



## **Detailed Project Report**

### **STRAWBERRY CRUSH MANUFACTURING UNIT**

**Under the Formalization of Micro Food Processing Enterprises Scheme**

**(Ministry of Food Processing Industries, Government of India)**



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### Project at a Glance

1	Name of the Project	Strawberry Crush
2	Name of the entrepreneur/FPO/SHG/Cooperative	
3	Nature of proposed project	Proprietorship/Company/ Partnership
4	Registered office	
5	Project site/location	
6	Names of Partner (if partnership)	
7	No of share holders (if company/FPC)	
8	Technical advisor	
9	Marketing advisor/partners	
10	Proposed project capacity	150 MT/annum (70, 80 & 90% capacity utilization in the 2nd, 3rd and 4th years' onwards respectively
11	Raw materials	Strawberry Fruit
12	Major product outputs	Strawberry Crush
13	Total project cost (Lakhs)	23.54
	Land development, building & civil construction	4.44
	Machinery and equipment	13.85
	Utilities (Power & water facilities)	2.2
	Miscellaneous fixed assets	0.9
	Pre-operative expenses	0.90
	Contingencies	1.00
	Working capital margin	5.57
14	Working capital Management (In Lakhs)	
	Second Year	16.72

	Third Year	19.11
	Fourth Year	24.57
15	Means of Finance	
	Subsidy grant by MoFPI (max 10 lakhs)	9.4182
	Promoter's contribution (min 20%)	5.708
	Term loan (45%)	13.4138
16	Debt-equity ratio	2.35 : 1
17	Profit after Depreciation, Interest & Tax	
	2nd year	72.31
	3rd year	84.64
	4th year	96.95
18	Average DSCR	19.14
	Benefit Cost Ratio	2.474166133
	Term Loan Payment	7 Years with 1 year grace period
	Pay Back Period for investment	2 Years

## 2. General Overview and Introduction

- India is known as the second largest fruits and vegetables producer in the world followed by China.
- India, during 2017-18 has produced about 97358 thousand MT fruits and 184394 thousand MT vegetables in about 6506 Thousand Ha and 10259 Thousand Ha respectively (Horticulture statistics At a glance, 2018, MoA & FW Gol). IN spite of this, the per capita availability of fruit in india is 107 gm/day which is below the recommended 120 gm/day.
- India's share of global exports of fresh fruits and processed fruit products is also quite meager compared to other major fruit producers of the world (Bung, 2012).
- **Unfortunately, fruits and vegetables being perishable in nature get wasted to the tune of 20-30 % in the supply chain due to improper handling, transportation and poor post harvest management; and only 2 % of them are processed in to value added products and the rest is consumed fresh.**
- Therefore, processing of fruits and vegetables offers immense scope for wastage minimization and value addition; thus can generate significant income and employment in indian agrarian economy. In india strawberry is one the important fruit crops cultivated in different areas and has huge potential for value addition and entrepreneurship development.

### 3. Origin, Distribution and Production of Strawberry

- The garden strawberry was first cross bred in Brittany, France in the 1750s via cross of *Fragaria virginiana* from eastern north America & *Fragaria chiloensis*, which was of Chile, and later run commercially, and the first strawberry named woodland strawberry which was first cultivated in the early 17<sup>th</sup> century was replaced by this hybrid.
- The new species gradually spread through the continent and did not become completely appreciated until the end of the 18<sup>th</sup> century. When a French excursion journeyed to Chile in 1712 introduced a strawberry plant with female flowers that resulted in the common strawberry that we have today.
- From botanical point of view it is not a berry, actually it is an aggregate accessory fruit from technically. Meaning that the fleshy part is not derived from the plant's ovaries but from the receptacle that holds the ovaries. Each apparent seed on the outside of the fruit is actually one of the ovaries of the flower, with a seed inside it.
- In India it is mainly produced in Himachal Pradesh, Uttar Pradesh, Maharashtra, West Bengal, Delhi, Haryana, Punjab, Rajasthan and Jammu Kashmir. In Gujarat work is going on for its start up.

### 4. Varieties

Important strawberry varieties cultivated in India are **Chandler**, Tioga, Torrey, Selva, Belrubi, Fern and **Pajaro**. Other varieties include Premier, Red cost, Local Jeolikot, Dilpasand, Bangalore, Florida 90, Katrain sweet, Pusa Early Dwarf, and Blakemor.

## 5. Health benefits and Nutritional Information

The heart-shaped silhouette of the fruit is the first clue that this is good for us. These potent little packages protect our heart, increase HDL (good) cholesterol, lowering the Blood Pressure and guard against cancer. Packed with Vitamins, fibre and high levels of Antioxidants, sodium free, fat free, cholesterol free, low calorie food. Very good source of manganese, Potassium and Vitamin C.

Here are a few of them listed.

