DETAILED PROJECT REPORT

CARROT CAKE MANUFACTURING UNIT.

INDIAN INSTITUTE OF FOOD PROCESSING TECHNOLOGY

Ministry of Food Processing Industries, Govt. of India

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Project At a Glance		
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11	Raw materials	Carrot
12	Major product outputs	Carrot cake
13	Total project cost (Lakhs)	33.84
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	Miscellaneous fixed assets	0.9
	Pre-operative expenses	0.90
	Contingencies	1.20
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14	Working capital Management (In Lakhs)	
	Second Year	25.06
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	Subsidy grant by MoFPI (max 10 lakhs)	9.98
	Promoter's contribution (min 20%)	7.95
	Term loan (45%)	15.90
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17	Profit after Depreciation, Interest & Tax	
	2nd year	115.17
	3rd year	140.04
	4th year	163.17
18	Average DSCR	2.16
	Benefit Cost Ratio	2.72
	Term Loan Payment	7 Years with 1 year grace period
	Pay Back Period for investment	2 Years

Note: All the data/contents of this DPR are taken from the available information on IIFPT site.

1 GENERAL OVERVIEW OF CARROT PRODUCTION, CLUSTERS, POST-HARVEST MANAGEMENT AND VALUE ADDITION IN INDIA

1.1 INTRODUCTION

The carrot (*Daucus carota* subsp. *sativus*) is a root vegetable, usually orange in color, though purple, black, red, white, and yellow cultivars exist. They are a domesticated form of the wild carrot, *Daucus carota*, native to Europe and Southwestern Asia. The plant probably originated in Persia and was originally cultivated for its leaves and seeds. The most commonly eaten part of the plant is the taproot, although the stems and leaves are also eaten. The domestic carrot has been selectively bred for it's greatly enlarged, more palatable, less woody-textured taproot.

The carrot is a biennial plant in the umbellifer family, *Apiaceae*. At first, it grows a rosette of leaves while building up the enlarged taproot. Fast-growing cultivars mature within three months (90 days) of sowing the seed, while slower-maturing cultivars need a month longer (120 days). The roots contain high quantities of alpha- and beta-carotene, and are a good source of vitamin K and vitamin B6.

The United Nations Food and Agriculture Organization (FAO) reports that world production of carrots and turnips (these plants are combined by the FAO) for 2018 was 40 million tonnes, with 45% of the world total grown in China. Carrots are widely used in many cuisines, especially in the preparation of salads, and carrot salads are a tradition in many regional cuisines.

1.2 ORIGIN, DISTRIBUTION AND PRODUCTION OF CARROT

Both written history and molecular genetic studies indicate that the domestic carrot has a single origin in Central Asia. Its wild ancestors probably originated in Persia (regions of which are now Iran and Afghanistan), which remains the centre of diversity for the wild

carrot *Daucus carota*. A naturally occurring subspecies of the wild carrot was presumably breed selectively over the centuries to reduce bitterness, increase sweetness and minimise the woody core; this process produced the familiar garden vegetable.

When they were first cultivated, carrots were grown for their aromatic leaves and seeds rather than their roots. Carrot seeds have been found in Switzerland and Southern Germany dating back to 2000–3000 BC. Some close relatives of the carrot are still grown for their leaves and seeds, such as parsley, cilantro, coriander, fennel, anise, dill and cumin. The first mention of the root in classical sources is from the 1st century AD; the Romans ate a root vegetable called *pastinaca*, which may have been either the carrot or the closely related parsnip.

The plant is depicted and described in the Eastern Roman Juliana Anicia Codex, a 6th-century AD Constantinopolitan copy of the Greek physician Dioscorides 1st-century pharmacopoeia of herbs and medicines, De Materia Medica. Three different types of carrots are depicted, and the text states that "the root can be cooked and eaten".

1.3 VARIETIES

Varieties of carrots are divided into categories based on their shape. There are four different carrot types which are described they include Danvers, Nantes Imperator, Chantenay and Ball (or Mini):

- ***Danvers –*** When most people think of a carrot this is the type that they visual. They are long, skinny, taper to a point and typically are orange in color, although they are available in more shades. The foliage and taproot are longer than Chantenay. They are more tolerant to poor soil. The name comes from where they were developed in Danvers, Massachusetts. Preferred varieties include ‘Yellowstone.'

- ***Nantes –*** They were first described as almost perfectly cylindrical being both round at the tip and top, having sparse foliage and with near red flesh that was sweet flavor and nice

crunch. Their name is taken from the Atlantic coast of France where the area is ideal for growing this type of carrot. This category can also be referred to as Scarlet Nantes, Early Coreless or Nante Superior. There is estimated to be over 40 different varieties of carrots that fall into this category. A very quick growing carrot and matures faster. Preferred varieties include: 'Napoli', 'Touchon', 'Napa' or 'White Satin.'

