

# GREEN PEAS DEHYDRATION



## 1.0 INTRODUCTION

Green peas are available for around 5 months during winter season only. They are used for making vegetables, as additives in certain vegetables and for making several snack preparations. Hence, if they are made available even during off-season, there is a good market for them. There are some established brands in Maharashtra like Mafco but even then there is a fairly large market for dehydrated peas in urban and semi-urban areas if the prices are reasonable. A small scale unit with lower overheads can offer competitive prices. Marketing would play a critical role. Likewise, the promoters should have adequate financial resources as the finished good stock of around 5-6 months shall have to be stored. The preferred locations for this product are Maharashtra, HP, UP, Bihar etc.

## 2.0 PRODUCT

### 2.1 Applications

Like any other green vegetable, green peas are available for around 4-5 months only. In view of their demand round the year, they can be preserved with the help of dehydration process and sold during off-season. It is also possible to produce powder which has got good market prospects. But this note considers only dehydration of green peas.

### 2.2 Availability of technical know-how, Compliances and quality standards

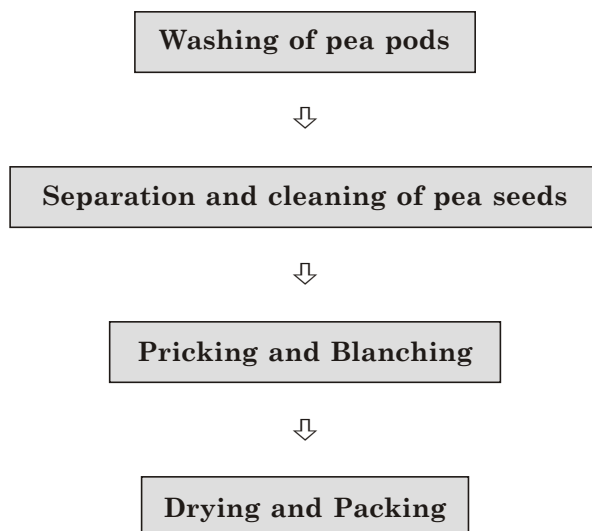
CFTRI, Mysore, has successfully developed the technical know-how. Compliance with FPO and PFA Act is mandatory. BIS has standardised quality parameters vide IS 4626:1968 and it is advisable to adhere to it.

### 3.0 MARKET POTENTIAL

Indians generally prefer green and fresh vegetables but they are available only during seasons. Some their shelf life is not more than 3-4 days. But dehydration technique preserves them for few months and the original taste, flavour and colour is also retained. Green peas are very popular and they are used along with other vegetables in many vegetarian and continental dishes. Many fast food and snack items also include green peas. Thus apart from household demand, there is a continuous demand from restaurants, dhabas, caterers and canteens. Price is the main consideration as these eateries can not afford high prices. Brands like Mafco or Amul are in the market but their products are costly. If a small scale unit can offer competitive price of around Rs.40/- per kg. then there is a large untapped market segment. It is also advisable to enter into a long term supply contract with some bulk consumers at least during first 2-3 years to penetrate the market with retailing of around 25% to 30% of production and gradually retailing can be increased.

### 4.0 MANUFACTURING PROCESS

This note does not envisage very high capacity and totally mechanised plant as it would call for investment in excess of Rs. 75.00 lacs. Instead, a moderate capacity semi-automatic plant is suggested. Fresh, sound and green pea pods are thoroughly washed in water and then pea seeds are separated and cleaned with the help of pea podder. Then they are pricked as pricking facilitates quick and uniform drying of peas. Then they are blanched and sulphited to retain colour, taste and texture in the final product. Blanched peas are then dried in a drier wherein moisture is reduced to 7-8%. Drying time is around 3 hours. Finally dried peas are graded and packed. On an average, the process and weight loss is 75%. The process flow chart is as under:



### 5.0 CAPITAL INPUTS

#### 5.1 Land and Building

Plot of around 300 sq.mtrs. with built-up area of 150 sq.mtrs. would be adequate. Land may cost Rs.1.00 lac whereas cost of civil work will be Rs.3.75 lacs. Production area would occupy around 80-85 sq.mtrs. whereas the balance area can be utilised for storage and packing.

