

JACKFRUIT PRODUCTS



1.0 INTRODUCTION

Jackfruit is a typical Indian fruit mainly grown in West Bengal, Bihar, Assam and the west coast. The project can be set up in any of these States. Fully ripe jackfruit is sweet and has exotic flavour. The bulbs (edible flakes) contain 7.5% sugar on dry weight basis and a fair amount of carotene which is Vitamin-A. Many down the line products from jackfruit are contemplated. Apart from better utilisation of perishable fruit this would also result in considerable value addition.

2.0 PRODUCTS

2.1 Applications

Many products could be made from ripe jackfruit like nectar, jam, pickle, chips and canning. Jackfruit is grown in only certain parts of India and hence its popularity is limited to the growing regions only. Assam, especially Darrang district of the state, grows substantial quantities of this fruit and reportedly there are not much processing units in the state.

2.2 Availability of know-how and Compliances

CFTRI, Mysore, has successfully developed the technical know-how. Compliance with PFA Act and FPO is required.

3.0 MARKET POTENTIAL

3.1 Demand and Supply

Jackfruit is sweet in taste and also contains Vitamin-A. Like any other fruit, it is perishable in nature. It is grown in very limited parts of India and hence is not much popular in other parts. It is heavy and bulky fruit and hence transportation is not very easy and is costly as

well. Therefore, its down the stream products with longer shelf-life can be easily transported and shall also have value-addition. Products like canned pieces, nectar, jam, pickle and chips are recommended.

3.2 Marketing Strategy

These products have market round the year and are popular in North-Eastern states. Products shall have to be sold with the help of retailers at many locations like cities/towns, bus-stands, railway stations, school/college canteens, picnic spots etc. There is a distinct possibility of marketing these products in other states of India as well but for a smaller project like this, it is not recommended.

4.0 MANUFACTURING PROCESS

Jackfruit is heavy and bulky and actual recovery of bulbs or edible portion varies from 20% to 25%. After cutting the fruit in several pieces, the bulbs are removed manually. As the fruit contains highly sticky latex, small quantity of vegetable oil is applied on hands and then seeds are removed from bulbs. In case of canned jackfruit, these bulbs are canned with a small quantity of citric acid as the pH value of this fruit is very high. While making nectar, the bulbs are passed through pulping/fruit mill and around 10% hot water is mixed. Nectar is prepared from this pulp. In case of chips, raw or unripe jackfruits are used. After removing bulbs as stated earlier, suitable smaller sizes are cut and they are fried in edible oil. These fried pieces are salted and then packed. In case of pickle also unripe jackfruits are used. After removing bulbs and seeds, small pieces are made and they are mixed with oil, salt and spices before packing. Jam is prepared from the pulp of ripe fruits with additives.

5.0 CAPITAL INPUTS

5.1 Land and Building

Land of around 300 sq.mtrs. with built up area of 120 sq.mtrs. shall be adequate. The main production hall would occupy around 60 sq.mtrs. whereas balance area of around 60 sq.mtrs. can be suitably divided into go down, packing room and factory office. Cost of land could be about Rs. 90,000/- whereas that of civil work it could be Rs. 3.00 lacs.

5.2 Plant and Machinery

It is suggested to have annual production capacity of 100 tons. Jackfruits are available for around 7-8 months and hence yearly working is assumed to be 250 days with 2 shifts per day.

To install this production capacity, following machinery shall be required:

Item	Qty.	Price (Rs.)
100 Ltrs. capacity SS make steam jacketed kettle Straight feeding exhaust box with 2 HP motor,	1	20,000
starter and gear box	1	22,000
Sterilisation tanks	2	5,000
Semi-automatic can Sealer	1	35,000
Can body reformer with electric motor and starter	1	15,000
Can body flagger with electric motor and starter	1	9,000
Fruit Mill with 2 HP motor with blades and sieves suitable for jackfruit	1	19,000
PP Cap sealing machine	1	7,000
Plastic bag sealing machines	2	1,500
Frying pans	2	4,500
Storage containers of food grade plastic of 50 kgs. capacity for pickle	100	20,000
Storage containers of food grade plastic of 30 kgs. capacity for pulp	100	15,000
SS knives, utensils etc.	--	5,000
Testing Equipments	-	10,000
Weighing Scales	--	6,000
200 Kgs. Capacity Mini-boiler	1	50,000
	Total	2,44,000

5.3 Miscellaneous Assets

Other items like office furniture, working tables with aluminium tops in the factory, exhaust fans, storage racks and bins etc. are likely to cost Rs. 40,000/-.