- ***Imperator –*** This category is what most commercial growers produce and commonly found in grocery stores throughout the country. They are very similar looking to Danvers, but thicker in width and often a higher sugar content than the other categories. The foliage is very fast growing compared. The roots of this grouping is longer than all others listed above. Preferred varieties include: 'Japanese Imperial Long', 'Cosmic Red' or 'Sugarsnax 54.'

- ***Chantenay –*** Before Nantes were developed this category was the best to plant in heavy or rocky soil due to its size. Chantenay typically only reach 6 to 7 inches long making them very short and broad. These are a great choice for those gardening in containers or soil described above. However, it is important to harvest at the length mentioned because they do become woody and not tasty if harvested too late in the season. Very vigorous top growth and store extremely well. Preferred varieties include: 'Red-Cored Chantenay', 'Hercules' or 'Carson Hybrid.'

- ***Ball or Mini –*** This grouping includes carrot varieties that are shaped like radishes or miniature compared to Chantenay. Again they work extremely well for those gardening in containers due to their short taproot and required growing area. The miniature forms that only reach about 3 to 4 inches long are typically served whole with the tops attached. Radish-shaped varieties are typically cross-sectioned to see the beautiful circular pattern inside. Preferred varieties include: 'Babette', 'Romeo' or 'Paris Market.'

1.4 HEALTH BENEFITS AND NUTRITIONAL INFORMATION

Nutritional value:

The nutrition facts for two small-to-medium raw carrots (100 grams) are:

- Calories: 41
- Water: 88%
- Protein: 0.9 grams
- Carbs: 9.6 grams
- Sugar: 4.7 grams
- Fiber: 2.8 grams
- Fat: 0.2 grams

Carrots are a good source of several vitamins and minerals, especially biotin, potassium, and vitamins A (from beta carotene), K1 (phylloquinone), and B6.

- **Vitamin A:** Carrots are rich in beta carotene, which your body converts into vitamin A. This nutrient promotes good vision and is important for growth, development, and immune function.
- **Biotin:** A B vitamin formerly known as vitamin H, biotin plays an important role in fat and protein metabolism.
- **Vitamin K1:** Also known as phylloquinone, vitamin K1 is important for blood coagulation and can promote bone health.
- **Potassium:** An essential mineral, potassium is important for blood pressure control.
- **Vitamin B6:** A group of related vitamins, B6 is involved in the conversion of food into energy.

Other plant compounds:

The main plant compounds in carrots are:

- **Beta carotene:** Orange carrots are very high in beta carotene. The absorption is better (up to 6.5-fold) if the carrots are cooked.
- **Alpha-carotene:** An antioxidant that, like beta carotene, is partly converted into vitamin A in your body.
- **Lutein:** One of the most common antioxidants in carrots, lutein is predominantly found in yellow and orange carrots and is important for eye health.
- **Lycopene:** A bright red antioxidant found in many red fruits and vegetables, including red and purple carrots, lycopene may decrease your risk of cancer and heart disease.
- **Polyacetylenes:** Recent research has identified bioactive compounds in carrots that may help protect against leukemia and other cancers.
- **Anthocyanins:** These are powerful antioxidants found in dark-colored carrots.

CONSTITUENTS AND HEALTH BENEFITS OF CARROTS

Health benefits:

1. Reduces Risks of Cancer:

Consuming carrots can reduce your risks of having colon, stomach and prostate cancer. Well, this is because carrots have carotenoid which is an antioxidant that strengthens your immune system and reduces your risks of developing cancer. According to a study by the Centers for Disease Control and Prevention, carrots need to be added to your everyday diet as this will help your immune system to fight various deadly diseases. Moreover, the study concluded that both orange and carrots can reduce your risks of cardiovascular diseases as well as cancer.

2. Reduces Cholesterol in Blood:

Traditionally speaking, the primary cause of any heart disease is cholesterol in your blood and consuming carrots will keep you safe from getting hitched with cholesterol. The rich source of fibre that is found in carrots is usually soluble fibre which is the primary reason for lowering down cholesterol in your blood. All you need to do is to add carrots to your everyday diet and prevent yourself from the risks of developing cholesterol related problems.

3. Aids in Weight loss:

If you are a diet enthusiast and prefer losing out weight most often, you need to add carrots on your regular diet. This is because carrots are rich in fibre that takes longer to digest and as a result this makes you feel full most often. This will also prevent you from snacking on fatty foods.