1. Strawberry is low in calories (32 cal/100 g) and fats but rich source of health-promoting phytonutrients, minerals, and vitamins that are essential for optimum health.
2. Strawberries have significantly high amounts of phenolic flavonoid phytochemicals called **anthocyanins** and **ellagic acid**. Scientific studies show that consumption of these berries may have potential health benefits against cancer, aging, inflammation and neurological diseases.
3. Strawberry has an **ORAC value** (oxygen radical absorbance capacity, a measure of antioxidant strength) of about 3577  $\mu\text{mol TE}$  per 100 grams.
4. Fresh berries are an excellent source of **vitamin-C** (100 g provide 58.8 mg or about 98% of RDI), which is also a powerful natural antioxidant. Consumption of fruits rich in vitamin-C helps the body develop resistance against infectious agents, counter inflammation and scavenge harmful free radicals.

5. The fruit is rich in the B-complex group of vitamins. It contains good amounts of vitamin B-6, niacin, riboflavin, pantothenic acid and folic acid. These vitamins are acting as co-factors help the body metabolize carbohydrate, proteins, and fats.
  
6. Strawberries contain vitamin-A, vitamin-E and health promoting flavonoid poly phenolic antioxidants such as lutein, zeaxanthin, and beta-carotene in small amounts. These compounds help act as protective scavengers against oxygen-derived free radicals and reactive oxygen species (ROS) that play a role in aging and various disease processes.
  
7. Furthermore, They contain a good amount of minerals like potassium, manganese, fluorine, copper, iron and iodine. Potassium is an important component of cell and body fluids that helps controlling heart rate and blood pressure. The human body uses **manganese** as a co-factor for the antioxidant enzyme, *superoxide dismutase*.
  
8. Copper is required in the production of red blood cells. Iron is essential for red blood cell formation. Fluoride is a component of bones and teeth and offers protection from dental caries.

Strawberry Nutrition :- Values per 100 gm.

Principle	Nutrient Value	% RDA
Energy	32 Kcal	1.5 %
Carbohydrates	7.7 g	6 %
Protein	0.67 g	0.1 %

Total Fat	0.30 g	1 %
Cholesterol	0 mg	0 %
Dietary Fibre	2.0 g	5 %
<b>Vitamins</b>		
Folates	24 µg	6 %
Niacin	0.386 mg	2.5%
Pantothenic acid	0.125 mg	2.5%
Pyridoxine	0.047 mg	3.5 %
Riboflavin	0.022 mg	2%
Vitamin A	12 IU	0.5%
Vitamin C	58.5 mg	98%
Vitamin E	0.29 mg	2%
Vitamin K	2.2 µg	2%
<b>Electrolytes</b>		
Sodium	1 mg	0%
Potassium	153 mg	3%
<b>Minerals</b>		
Alcium	16 mg	1.6%
Iron	0.41 mg	5%
Magnesium	13 mg	3%
Manganese	0.386mg	17%
Zinc	0.14 mg	1%
<b>Phytonutrients</b>		
Carotene - β	7 µg	--
Lutein - zeaxanthin	26 µg	--

## 6. Cultivation, Bearing & Post Harvest management:-

### Cultivation :-

- Strawberry cultivars vary widely in size, color, flavor, shape, degree of fertility, season of ripening, liability to disease and constitution of plant.



Typical Strawberry cultivation image.

- An average strawberry has about 200 seeds on its external membrane. Some vary in foliage and some may vary materially in the relative development of their sexual organs.

- In most cases flower appear hermaphroditic in structure, but functions as either male or female. For commercial production purpose, plants are propagated from runners and, in general, distributed as either bare root plants or plugs.
  
- Cultivation follows one of two general models – annual plasticulture, or a perennial system of matted rows or mounds. Greenhouses produce a small amount of strawberries during the off season.
  
- The bulk of modern commercial productions uses the plasticulture system. In this method, raised beds are formed each year, fumigated & covered with plastic to prevent weed growth and erosion. Plants usually obtained from northern nurseries, are planted through holes punched in this covering, and irrigation tubing is run underneath. Runners are removed from the plants as they appear, in order to encourage the plant to put most of their energy into fruit development. At the end of the harvest season, the plastic is removed and the plants are plowed in to the garden. Because strawberry plants more than a year or two old begun to decline in productivity & fruit quality. This plant replacing system each year allows for improved yield & denser plantings. However, because it requires a longer growing season to allow for establishments of plants each year, and because of the increased costs in terms of forming and covering the mounds and purchasing plants each year, it is not always practical in all areas.
  
- The other major method, which uses the same plants from year to year growing in rows or on mounds, is most common in colder climates. It has lower investment costs , and lower overall maintenance requirements. Yields are typically lower than in plasticulture.

- Another method uses a composed stock. Plants grown in composed stock have been shown to produce significantly higher oxygen radical absorbance capacity (ORAC), flavonoids, anthocyanins, fructose, glucose, sucrose, malic acid and citric acid than fruit produced in black plastic mulch or matted row systems. Similar results in an earlier study conducted by USDA confirms hoe compost plays a role in the bioactive qualities if two strawberry cultivars.

### **Bearing:-**

Strawberries are often grouped according to their flowering habit. Traditionally this has consisted of a division between “June-bearing” strawberries, which bear their fruit in the early summer and “Ever-bearing” strawberries, which often bear several crops of fruit throughout the season. One plant throughout a season may produce 50 to 60 times or roughly once every three days.