5.4 Utilities

Total power requirement shall be 15 HP and water requirement for production process, potable and sanitation purposes shall be around 1500 ltrs every day. Furnace oil or coke or wood will be required for boiler. Annual expenses on utilities at 100% activity level would be Rs. 80,000/-.

5.5 Raw Material

Jackfruit is grown in large quantities in the state of Assam and the total annual production is estimated to be in the vicinity of 1, 75,000 tonnes. As against this, the annual requirement of the unit even at 100% capacity utilisation will not be more than 500 tonnes. Actual recovery of bulbs or edible portion is in the range of 20% to 25%. Hence, to be on safer side and to present a realistic picture, recovery or yield is considered to be 20%. However, transportation of jackfruit is expensive and hence the factory should be located in the jackfruit growing area. Other items like sugar, edible oil, salt, citric acid, spices etc. are

required in very small quantity and their availability would not be a problem. Packing materials like plastic/glass bottles, tins, caps, labels, printed polythene bags etc. shall be required and since the total quantities shall not be much, it is necessary to make proper supply arrangements.

6.0 MANPOWER REQUIREMENTS

Particulars	Nos.	Monthly Salary (Rs.)	Total Monthly Salary (Rs.)
Skilled Workers	2	1,800	3,600
Semi-skilled Workers	2	1,350	2,700
Unskilled Workers	4	1,000	4,000
Salesman	1	2,000	2,000
		Total	12,300

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

Particulars	Area (Sq.Mtrs)	Cost (Rs.)
Land	300	90,000
Building	120	3,00,000
	Total	3,90,000

8.2 Plant and Machinery

As elaborated in detail earlier, the total cost under this head comes to Rs. 2.44 lacs.

8.3 Miscellaneous Assets

A provision of Rs.40, 000/- is adequate to install other support assets as explained earlier.

8.4 Preliminary & Pre-operative Expenses

Any industrial venture entails certain pre-production expenses like registration and establishment expenses, trial run expenditure, interest during implementation and so on. A provision of Rs. 45,000/- would take care of such expenses.

8.5 Working Capital Requirement

The project is expected to operate at 60% capacity in the first year. To achieve this target it would need adequate amount of working capital as worked out hereunder:

(Rs. in lacs)

Particulars	Period	Margin	Total	Bank	Promoters
Stock of Packing Materials	1 Month	30%	0.30	0.21	0.09
Stock of Finished Goods	½ Month	25%	0.40	0.30	0.10
Receivables	1 Month	25%	1.50	1.15	0.35
Working Expenses	1 Month	100%	0.25	--	0.25
		Total	2.45	1.66	0.79

8.6 Cost of the Project and Means of Financing

(Rs. in lacs)

Item	Amount
Land and Building	3.90
Plant and Machinery	2.44
Miscellaneous Assets	0.40
P&P Expenses	0.45
Contingencies @ 10% on Land and Building and Plant & Machinery	0.63
Working Capital Margin	0.79
Total	8.61
Means of Finance	
Promoters' Contribution	2.66
Term Loan from Bank/FI	5.95
Total	8.61
Debt Equity Ratio	2.24 : 1
Promoters' Contribution	31%

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 shall be 100 tonnes per year but capacity utilisation in the first year is restricted to 60% whereas second year onwards, it is assumed to be 75%.

9.2 Sales Revenue at 100%

(Rs. in lacs)

Product	Qty. (Tonnes)	Selling Price (Rs/Ton)	Sales
Canned Jackfruit	25	30,000	7.50
Jackfruit Jam	25	30,000	7.50
Jackfruit Nectar	20	26,000	5.20
Jackfruit Pickle	20	28,000	5.60
Jackfruit Chips	10	50,000	5.00
		Total	30.80

9.3 Raw Materials Required at 100%

(Rs. in lacs)

Product	Qty. (Tonnes)	Selling Price (Rs/Ton)	Sales
Jackfruit (Ripe)	350	1,200	4.20
Jackfruit (Unripe)	150	1,000	1.50
Sugar	-	-	2.88
Citric acid, pectin, colours, essence etc.	--	--	0.50
Salt, Vinegar, spices	--	--	0.40
Packing Materials Plastic/Glass bottles & Caps.	--	--	1.50
Aluminium Cans	--	--	3.25
Labels, polythene bags, new/used cartons, etc.	--	--	1.25
		Total	15.48

9.4 Utilities

The total annual cost at 100% utilisation is estimated to be Rs. 80,000/- as explained earlier.