4. Helps in Good Vision:

If you are suffering from bad eyesight, then carrots can help improve your state of vision. It has been considered as a full-proof remedy that can save you from bad eyesight. This can also help you see better in the dark. Moreover, the substance that makes carrots aid good eyesight is that it is rich in lycopene and lutein including vitamin A.

5. Ensures Normal Bowel Movements And Digestion:

The high amounts of dietary fibre in carrots aids in good digestion and ensure that you have normal stools. Fibre makes your stool bulky and as a result, this will help you pass healthy and normal stools. Say goodbye to constipation and yes to carrots.

6. Carrots are good for Your Skin:

Just as the skin of the carrot is red and shiny, consuming carrots will give your skin a radiant glowing texture. Not just that your skin will benefit from eating a carrot, but your nails too.

This because carrots have high amounts of silicon content in their root that helps maintain healthy nails and skin. In order to get the best nutrients out of carrots, you need to consume them raw.

7. A Good Boost for Your Immunity:

Carrots are a good boost for your immunity as they are rich in antioxidants, vitamin K and B6. All of these factors contribute to a stronger nervous system, better bone health and higher brain power. The antioxidants in the vegetable protect the body from harmful bacteria, inflammation and viruses that can be deadly. Thus, all of these put together constitute a better and stronger immune system that can prevent you from a bastion of diseases.

1.5 CULTIVATION, BEARING & POST HARVEST MANAGEMENT:-

Carrot (*Daucus carota*) is a biennial plant. In the first year, its rosette of leaves produces large amounts of sugars, which are stored in the taproot to provide energy for the plant to flower in the second year.

Soon after germination, carrot seedlings show a distinct demarcation between taproot and stem: the stem is thicker and lacks lateral roots. At the upper end of the stem is the seed leaf. The first true leaf appears about 10–15 days after germination. Subsequent leaves are alternate (with a single leaf attached to a node), spirally arranged, and pinnately compound, with leaf bases sheathing the stem. As the plant grows, the bases of the seed leaves, near the taproot, are pushed apart. The stem, located just above the ground, is compressed and the internodes are not distinct. When the seed stalk elongates for flowering, the tip of the stem narrows and becomes pointed, and the stem extends upward to become a highly branched inflorescence up to 60–200 cm (20–80 in) tall.

Most of the taproot consists of a pulpy outer cortex (phloem) and an inner core (xylem). High-quality carrots have a large proportion of cortex compared to core. Although a completely xylem-free carrot is not possible, some cultivars have small and deeply

pigmented cores; the taproot can appear to lack a core when the color of the cortex and core are similar in intensity. Taproots are typically long and conical, although cylindrical and nearly-spherical cultivars are available. The root diameter can range from 1 cm (⅜ in) to as much as 10 cm (4 in) at the widest part. The root length ranges from 5 to 50 cm (2 to 20 in), although most are between 10 and 25 cm (4 and 10 in).

Carrots are grown from seed and can take up to four months (120 days) to mature, but most cultivars mature within 70 to 80 days under the right conditions. They grow best in full sun but tolerate some shade.] The optimum temperature is 16 to 21 °C (61 to 70 °F). The ideal soil is deep, loose and well-drained, sandy or loamy, with a pH of 6.3 to 6.8.

Fertilizer should be applied according to soil type because the crop requires low levels of nitrogen, moderate phosphate and high potash. Rich or rocky soils should be avoided, as these will cause the roots to become hairy and/or misshapen. Irrigation is applied when needed to keep the soil moist. After sprouting, the crop is eventually thinned to a spacing of 8 to 10 cm (3 to 4 in) and weeded to prevent competition beneath the soil.

Cultivation and Bearing:-

Carrot is an important root crop cultivated throughout the world for its fleshy edible roots. Carrot farming is done in the spring, summer, and autumn in temperate climate countries and during winter in tropical and subtropical regions.

Roots of carrot are used as a vegetable for soups & curries; graded roots are used as a salad, tender roots as pickles also Carrot halwa and jam are famous.

Carrot juice is a rich source of carotene and is sometimes used for colouring buffer and other food particles. Carrot tops are used for extraction of leaf protein, as fodder, and also for poultry feed.

Carrots possess many medicinal properties and are used in Ayurvedic medicine. Carrots are a rich source of b-carotene and contain appreciable amounts of thiamine and riboflavin

The Carrot crop is the second most popular vegetable in the world after potato. China ranks first in production, followed by Russia.

The major carrot growing states in India are Karnataka, Punjab, Uttar Pradesh, Tamil Nadu, and Andhra Pradesh.