Research publishes in 2001 showed that strawberries actually occur in three basic flowering habits: short-day, long-day and day-neutral. These refer to the day length sensitivity of the plant and the type of photoperiod that induces flower formation. Day-neutral cultivars produce flowers regardless of the photoperiod.

### **Post-harvest management:-**

Postharvest Rhizopus rot is controlled by **rapidly precooling the strawberry fruit immediately after harvest and maintaining the storage temperature below 6°C**. To help control Mucor fruit rot, all of the ripe fruit should be removed from the field.

## 7. Processing & Value Addition:-

- The fresh fruits have limited shelf life; therefore, it is necessary to process fresh fruits in to different value added products to increase its availability over an extended period and to stabilize the price during the glut season.
- The processed products have good potential for internal as well as external trade. Seasonal losses in surplus strawberry fruits can be avoided by processing into different value added products that make them more attractive to the buyer and/or more readily usable to the consumer.
- Strawberry being rich in taste can be used for preparation of natural jam and jelly. Processed strawberry pulp is an excellent raw material for preparation of juice, RTS beverages, nectar, powder, candy and preserve. In view of changing consumer attitude, demand and emergence of new market, it has become imperative to develop products that have nutritional as well as health benefits.
- In this context, strawberry has excellent digestive and nutritive value, pleasant flavour, high palatability and availability in abundance at little high price. strawberry is a very popular fruit in India and it is available throughout the year except few months. The nutritive value of the fruit is very high and thus it is an ideal crop for processing and value addition.

It is consumed in large quantities either fresh or in such prepared foods such as jam, juices, jellies, ice creams, milk shakes, **crushes**, Pulps, RTS, Nectars, Syrups, squashes, Juice powder, chutney, cheese, toffee, and chocolates.

In current days dried fruits or candied fruits are running fast in the market.

Artificial strawberry flavorings and aromas are also widely used products such as candy, soaps, lip gloss, perfume and much more.

Amongst the aforesaid usages Crush is the mostly used product currently.

## 8. Manufacturing process of the Strawberry Crush

Removal of Rotten, over ripened, contaminated,

diseased and decayed fruit



Raw Strawberry



Washing and sanitizing



Crushing



Cooking of fruit pulp (Crush)



Addition of other Raw Materials in mixing tank.

Sugar Sieving

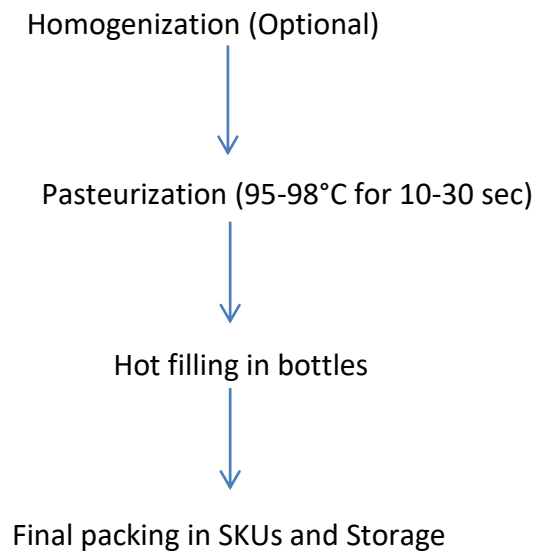


Sugar Syrup preparation



(Pulp 28%, Sugar, water, thickener, preservative, acidity regulator)





## 9. Location of the Proposed Project and Land

- The entrepreneur must provide description of the proposed location, site of the project, distance from the targeted local and distant markets; and the reasons/advantages thereof i.e. in terms of raw materials availability, market accessibility, logistics support, basic infrastructure availability etc.
- The ideal locations for establishment of exclusive Strawberry crush processing unit are in the production clusters of strawberry growing states such as Uttar Pradesh, Madhya Pradesh, West Bengal, Punjab, Haryana, Himachal Pradesh, Delhi, Rajasthan, Maharashtra and Jammu-Kashmir where adequate quantities of surplus raw materials can be available for processing.
- However, in other states of India multi fruit based beverage unit with Strawberry as one of the raw materials can be established.

## 10. Market Demand and Supply for Strawberry Crush

- The Fruit based non-alcoholic beverages such as RTS, Squash are part and parcel of consumption pattern both in rural and urban India.
- The fruit beverages consumption is picking up due to increasing income and changing food habits. Therefore, demand for fruit based beverages are prevalent across length and breadth of the country throughout the year.
- The juice market in India is divided into mainly three segments: fruit drinks (with maximum 30% fruit content) occupying about 50-60% market share, fruit juices (with almost 100% fruit content) occupying about 30-35% market share and nectar drinks (with almost 30-90% fruit content) occupying just about 10% market share of entire juice industry.
- Therefore, any kind of Ready to Serve (RTS) fruit based beverages have huge potential across India. Further, Strawberry being low in calories and fats but rich in vital vitamins (Vitamin-C, Vitamin-A) minerals (Potassium, Calcium, Magnesium, Phosphorus), dietary fiber, and antioxidant polyphenolic and flavonoid compounds can play a pivotal role to prevent cancers, aging, infections etc.
- Therefore, strawberry beverage if highlighted properly for all these health benefits can occupy significant beverage market.

