of the project is Rs. 4.77 lacs.

(Rs. in lacs)

Year	Cash Accruals	24%	28%	32%
1	1.70	1.37	1.33	1.29
2	2.38	1.55	1.45	1.37
3	2.51	1.32	1.20	1.09
4	2.64	1.12	0.98	0.87
	9.23	**5.36**	**4.96**	**4.62**

The IRR is around 30%.

Some of the machinery suppliers are

1. M/s. Industrial Equipments, Guwahati
2. M/s. Archana Machinery Stores ,Guwahati
3. Punjab Engg Works, Ramkrishna Samadhi Road, Kolkata
4. Engineers' (Overseas) Corpn Pvt Ltd, Raja Santosh Road, Kolkata