Carrots can be grown well in a wide variety of soils. However, commercial carrot farming's ideal soil should be deep, loose, well-drained, and rich in humus. Loamy or sandy loam soils with sufficient quantities of humus are well suited to the cultivation of carrots.

The ideal pH range for obtaining a good yield is 5.5-6.5. Soils with pH up to 7.0 can also be used, but too alkaline or acidic soils are unsuitable for this crop.

Carrot is a cold-weather crop, and it also does well in warm climates. The optimum temperatures for getting excellent growth is between 16 to 20 °C, while temperatures above 28°C drastically reduce top growth. Temperatures lower than 16°C affect the development of color and result in long slender roots, while higher temperatures produce shorter and thicker roots. The temperatures between 15 and 20°C result in attractive roots with excellent red color and quality.

Early carrots are harvested when they are partially developed. For distinct markets, otherwise, they are retained in the soil till they reach the full maturity stage they should not be retained full maturity stage because they become hard and is unfit for consumption.

Carrots are harvested when the roots are about 1.8 cm or larger in diameter at the upper end. The soil may be loosened with a special plow (carrot lifter) or an ordinary plow.

The field is irrigated once a day before harvesting to facilitate harvest.

After harvesting, the carrots are placed in a packing house in crates before washing. After that, carefully wash Carrots and sort them by size before packaging.

Post-harvest management:-

There are some fruit handling management after harvesting to avoid post-harvest losses. Following are Post-harvesting handling practices:

- Fruits are graded according to their size and color. All the diseased, deformed, bruised and unripe fruits are sorted out.
- Ethylene gas is used for treating the unripe carrot s such that they develop yellow or carrot color.
- Do not leave harvested fruit out in the hot sun;
- Do not pick cold, wet fruit. When wet turgid fruit is handled the oil
- Glands can be ruptured. The released oil burns the fruit surface (oleocellosis) and also stimulates fungal spores to germinate. The burn Marks can take 2-3 days to develop;
- Wear cotton gloves when harvesting. This reduces chances of getting injured.
- Use picking bags. This reduces damage as a result of abrasion on
- Wooden or metal picking bins and allows fruit to be gently lowered into
- Bulk harvesting bins;
- Do not leave stems on fruit or damage buttons by “plugging”;
- Use clean, smooth harvesting bins;
- Make sure packing line equipment is cleaned regularly. This reduces dirt and wax buildup which can cause fruit abrasion;
- Reduce packing line abrasion by using foam, rubber and smooth belts to Cushion fruit;
- Remove old and rotten fruit regularly from the packing shed and surrounds;
- Treat harvested fruit with a registered fungicide within 24hrs of harvest;

The general practice is to wash the harvested fruits with chlorine and coat them with a shine wax so that the fruits look fresh. They are dried at a temperature of 50-55˚C after coating. If the fruits have to be transported over longer distances, then they are packed in wooden boxes else baskets made of bamboo and mulberry are used for packing oranges. The boxes or baskets have to be ventilated and the fruits should be wrapped in tissue paper or newspaper for protection.

1.6 PROCESSING & VALUE ADDITION:-

Cake occupies an important place among bakery products. The cake contributes about 15% to the total production of bakery products produced in the country. However value wise it contributes to over 30% to the total value. The production of cake in India is estimated at 5 lakh tones and it is expected to increase at the rate of 10%per annum.

Cake- is a unique bakery products which has a very soft and spongy texture. It is a sweet product and has a very high calorific value in view of the high amount of fat present (40-60%). It has also good nutritional quality because it contains egg, milk, fruits, nuts etc. Unlike other bakery products like bread and biscuits which are made from a dough, the cake is made from a batter. The cake is mainly leavened by the air that gets incorporated during mixing of the batter. However chemical leavening agents are also used to support leavening. The retention of the air in the batter has been achieved by the egg used in the recipe. Value addition will increase the trend and varieties in cake with broad range of formulations and nutritional quality.

Carrots (*Daucus carota L*.) are rather inexpensive and it is highly nutritious as it contains appreciable amount carotene. Total vitamins B1, B2, B6 and B12 besides being rich in carotene. Vitamin – A in carrot ranges between 2055 to 9100 IU/100g. High carotenoid intake is associated with lowering risk of many cancers, especially the prostate cancer. Further, vitamin A is an antioxidant which is key to the growth and repair of tissues and helps the body to fight with infections, keep eyes healthy, nourish epithelial tissues in the lungs, as well as of the skin. Apart from being high in carotenoids, carrots are also high in dietary fiber. Carrots also contain a significant supply of calcium, potassium and phosphorus.