## 11. Marketing Strategy for Strawberry Products

The increasing urbanization and income offers huge scope for marketing of fruit based products. Urban organized platforms such as departmental stores, malls, super markets can be attractive platforms to sell well packaged and branded Strawberry based products.

## 12. Detailed project Assumptions

- This model DPR for Strawberry based crush unit is basically prepared as a template based on certain assumptions that may vary with capacity, location, raw materials availability etc.
- An entrepreneur can use this model DPR format and modify as per requirement and suitability.
- The assumptions made in preparation of this particular DPR are given in This DPR assumes expansion of existing unit by adding new strawberry based RTS beverage line.
- Herewith in this DPR, we have considered the assumptions as listed below in the tables of different costs, which may vary as per region, seasons and machinery designs and supplier.
  1. Strawberry cost considered @ Rs. 60/- per kg.
  2. Sugar Cost considered @ Rs. 32/- per kg.
  3. Strawberry yield from raw fruit to processed pulp is considered as 90 %, which may vary depend on degree of ripening & Size of the fruit.
  4. Machinery cost may also vary from vendor to vendor.

- Land and civil infrastructures are assumed as already available with the entrepreneurs.

### 13. Project Start-up Costing Sheets

Detailed Project Assumptions		
Parameter	Assumption	
Capacity of the Straw berry crush Unit	150	MT/annum
Utilization of capacity	1st Year Implemetation, 70% in second, 80% in third and 90% in fourth year onwards	
Working days per year	300	days
Working hours per day	10	hours
Interest on term and working capital loan	12	
Repayment period	Seven year with one year grace period is considered.	
Average prices of raw material	Rs. 60 per Kg	
Average sale prices of RTS beverage/litre	145	Rs/kg
Pulp extraction	90	
RTS (25% pulp) processing	3.2 Kg Strawberry crush /Kg Strawberry	

#### Land and Building.

- Land and civil infrastructures are assumed as already available with the entrepreneurs.

Land and Civil Infrastructures	
1. Land 8000 sq. ft	Assumed land already developed and has 5000 sq. ft. built in area. So additional 1000 sq. ft. can be built @ Rs. 4.44 Lakhs
2. Built up processing area 5000 Sq. Ft.	
3. Storage area 1000 Sq. ft.	
<b>Total</b>	<b>Rs. 4.44 Lakhs</b>

### Machinery and Equipment

Sr. No.	Machinery Descriptions	Power required	Area Require (Sq. Ft.)	Qty.	Cost. Rs. (in Lacs)
1	Cold Store	2 HP	70	1	3.5
2	Washer Capacity 40 kg/hr	2HP	25	1	1.6
3	Fruit Pulper/extractor Capacity 40 kg / hr	3HP	16	1	2.2
4	Steam Kettle (Thermic fluid) Capacity 300 lit/ batch	1.5HP	25	1	1.8
5	Inline Homogenizer Capacity 500 ltr/Hr	2HP	50	1	1.8
6	Insulated Crush Storage Tank – 500 ltr	1.5 HP	200	1	1.5
7	Bottling line (with 3 parts i.e. washing unit with 50-100 bottles/hr,, filling unit 100 litres/hr and capping unit 100 litres/hr)	2HP	75	1	1.45

**Other costs:-**

Utilities and Fittings:-

Utilities and Fittings	
1. Water	Rs. 2.2 Lacs total
2. Power	

Other Fixed Assets:-

Other Fixed Assets	
1. Furniture & Fixtures	Rs. 0.9 lac total
2. Plastic tray capacity	
3. Electrical fittings	

Pre-operative expenses

Pre-operative Expenses	
Legal expenses, Start-up expenses, Establishment cost, consultancy fees, trials and others.	0.9 LAC
Total preoperative expenses	0.9 LAC

Contingency cost to be added as approx.1 Lac.

So total start up cost at own land & Premise may be somewhat similar to 18.85 lacs. This is according to survey done at X location india. This may vary on location, situation and design change over.

### Working capital requirement.

Particulars	Period	Year 2 (70%-70 MT)	Year 3 (80%- 80MT)	Year 4 (90%-90 MT)
Raw material stock	7 days	1.41	1.61	2.07
Work in progress	15 days	5.79	6.62	8.51
Packing material	15 days	0.90	1.03	1.32
Finished goods' stock	15 days	4.41	5.03	6.47
Receivables	30 days	8.81	10.07	12.95
Working expenses	30 days	0.98	1.12	1.44
Total current assets		22.30	25.48	32.76
Trade creditors		0.00	0.00	0.00
Working capital gap		22.30	25.48	32.76
Margin money (25%)		5.57	6.37	8.19
Bank finance		16.72	19.11	24.57

#### 14. Installed Capacity of the Strawberry Based Crush Processing Unit

The maximum installed capacity of the strawberry crush manufacturing unit in the present model project is proposed as 100 tonnes/annum or 350 kg/day raw strawberry. The unit is assumed to operate 300 days/annum @ 8-10 hrs/day. The 1<sup>st</sup> year is assumed to be construction/expansion period of the project; and in the 2<sup>nd</sup> year 70 percent capacity, 3<sup>rd</sup> year 80 percent capacity and 4<sup>th</sup> year onwards 90 percent capacity utilization is assumed in this model project.