## 5.2 Machinery

The plant is expected to operate for around six months due to seasonal availability of green pea pods. The processing capacity of the plant is assumed to be 30 tonnes per month on 2 shift working and working of 25 days every month or 150 days during season of 6 months. It is possible to dehydrate other vegetables during off-season but this note considers only green peas. This would need the following machines:

Item	Qty.	Price (Rs.)
Pea Podder- 50 Kgs/Hr	1	75,000
Peas Pricking Machine-50 Kgs/Hr	1	80,000
Blanching Tank with Thermostat Control	1	1,00,000
Fluidized Bed Dryer complete with all attachments and accessories- 48 trays	1	1,75,000
Hot Water Boiler with attachments- 100 Kgs	1	60,000
Washing Tanks	2	40,000
Automatic Form, Fill and Seal Machine complete with all accessories	1	1,00,000
Weighing-scales, Testing Equipments, etc.	--	35,000
	<b>Total</b>	<b>6,65,000</b>

## 5.3 Miscellaneous Assets

Some other assets like SS utensils, storage racks, furniture and fixtures, exhaust fans etc. shall be required for which a provision of Rs.50, 000/- is made.

## 5.4 Utilities

Power requirement shall be 40 HP during the season whereas water requirement during same period would be 1000-1200 ltrs. every day.

## 5.5 Raw and Packing Materials

The most critical raw material shall be fresh, matured and green pea pods. Even though, the monthly requirement during the season will not be more than 30 tonnes, proper arrangements must be made especially during the beginning and fag-end of the season. Prices of green pea pods also fluctuate during the beginning, peak and end of the season. Hence, average price is taken @ Rs.5, 000/- per ton. Printed rolls of appropriate food grade plastic shall be required for inner packing and corrugated boxes, box strapping, labels etc. for the outer packing.

## 6.0 MANPOWER REQUIREMENTS

Particulars	Nos.	Monthly Salary (Rs.)	Total Monthly Salary (Rs.)
Machine Operators	2	2,500	5,000
Skilled Workers	2	2,000	4,000
Semi-skilled Workers	2	1,650	3,300
Helpers	4	1,250	5,000
Salesman	1	2,500	2,500
		<b>Total</b>	<b>19,800</b>

Salesman and couple of helpers may be employed round the year and others only for 6 months.

## 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	1,00,000
Building	150	3,75,000
	<b>Total</b>	<b>4,75,000</b>

### 8.2 Machinery

The total cost of machinery is estimated to be Rs. 6.65 lacs as discussed earlier.

### 8.3 Miscellaneous Assets

A provision of Rs.50, 000/- is adequate under this head as narrated earlier.

### 8.4 Preliminary & Pre-operative Expenses

There will be many pre-production expenses towards market survey, registration, establishment and administrative charges, interest during implementation, trial runs, etc. for which a provision of Rs.80,000/- is made.

## 8.5 Working Capital Requirements

Capacity utilisation in the first year is expected to be 65% for which following working funds will be required.

(Rs. in lacs)

Particulars	Period	Margin	Total	Bank	Promoters
Stock of Packing Materials	1 Month	30%	0.20	0.16	0.04
Stock of Finished Goods	5 Months	40%	4.50	2.70	1.80
Receivables	½ Month	25%	0.70	0.54	0.16
Other Expenses	1 Month	100%	0.40	--	0.40
		<b>Total</b>	<b>5.80</b>	<b>3.40</b>	<b>2.40</b>

## 8.6 Cost of the Project & Means of Financing

(Rs. in lacs)

Item	Amount
Land and Building	4.75
Machinery	6.65
Miscellaneous Assets	0.50
P&P Expenses	0.80
Contingencies @ 10% on Land and Building & Plant & Machinery	1.15
Working Capital Margin	2.40
<b>Total</b>	<b>16.25</b>
<b>Means of Finance</b>	
Promoters' Contribution	4.85
Term Loan from Bank/FI	11.40
<b>Total</b>	<b>16.25</b>
Debt Equity Ratio	2.35 : 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 & Build-up

As against the rated capacity of 30 tonnes per month, the plant is expected to operate at 65% in the first year and 80% thereafter.

### 9.2 Sales Revenue at 100%

Considering 25% recovery of dehydrated peas, yearly turnover would be 45 tonnes. Thus, turnover at 100% activity level would be Rs.24.75 lacs considering selling price of Rs.55,000/Ton.

### **9.3 Raw and Packing Materials Required at 100%**

Green peas pods of 30 tonnes per month or 180 tonnes during season would cost Rs.9.00 lacs assuming average price of Rs.5, 000/- per ton as explained earlier. Aluminium silicate and bleaching powder worth Rs.60, 000/- shall be required whereas cost of packing materials would be Rs.3, 000/- per ton or Rs. 2.16 lacs for 72 tonnes of finished goods. Thus, the raw and packing material would cost Rs. 11.76 lacs at 100% capacity utilisation.

### **9.4 Utilities**

Total expenses during the season at 100% would be Rs.60, 000/-.

### **9.5 Selling Expenses**

Initially, the concentration would be on direct sale to bulk buyers with around 25% retailing. Accordingly a lump sum provision has been made.