Value addition of carrot in cake increases the nutritional profile and helps in proper utilization of crop by reducing wastage. It helps farmers to produce higher shelf-life product with reasonable higher income.

2. MODEL CARROT CAKE PROCESSING UNDER FME SCHEME

2.1 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 major carrot growing states in India are Karnataka, Punjab, Uttar Pradesh, Tamil Nadu, and Andhra Pradesh.

2.2 INSTALLED CAPACITY OF THE CARROT CAKE PROCESSING UNIT

The maximum installed capacity of the Carrot cake manufacturing unit in the present model project is proposed as150 tonns/annum or 500 kg/day Carrot cake. The unit is assumed to

operate 300 days/annum @ 8-10 hrs/day. The 1st year is assumed to be construction/expansion period of the project; and in the 2nd year 70 percent capacity, 3rd year 80 percent capacity and 4th year onwards 90 percent capacity utilization is assumed in this model project.

2.3 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 Carrot cake manufacturing project, the unit requires 350 kg/day, 400 kg/day and 450 kg/day Carrot vegetable at 70, 80 and 90 percent capacity utilization, respectively. The Mature Carrot must be plucked from plant; and then stored below 6°C temperature.

2.4 MANUFACTURING PROCESS OF THE CARROT CAKE

PREPARATION OF CARROT CAKE:

1. For preparation of carrot cake, ingredients like maida flour, fat, sugar, egg, shredded carrot and baking powder are weighed, sieved and kept ready for processing.
2. Fat and sugar are creamed in planetary mixer.
3. Eggs are added to the creamed mixture at five regular intervals.
4. After that maida flour, shredded carrot, baking powder and vanilla essence are added to the planetary mixer and allowed to mix for 5 minutes.
5. After mixing, the prepared cake batter are poured on to the greased trays, and the trays are kept in trolley.
6. Then they are moved into rotor oven and baking is done at 1800 C for 35 minutes.
7. After baking, trolley is removed from oven.

8. Cake is then cooled to room temperature and cut into uniform pieces.

The typical Procedure for manufacturing of Carrot cake is as below:

Flow chart for Carrot cake:

Weighing of dry and wet ingredients

Fat and sugar are creamed in planetary mixer

Eggs are added @ five regular intervals

Maida flour, shredded carrot, baking powder and vanilla essence are added

Place in a tray and Bake at 180ºC for 35min

2.5 MARKET DEMAND AND SUPPLY FOR CARROT CAKE

Carrots are a member of the *Apiaceae* (formerly called *Unbelliferae*) family, which also includes celery, anise, dill, and cilantro. They are a biennial crop, producing their taproot the first year, and, if left to grow, would flower, set seed and die the second year. Although most all the carrots marketed in the United States today are orange, other colors such as red, yellow, or purple can occasionally be found in various fresh, frozen, and juice products. All carrots can be eaten root to tip, with the leaves often added to salads.

Carrots are primarily consumed fresh and are the 6th most consumed fresh vegetable in the U.S. Consumption of fresh carrots peaked in 1997 at 6.3 kgs per person and since then has dropped off and settled into a stable amount of approximately 3.7 kgs per person in 2015 (Vegetable and Melon Outlook, 2016). In contrast, consumption of frozen carrots averaged 0.6 kg per person.

Carrots are very high in beta carotene, and also contain Vitamin C, Vitamin K, potassium, other vitamins and minerals, and dietary fiber. In this century, carrots have become a popular cooking vegetable, salad item, snack food, and raw vegetable.

The upsurge in carrot popularity came after 1986 with the introduction of "baby-cut" carrots, which are packaged petite carrots made by chopping down and polishing much larger versions of the vegetable. "Baby carrots" are actually very young carrots that are harvested while the vegetables are still quite tiny. Baby-cut carrot products have been the fastest growing segment of the carrot industry since the early 1990s and are among the most popular produce items in the supermarket aisle.

Approximately 6.3 percent of the fresh carrots supply in 2015 was exported. Imports totaled more than 19 thousand crores kgs. Major carrot imports come from Canada and Mexico.

2.6 MARKETING STRATEGY FOR CARROT CAKE

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 Carrot products.

2.7 DETAILED PROJECT ASSUMPTIONS

This model DPR for Carrot cake 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 fruit processing unit by adding new juice manufacturing line. Therefore, land and civil infrastructures are assumed as already available with the entrepreneurs.