### Total Project Cost and Means of Finance (Rs. in Lakhs)

Particulars	Rs. In Lakhs
Particulars	Amount in Lakhs
i. Land and building (20 x 32 x 12 ft -LxBxH)	4.44
ii. Plant and machinery	13.85
iii. Utilities & Fittings	2.2
iv. Other Fixed assets	0.9
v. Pre-operative expenses	0.90
vi. Contingencies	1.00
vii. Working capital margin	0.25
Total project cost	28.54
Net Sale per Day in Lacs	0.15
Net Profit Per Annum @300 working days	128.35
Payback Period	Less than 1 year

### Manpower Requirement

#### Particulars

Total Monthly Salary (Rs.)	No	Wages	Total Monthly	
Supervisor (can be the owner)	1	18000	18000	216000
Technician	1	14000	14000	168000
Semi skilled	2	7600	15200	

				182400
Helper	1	5500	5500	66000
Sales man	1	8000	8000	96000
<b>Total</b>	<b>6</b> Persons		<b>60700</b>	<b>728400</b>

### 15. Expenditure, Revenue & Profitability analysis.

150 MT

	Particulars	1st Year	2nd Year	3rd Year	4th Year	5th year	6th year
A	Total Installed Capacity (MT)	45 MT Strawberry/Ann um	105	120	135	135	135
	Capacity utilization (%)	Under Const.	70%	80%	90%	90%	90%
B	<b>Expenditure (Rs. in Lakh)</b>	0					
	Raw Strawberry(Av. Price @ Rs. 60/Kg )	0.00	16.38	18.72	21.06	21.06	21.06
	Sugar @ 32/kg	0.00	15.46	17.66	19.87	19.87	19.87
	Other ingredients	0.00	4.85	5.54	6.24	6.24	6.24
	Packaging materials (Rs 12 per Kg)	0.00	12.60	14.40	16.20	16.20	16.20
	Utilities (Electricity, Fuel)	0.00	1.98	2.26	2.55	2.55	2.55
	Salaries (1st yr only manager's salary)	2.16	7.28	7.28	7.28	7.28	7.28
	Repair & maintenance	0.00	0.70	0.80	0.90	0.90	0.90
	Insurance	0.30	0.30	0.30	0.30	0.30	0.30
	Miscellaneous expenses	0.50	2.30	2.30	2.30	2.30	2.30
	<b>Total Expenditure</b>	<b>2.96</b>	<b>61.85</b>	<b>69.28</b>	<b>76.70</b>	<b>76.70</b>	<b>76.70</b>
C	<b>Total Sales Revenue (Rs. in Lakh)</b>	<b>0.00</b>	<b>152.2</b> <b>5</b>	<b>174.0</b> <b>0</b>	<b>195.7</b> <b>5</b>	<b>195.7</b> <b>5</b>	<b>195.7</b> <b>5</b>
	Sale of Strawberry crush (Av. Sale Price @ Rs. 145/kg)	0.00	152.2 5	174.0 0	195.7 5	195.7 5	195.7 5
D	<b>PBDIT (Total exp.-Total sales rev.) (Rs. in Lakh)/Cash Inflows</b>	<b>-2.96</b>	<b>90.40</b>	<b>104.7</b> <b>2</b>	<b>119.0</b> <b>5</b>	<b>119.0</b> <b>5</b>	<b>119.0</b> <b>5</b>

	Depreciation on civil works @ 5% per annum	0.22	0.21	0.20	0.19	0.18	0.17
	Depreciation on machinery @ 10% per annum	1.89	1.70	1.53	1.37	1.24	1.11
	Depreciation on other fixed assets @ 15% per annum	0.47	0.40	0.34	0.29	0.24	0.21
	Interest on term loan @ 12%	1.53	1.53	1.29	1.05	0.81	0.57
	Interest on working capital @ 12%	0.00	2.01	2.29	2.95	2.95	2.95
E	Profit after depreciation and Interest (Rs. in Lakh)	<b>-7.06</b>	<b>86.57</b>	<b>101.37</b>	<b>116.15</b>	<b>116.58</b>	<b>116.99</b>
F	Tax (assumed 30%) (Rs. in Lakh)	<b>0.00</b>	<b>25.97</b>	<b>30.41</b>	<b>34.85</b>	<b>34.97</b>	<b>35.10</b>
G	Profit after depreciation, Interest & Tax (Rs. in Lakh)	<b>-7.06</b>	<b>60.60</b>	<b>70.96</b>	<b>81.31</b>	<b>81.61</b>	<b>81.89</b>
H	Surplus available for repayment (PBDIT- Interest on working capital-Tax) (Rs. in Lakh)	-3.00	57.00	66.30	75.30	75.00	74.80
I	Coverage available (Rs. in Lakh)	-3.00	57.00	66.30	75.30	75.00	74.80
J	Total Debt Outgo (Rs. in Lakh)	1.53	3.53	3.29	3.05	2.81	2.57
K	Debt Service Coverage Ratio (DSCR)	-1.96	16.15	20.15	24.69	26.69	29.11
	Average DSCR	19.14					
L	Cash accruals (PBDIT- Interest-Tax) (Rs. in Lakh)	-4.49	62.90	73.02	83.16	83.27	83.38
M	Payback Period						
	(on Rs. 30 Lakhs initial investment)	2 Years					