9.5 Selling Expenses

The products shall have to be sold through retailers for whom a provision of sales commission @ 10% is made. There will be some other expenses like transportation, publicity in local media etc. for which a provision of 5% is made.

9.6 Interest

Interest on term loan of Rs. 5.95 lacs is worked out @ 12% per annum considering repayment in 5 years including a moratorium period of 1 year. Interest on bank borrowing for working capital is computed @ 14% per annum.

9.7 Depreciation

The rates assumed are 10% for building and 20% for machinery and miscellaneous assets and the method adopted is WDV.

10.0 PROJECTED PROFITABILITY

(Rs. in lacs)

No.	Particulars	1st Year	2nd Year
A	Installed Capacity	--- 100 Tonnes ---	
	Capacity Utilisation	60%	75%
	Sales Realisation	18.48	23.10
B	Cost of Production		
	Raw Materials	5.69	7.11
	Packing Materials	3.60	4.50
	Utilities	0.48	0.60
	Salaries	1.48	1.70
	Stores & Spares	0.15	0.21
	Repairs & Maintenance	0.24	0.36
	Selling and Distribution @ 15%	2.79	3.47
	Administrative Expenses	0.30	0.42
	Total	14.73	18.37
C	Profit before Interest & Depreciation	3.75	4.73
	Interest on Term Loan	0.66	0.49
	Interest on Working Capital	0.23	0.29
	Depreciation	0.87	0.72
	Net Profit	1.99	3.23
	Income-tax @ 20%	0.40	0.63
	Profit after Tax	1.59	2.60
	Cash Accruals	2.46	3.32
	Repayment of Term Loan	--	1.40

11.0 BREAK-EVEN ANALYSIS

(Rs. in lacs)

No	Particulars	Amount	
[A]	Sales		18.48
[B]	Variable Costs		
	Raw Materials	5.69	
	Packing Materials	3.60	
	Utilities (70%)	0.35	
	Salaries (70%)	1.05	
	Stores & Spares	0.15	
	Selling Expenses (75%)	2.08	
	Admn Expenses (50%)	0.15	
	Interest on Working Capital	0.23	13.30
[C]	Contribution [A] - [B]		5.18
[D]	Fixed Cost		3.19
[E]	Break-Even Point [D ÷ C]		62%

12.0 [A] LEVERAGES**Financial Leverage**

$$= \text{EBIT/EBT}$$

$$= 2.88 \div 1.99$$

$$= 1.44$$

Operating Leverage

$$= \text{Contribution/EBT}$$

$$= 5.18 \div 1.99$$

$$= 2.60$$

Degree of Total Leverage

$$= \text{FL/OL}$$

$$= 1.44 \div 2.60$$

$$= 0.55$$

[B] Debt Service Coverage Ratio (DSCR)

(Rs. in lacs)

Particulars	1st Yr	2nd Yr	3rd Yr	4th Yr	5th Yr
Cash Accruals	2.46	3.32	3.55	3.87	4.22
Interest on TL	0.66	0.49	0.37	0.20	0.08
Total [A]	3.12	3.81	3.92	4.07	4.30
Interest on TL	0.66	0.49	0.37	0.20	0.08
Repayment of TL	--	1.50	1.50	1.50	1.45
Total [B]	0.66	1.99	1.87	1.70	1.53
DSCR [A] ÷ [B]	4.73	1.91	2.09	2.39	2.81
Average DSCR	----- 2.78 -----				

[C] Internal Rate of Return (IRR)

Cost of the project is Rs. 8.61 lacs.

(Rs. in lacs)

Year	Cash Accruals	24%	28%	32%
1	2.46	1.98	1.92	1.86
2	3.32	2.16	2.03	1.91
3	3.55	1.86	1.69	1.54
4	3.87	1.64	1.44	1.27
5	4.22	1.44	1.23	1.06
	17.42	9.08	8.31	7.64

The IRR is around 26%.

These machines are available from:

1. Industrial Equipments, Guwahati
2. Archana Machinery Stores, Guwahati
3. Auric Techno Services Pvt. Ltd., C-101, Shreenath Hermitage, Baner Rd., Pune-411008. Tel No. 25898072/91113 Fax No. 25899113
4. PRS Technologies Pvt. Ltd. D-26, NDSE Part II, New Delhi-110049. Tel No. 26252176/77, Fax : 2540789