### **9.6 Interest**

Interest on term loan of Rs.11.40 lacs is calculated @ 12% per annum assuming repayment in 5 years including a moratorium period of 1 year whereas on working capital loan from bank, it is taken at 14% per annum.

### **9.7 Depreciation**

It is computed on WDV basis @ 10% on building and 15% on machinery and miscellaneous assets.

## 10.0 PROJECTED PROFITABILITY

(Rs. in lacs)

No.	Particulars	1st Year	2nd Year
<b>A</b>	<b>Installed Capacity</b>	--- 180 Tonnes ---	
	Capacity Utilisation	65%	80%
	Sales Realisation	16.08	19.80
<b>B</b>	<b>Cost of Production</b>		
	Raw and Packing Materials	7.65	9.40
	Utilities	0.39	0.48
	Salaries	1.50	1.70
	Stores and Spares	0.30	0.36
	Repairs & Maintenance	0.36	0.42
	Selling Expenses	0.50	0.65
	Administrative Expenses	0.48	0.60
	<b>Total</b>	<b>11.50</b>	<b>13.96</b>
<b>C</b>	<b>Profit before Interest &amp; Depreciation</b>	<b>4.90</b>	<b>6.19</b>
	Interest on Term Loan	1.26	1.02
	Interest on Working Capital	0.48	0.60
	Depreciation	1.45	1.25
	Profit before Tax	1.71	3.32
	Income-tax @ 20%	0.34	0.66
	Profit after Tax	1.37	2.66
	Cash Accruals	2.82	3.91
	Repayment of Term Loan	--	2.65

## 11.0 BREAK-EVEN ANALYSIS

(Rs. in lacs)

No	Particulars	Amount	
[A]	Sales		19.80
[B]	Variable Costs		
	Raw and Packing Materials	9.40	
	Utilities (70%)	0.35	
	Salaries (70%)	1.19	
	Stores & Spares	0.36	
	Selling Expenses (75%)	0.46	
	Admn. Expenses (50%)	0.30	
	Interest on WC	0.60	12.66
[C]	Contribution [A] - [B]		7.14
[D]	Fixed Cost		4.17
[E]	Break-Even Point [D] ÷ [C]		59%

## 12.0 [A] LEVERAGES

### Financial Leverage

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

$$= 3.45 \div 1.71$$

$$= 2.01$$

### Operating Leverage

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

$$= 5.78 \div 1.71$$

$$= 3.38$$

### Degree of Total Leverage

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

$$= 2.01 \div 3.38$$

$$= 0.59$$

## [B] Debt Service Coverage Ratio (DSCR)

(Rs. in lacs)

Particulars	1st Yr	2nd Yr	3rd Yr	4th Yr	5th Yr
Cash Accruals	2.82	3.91	4.28	4.83	5.33
Interest on TL	1.26	1.02	0.70	0.38	0.14
<b>Total [A]</b>	<b>4.08</b>	<b>4.93</b>	<b>4.98</b>	<b>5.21</b>	<b>5.47</b>
Interest on TL	1.26	1.02	0.70	0.38	0.14
Repayment of TL	--	2.85	2.85	2.85	2.85
<b>Total [B]</b>	<b>1.26</b>	<b>3.87</b>	<b>3.55</b>	<b>3.23</b>	<b>2.99</b>
<b>DSCR [A] ÷ [B]</b>	<b>3.24</b>	<b>1.28</b>	<b>1.40</b>	<b>1.61</b>	<b>1.83</b>
<b>Average DSCR</b>	----- 1.87 -----				



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

Cost of the project Rs. 16.25 lacs.

(Rs. in lacs)

<b>Year</b>	<b>Cash Accruals</b>	<b>16%</b>	<b>18%</b>	<b>20%</b>
1	2.82	2.43	2.39	2.35
2	3.91	2.91	2.81	2.71
3	4.28	2.74	2.61	2.48
4	4.83	2.67	2.49	2.33
5	5.33	2.54	2.33	2.14
6	5.76	2.36	2.13	1.93
7	6.15	2.18	1.93	1.72
	<b>33.08</b>	<b>17.83</b>	<b>16.69</b>	<b>15.66</b>

The IRR is around 19%.

**Some of the machinery suppliers are**

1. International Food Machinery Corpn, Opp. Deep Bhavan, Pandit Nehru Marg,  
Jamnagar- 361008
2. Raylon Metal Works, PO BOX NO. 17426, Andheri (E), Mumbai-400069
3. Auric Techno Services Pvt. Ltd. C-101, Shreenath Hermitage, Baner Rd., Pune-411008.  
Tel No. : 25898072/991113 Fax No. 25899113
4. Flavourite Foods and Services Pvt. Ltd., 208, Manas Bhavan, 11 RNT Marg, Indore-542008.  
Tel No. : 2527644