## 16.Repayment Schedule

Year	Amount in Lakhs								
	Outstandi ng loan at start of yr.	Disbursem ent	Total outstandi ng Loan	Surplus for repayme nt	Interes t payme nt	Repayme nt of principal	Total Outgo	o/s Loan at the end of the yr.	Balan ce left
1	0	14	14	-3	1.53	0	1.53	14	-1.47
2	14		14	57	1.53	2	3.53	12	53.47
3	12		12	66.3	1.29	2	3.29	10	63.01
4	10		10	75.3	1.05	2	3.05	8	72.25
5	8		8	75	0.81	2	2.81	6	72.19
6	6		6	74.8	0.57	2	2.57	4	72.23
7	4		4	74.77	0.33	2	2.33	2	72.44
8	2		2	74.76	0.09	2	2.09	0	72.67

## 17.Assets' Depreciation

Assets' Depreciation (Down Value Method)					Amounts in Lakhs			
Particulars	1st Year	2nd year	3 rd year	4th year	5th year	6th year	7th year	8th year
Civil works	4.44	4.218	4.0071	3.806745	3.61641	3.43559	3.2638	3.10062
Depreciation	0.222	0.2109	0.20036	0.190337	0.18082	0.17178	0.1632	0.15503
Depreciated value	4.218	4.0071	3.80675	3.616408	3.43559	3.26381	3.1006	2.94559
Plant & Machinery	18.85	16.965	15.2685	13.74165	12.3675	11.1307	10.018	9.0159
Depreciation	1.885	1.6965	1.52685	1.374165	1.23675	1.11307	1.0018	0.90159
Depreciated value	16.965	15.2685	13.7417	12.36749	11.1307	10.0177	9.0159	8.11431
Other Fixed Assets	3.1	2.635	2.23975	1.903788	1.61822	1.37549	1.1692	0.99379
Depreciation	0.465	0.39525	0.33596	0.285568	0.24273	0.20632	0.1754	0.14907
Depreciated value	2.635	2.23975	1.90379	1.618219	1.37549	1.16916	0.9938	0.84472
All Assets	26.39	23.818	21.5154	19.45218	17.6021	15.9418	14.451	13.1103
Depreciation	2.572	2.30265	2.06317	1.85007	1.6603	1.49118	1.3403	1.20569
Depreciated value	23.818	21.5154	19.4522	17.60211	15.9418	14.4506	13.11	11.9046

## 18.Financial Assessment of the project

Benefit Cost Ratio (BCR) and Net Present Worth (NPW)									
Particulars	1st Year	2nd year	3 rd year	4th year	5th year	6th year	7th year	8th year	
Capital cost (Rs. in Lakh)	28.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Recurring cost (Rs. in Lakh)	2.96	60.23	67.43	74.62	74.62	74.62	74.62	74.62	
Total cost (Rs. in Lakh)	31.50	60.23	67.43	74.62	74.62	74.62	74.62	74.62	532.26
Benefit (Rs. in Lakh)	0.00	152.25	174.00	195.75	195.75	195.75	195.75	195.75	
Total Depreciated value of all assets (Rs. in Lakh)									11.905
Total benefits (Rs. in Lakh)	0.00	152.25	174.00	195.75	195.75	195.75	195.75	207.65	1316.90
Benefit-Cost Ratio (BCR): (Highly Profitable project)	2.4742								