- 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. Carrot cost considered @ Rs.15/-per kg.
    2. 1 kg Carrot will produce 50% recovery.
    3. 1 Batch size is approximately 100 kg.
    4. No. of hours per day are approximately 8-10 hours.
    5. Batch yield is 95%

Detailed Project Assumptions		
Parameter	Assumption	
Capacity of the Carrot cake Unit	150	MT/annum
Utilization of capacity	1st Year Implementation, 55% in second, 65% in third, 75% in fourth year, 90% in fifth & 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	15	
Average sale prices per Kg	300	Rs/kg
Pulp extraction	50	
CARROT CAKE	1 kg Carrot cake from 0.15 Kg Carrot vegetable	

2.8 FIXED CAPITAL INVESTMENT

2.8.1 MACHINERY AND EQUIPMENT

Sr No.	Equipment	Capacity	Quantity	Price (Rs. In Lacs)
1	Cold store sq. meter	1	1500 Kg	6
2	Planetary mixer	1	30 Kg/Batch	0.8
3	Moulding tray	100	Suitable	1.4
4	Rotary oven	1	100 kg/Batch	5.5
5	Pillow packing machine	1	80PPM	2.25
6	Weighing balance	1	Suitable	0.06

7	Accessories	1	Suitable	0.5
			Total	16.51

2.8.2 OTHER COSTS:-

Utilities and Fittings:-

Utilities and Fittings	
1.Water	Rs. 0.8Lacs total
2.Power	

Other Fixed Assests:

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.1.2 Lac.

So total startup cost at own land & Premise may be somewhat similar to 33.84 lacs. This is according to survey done at X location India. This may vary on location, situation and design change over.

2.9 WORKING CAPITAL REQUIREMENTS

Particulars	Period	Year 2 (55%)	Year 3 (65%)	Year 4 (75%)
Raw material stock	7 days	2.82	3.34	4.55
Work in progress	15 days	5.65	6.67	9.10
Packing material	15 days	1.13	1.33	1.81
Finished goods' stock	15 days	7.63	9.02	12.30
Receivables	30 days	15.27	18.04	24.61
Working expenses	30 days	0.92	1.08	1.48
Total current assets		33.41	39.49	53.85
Trade creditors		0.00	0.00	0.00
Working capital gap		33.41	39.49	53.85
Margin money (25%)		8.35	9.87	13.46
Bank finance		25.06	29.62	40.39

2.10TOTAL PROJECT COST AND MEANS OF FINANCES

Particulars	Amount in Lakhs
i. Land and building (20 x 32 x 12 ft - LxBxH)	5.18
ii. Plant and machinery	16.51
iii. Utilities & Fittings	0.8
iv. Other Fixed assets	0.9
v. Pre-operative expenses	0.90
vi. Contingencies	1.20
vii. Working capital margin	8.35
Total project cost (i to vii)	33.84
Means Of finance	
i. Subsidy	9.98
ii. Promoters Contribution	7.95
iii. Term Loan (@10%)	15.91

2.11 MANPOWER REQUIREMENTS

Total Monthly Salary (Rs.)	No	Wages	Total Monthly	Total Annualy
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
			60700	728400

2.12 EXPENDITURE, REVENUE AND PROFITABILITY ANALYSIS

	Particulars	1st Year	2nd Year	3rd Year	4th Year	5th year	6th year
A	Total Installed Capacity (MT)	22.5 MT Carrot/Annum	82.5	97.5	112.5	135	150
	Capacity utilization (%)	Under Const.	55%	65%	75%	90%	100%
B	**Expenditure (Rs. in Lakh)**	0					
	Carrot (Av. Price @ Rs. 15/Kg)	0.00	0.84	0.99	1.14	1.37	1.53
	Maida @ Rs. 25/kg	0.00	3.68	4.34	5.01	6.01	6.68
	Sugar @ Rs. 35/kg	0.00	6.85	8.10	9.34	11.21	12.46
	Fat @ Rs. 90/kg	0.00	17.62	20.82	24.03	28.83	32.03
	Egg @ Rs. 80/Kg	0.00	17.64	20.85	24.06	28.87	32.08
	Other materials	0.00	8.77	10.36	11.95	14.34	15.94
	Packaging materials (Rs 12 per Kg)	0.00	12.38	11.70	13.50	16.20	18.00
	Utilities (Electricity, Fuel)	0.00	1.19	1.40	1.62	1.94	2.16
	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
	Total Expenditure	**2.96**	**79.54**	**89.25**	**101.44**	**119.57**	**131.66**
C	**Total Sales Revenue (Rs. in Lakh)**	**0.00**	**247.50**	**292.50**	**337.50**	**337.50**	**337.50**
	Sale of Carrot cake (Av. Sale Price @ Rs.300/kg)	0.00	247.50	292.50	337.50	337.50	337.50
D	**PBDIT (Total exp.-Total sales rev.) (Rs. in Lakh)/Cash Inflows**	**-2.96**	**167.96**	**203.25**	**236.06**	**217.93**	**205.84**
	Depreciation on civil works @ 5% per annum	0.26	0.25	0.23	0.22	0.21	0.20

	Depreciation on machinery @ 10% per annum	1.65	1.49	1.34	1.20	1.08	0.97
	Depreciation on other fixed assets @ 15% per annum	0.12	0.10	0.09	0.07	0.06	0.05
	Interest on term loan @ 12%	1.65	1.60	1.53	1.46	1.39	1.30
	Interest on working capital @ 12%	0.00	3.01	3.01	3.01	3.01	3.01
E	Profit after depreciation and Interest (Rs. in Lakh)	**-6.64**	**164.53**	**200.06**	**233.10**	**215.19**	**203.31**
F	Tax (assumed 30%) (Rs. in Lakh)	**0.00**	**49.36**	**60.02**	**69.93**	**64.56**	**60.99**
G	Profit after depreciation, Interest & Tax (Rs. in Lakh)	**-6.64**	**115.17**	**140.04**	**163.17**	**150.63**	**142.32**
H	Surplus available for repayment (PBDIT-Interest on working capital-Tax) (Rs. in Lakh)	1.65	1.60	1.53	1.46	1.39	1.30
I	Coverage available (Rs. in Lakh)	1.65	1.60	1.53	1.46	1.39	1.30
J	Total Debt Outgo (Rs. in Lakh)	0.55	0.61	0.67	0.74	0.82	0.91
K	Debt Service Coverage Ratio (DSCR)	3.00	2.62	2.28	1.97	1.69	1.44
	Average DSCR	2.16					
L	Cash accruals (PBDIT- Interest-Tax) (Rs. in Lakh)	-4.61	117.00	141.70	164.67	151.99	143.55
M	Payback Period	2.5 Years					
	(on Rs. 33.84 Lakhs initial investment)						

2.13 REPAYMENT SCHEDULE

Year	Beginning	PMT	Interest	Principal	Ending Balance
1	1,590,654.37	220,654.27	165,428.05	55,226.22	1,535,428.15
2	1,535,428.15	220,654.27	159,684.53	60,969.75	1,474,458.41
3	1,474,458.41	220,654.27	153,343.67	67,310.60	1,407,147.81
4	1,407,147.81	220,654.27	146,343.37	74,310.90	1,332,836.90

5	1,332,836.90	220,654.27	138,615.04	82,039.24	1,250,797.67
6	1,250,797.67	220,654.27	130,082.96	90,571.32	1,160,226.35
7	1,160,226.35	220,654.27	120,663.54	99,990.73	1,060,235.62
8	1,060,235.62	220,654.27	110,264.50	110,389.77	949,845.84
9	949,845.84	220,654.27	98,783.97	121,870.31	827,975.54
10	827,975.54	220,654.27	86,109.46	134,544.82	693,430.72
11	693,430.72	220,654.27	72,116.79	148,537.48	544,893.24
12	544,893.24	220,654.27	56,668.90	163,985.38	380,907.86
13	380,907.86	220,654.27	39,614.42	181,039.86	199,868.00
14	199,868.00	220,654.27	20,786.27	199,868.00	(0.00)
		3,089,159.85	1,498,505.47	1,590,654.37	(1,590,654.37)

2.14 ASSET'S 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	5.18	4.92	4.67	4.44	4.22	4.01	3.81	3.62
Depreciation	0.26	0.25	0.23	0.22	0.21	0.20	0.19	0.18
Depreciated value	4.92	4.67	4.44	4.22	4.01	3.81	3.62	3.44
Plant & Machinery	16.51	14.86	13.37	12.04	10.83	9.75	8.77	7.90
Depreciation	1.65	1.49	1.34	1.20	1.08	0.97	0.88	0.79

Depreciated value	14.86	13.37	12.04	10.83	9.75	8.77	7.90	7.11
Other Fixed Assets	0.80	0.68	0.58	0.49	0.42	0.35	0.30	0.26
Depreciation	0.12	0.10	0.09	0.07	0.06	0.05	0.05	0.04
Depreciated value	0.68	0.58	0.49	0.42	0.35	0.30	0.26	0.22
All Assets	22.49	20.46	18.63	16.97	15.47	14.11	12.88	11.77
Depreciation	2.03	1.83	1.66	1.50	1.36	1.23	1.11	1.01
Depreciated value	20.46	18.63	16.97	15.47	14.11	12.88	11.77	10.76