Net Present Worth (NPW): 828.34

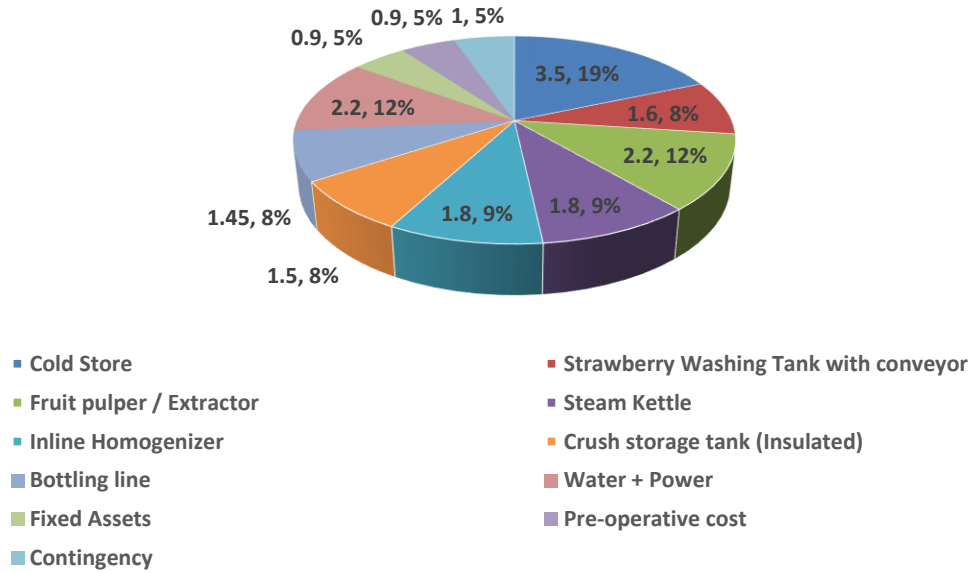
## 19. Break-even analysis

Sr. No.	Particulars	1st Yr	2nd yr	3 rd yr	4th yr	5th yr	6th yr	7th yr	8th yr
	Capacity utilization (%)	Under Const.	70%	80%	90%	90%	90%	90%	90%
	Production MT/Annum		105	120	135	135	135	135	135
<b>A</b>	<b>Fixed Cost (Rs. in Lakh)</b>								
	Permanent staff salaries	7.284	7.284	7.284	7.284	7.284	7.284	7.284	7.284
	Depreciation on building @ 5% per annum	0.222	0.2109	0.2004	0.1903	0.1808	0.1718	0.1632	0.155
	Depreciation on machinery @ 10% per annum	1.885	1.6965	1.5269	1.3742	1.2367	1.1131	1.0018	0.9016
	Depreciation on other fixed assets @ 15% per annum	0.465	0.3953	0.336	0.2856	0.2427	0.2063	0.1754	0.1491
	Interest on term loan	1.53	1.53	1.29	1.05	0.81	0.57	0.33	0.09
	Insurance	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	<b>Total Fixed Cost (Rs. in Lakh)</b>	<b>11.686</b>	<b>11.417</b>	<b>10.937</b>	<b>10.484</b>	<b>10.054</b>	<b>9.6452</b>	<b>9.2543</b>	<b>8.8797</b>
<b>B</b>	<b>Sales Revenue (Rs. in Lakh)</b>	<b>0</b>	<b>152.25</b>	<b>174</b>	<b>195.75</b>	<b>195.75</b>	<b>195.75</b>	<b>195.75</b>	<b>195.75</b>
<b>C</b>	<b>Variable Cost (Rs. in Lakh)</b>								
	Raw Strawberry (Av. Price @ Rs. 60/Kg )	0	16.38	18.72	21.06	21.06	21.06	21.06	21.06
	Sugar @ 32/kg	0	15.456	17.664	19.872	19.872	19.872	19.872	19.872
	Other ingredients	0	4.851	5.544	6.237	6.237	6.237	6.237	6.237
	Packaging materials	0	12.6	14.4	16.2	16.2	16.2	16.2	16.2
	Casual staff salaries	0	5.784	5.784	5.784	5.784	5.784	5.784	5.784
	Utilities (Electricity, Fuel)	0	1.9803	2.2632	2.5461	2.5461	2.5461	2.5461	2.5461
	Repair & maintenance	0	0.7	0.8	0.9	0.9	0.9	0.9	0.9
	Miscellaneous expenses	0.5	2	2	2	2	2	2	2
	Interest on working capital @ 12%	0	2.01	2.29	2.95	2.95	2.95	2.95	2.95
	<b>Total Variable Cost (Rs. in Lakh)</b>	<b>0.5</b>	<b>61.758</b>	<b>69.468</b>	<b>77.548</b>	<b>77.548</b>	<b>77.548</b>	<b>77.548</b>	<b>77.548</b>
<b>D</b>	<b>Break Even Point (BEP)</b>								
	as % of sale	-	12	10	8	8	7	7	6
	Break Even Point (BEP) in terms of sales value (Rs. in Lakhs)	-	18.27	17.4	15.66	15.66	13.703	13.703	11.745

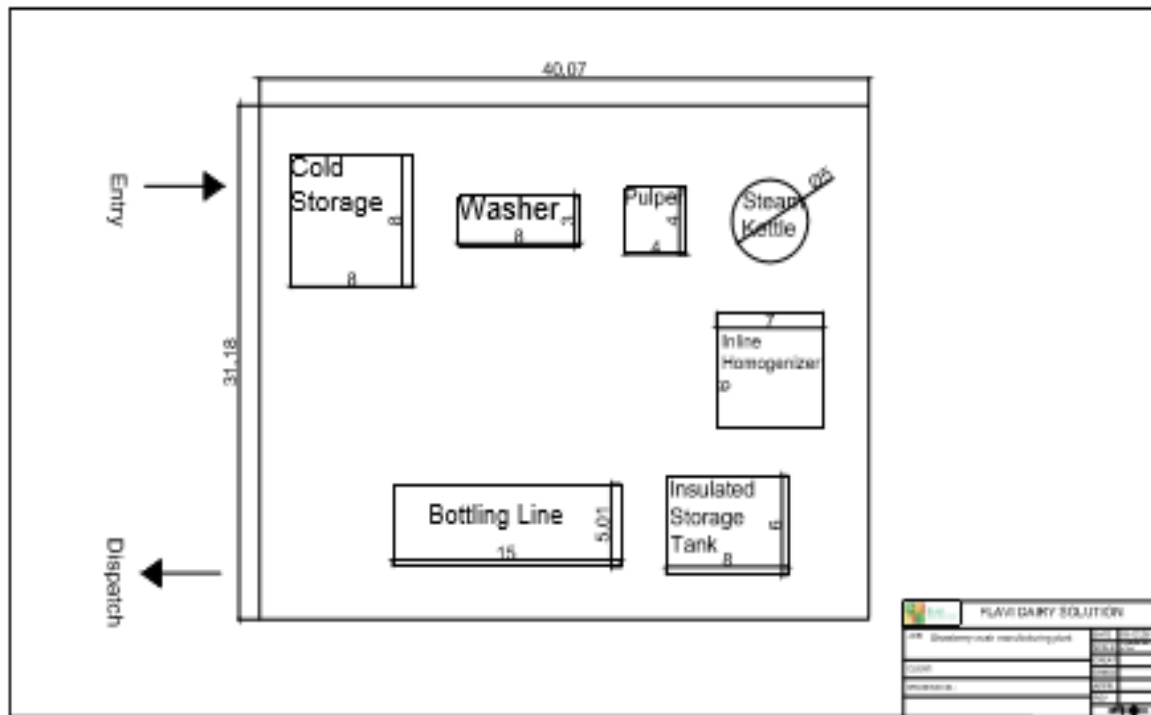
## 20 . Raw Material Requirements for the Unit

- A sustainable food processing unit must ensure maximum capacity utilization and thus requires an operation of minimum 280-300 days per year to get reasonable profit. Therefore, ensuring uninterrupted raw materials supply requires maintenance of adequate raw material inventory.
  
  - The processor must have linkage with producer organizations preferably FPCs through legal contract to get adequate quantity and quality of raw materials which otherwise get spoiled.
  
  - In the strawberry crush manufacturing project, the unit requires 233 kg/day, 266 kg/day and 300 kg/day raw ripened strawberry at 70, 80 and 90 percent capacity utilization, respectively.
  
  - If there are shortages in supply, then the entrepreneur can use pulp of other seasonal fruits for same purpose to achieve maximum capacity utilization for higher economic efficiency.
  
  - The strawberry must be plucked from plant at red or pinkish red and mature stage; and then stored below 6°C temperature.
- a. Pie chart for better understanding of expenses of each head.

**Amount (in Lakhs)**



## 21. Typical Strawberry Crush Manufacturing Unit Layout



## 22. Machinery Suppliers

There are many machinery suppliers available within India for fruits based beverage processing machineries and equipments. Some of the suppliers are:

1. Bajaj Processpack Limited, Noida, India 0
2. Shriyan Enterprises. Mumbai, India

## 23. Limitations of the DPR

- i. This DPR has provided only the basic standard components and methodology to be adopted by an entrepreneur while submitting a proposal under the Formalization of Micro Food Processing Enterprises Scheme of MoFPI.
- ii. This DPR is made to provide general methodological structure not for specific entrepreneur/crops/location. Therefore, information on the entrepreneur, forms and structure (proprietorship/partnership/cooperative/ FPC/joint stock company) of business, background of proposed project, location, raw material base/contract sourcing, entrepreneur's own SWOT analysis, market research, rationale of the project for specific location, community advantage/benefit, employment generation etc are not given in detail.
- iii. The present DPR is based on certain assumptions on cost, prices, interest, capacity utilization, output recovery rate and so on. However, these assumptions in reality may vary across places, markets and situations; thus the resultant calculations will also change accordingly.

#### **24. Guidelines for the Entrepreneurs**

- i. The success of any prospective food processing project depends on how closer the assumptions made in the initial stage are with the reality of the targeted market/place/situation. Therefore, the entrepreneurs must do its homework as realistic as possible on the assumed parameters.

- ii. This model DPR must be made more comprehensive by the entrepreneur by including information on the entrepreneur, forms and structure (proprietorship/partnership/cooperative/ FPC/joint stock company) of entrepreneur's business, project location, raw material costing base/contract sourcing, detailed market research, comprehensive dehydrated product mix based on demand, rationale of the project for specific location, community advantage/benefit from the project, employment generation, production/availability of the raw materials/crops in the targeted area/clusters and many more relevant aspects for acceptance and approval of the competent authority.
  
- iii. The entrepreneur must be efficient in managing the strategic, financial, operational, material and marketing aspects of a business. In spite of the assumed parameter being closely realistic, a project may become unsustainable if the entrepreneur does not possess the required efficiency in managing different aspects of the business and respond effectively in changing situations.
  
- iv. The machineries should be purchased after thorough market research and satisfactory demonstration.
  
- v. The entrepreneur must ensure uninterrupted quality raw materials' supply and maintain optimum inventory levels for smooth operations management.
  
- vi. The entrepreneur must possess a strategic look to steer the business in upward trajectory.

- vii. The entrepreneur must maintain optimum (not more or less) inventory, current assets. Selecting optimum source of finance, not too high debt-equity ratio, proper capital budgeting and judicious utilization of surplus profit for expansion is must.
- viii. The entrepreneur must explore prospective markets through extensive research, find innovative marketing strategy, and maintain quality, adjust product mix to demand.
- ix. The entrepreneur must provide required documents on land, financial transaction, balance sheet, further project analysis as required by the competent authority for approval.
- x. The entrepreneur must be hopeful and remain positive in attitude while all situations.