2.15 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)	33.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Recurring cost (Rs. in Lakh)	2.96	79.54	89.25	101.44	119.57	131.66	131.66	131.66	
Total cost (Rs. in Lakh)	36.80	79.54	89.25	101.44	119.57	131.66	131.66	131.66	821.59
Benefit (Rs. in Lakh)	0.00	247.50	292.50	337.50	337.50	337.50	337.50	337.50	
Total Depreciated value of all assets (Rs. in Lakh)								10.76	
Total benefits (Rs. in Lakh)	0.00	247.50	292.50	337.50	337.50	337.50	337.50	348.26	2238.26
Benefit-Cost Ratio (BCR): (Highly Profitable project)	**2.724**								
Net Present Worth (NPW):	1416.67								

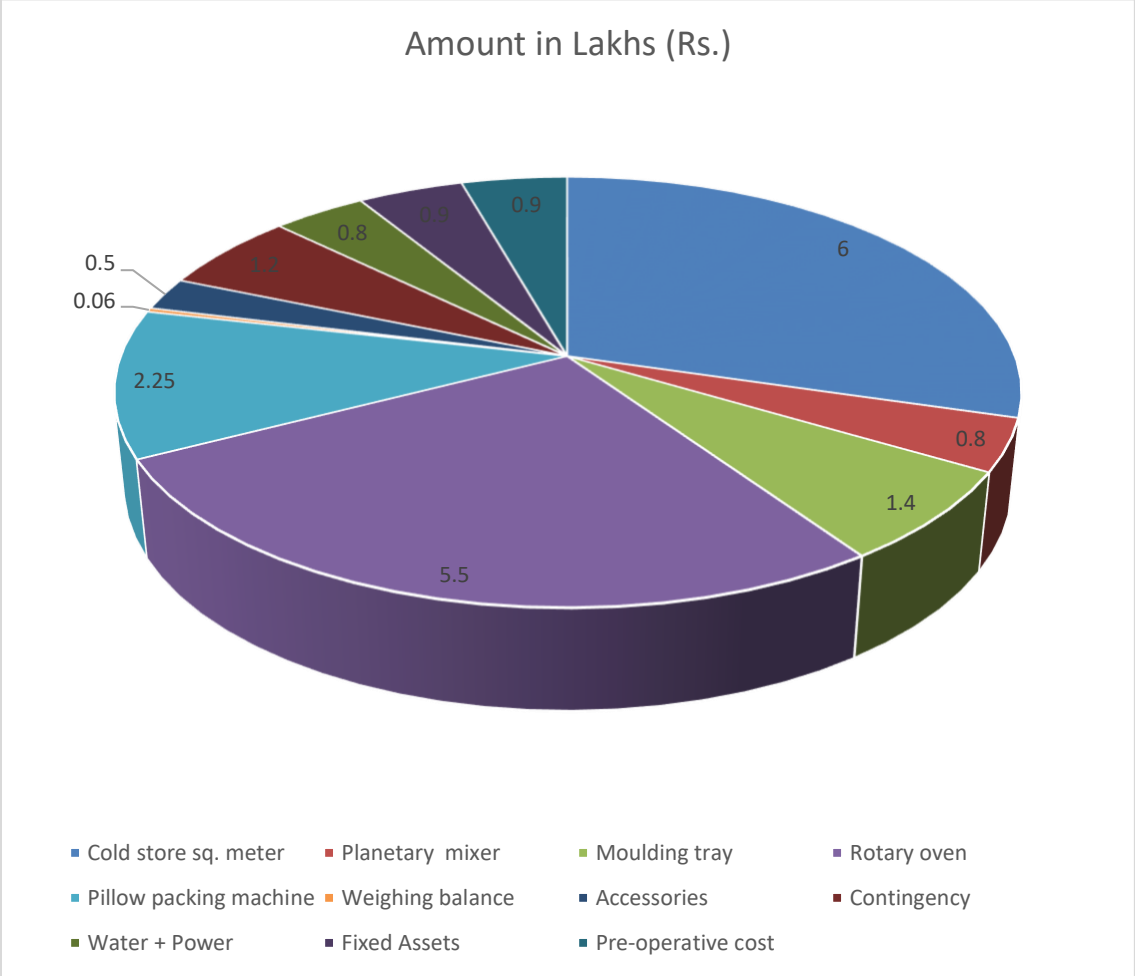
2.16 BREAK EVEN ANALYSIS

Break even analysis indicates costs-volume profit relations in the short run. This is the level at which, the firm is in no loss no profit situation.

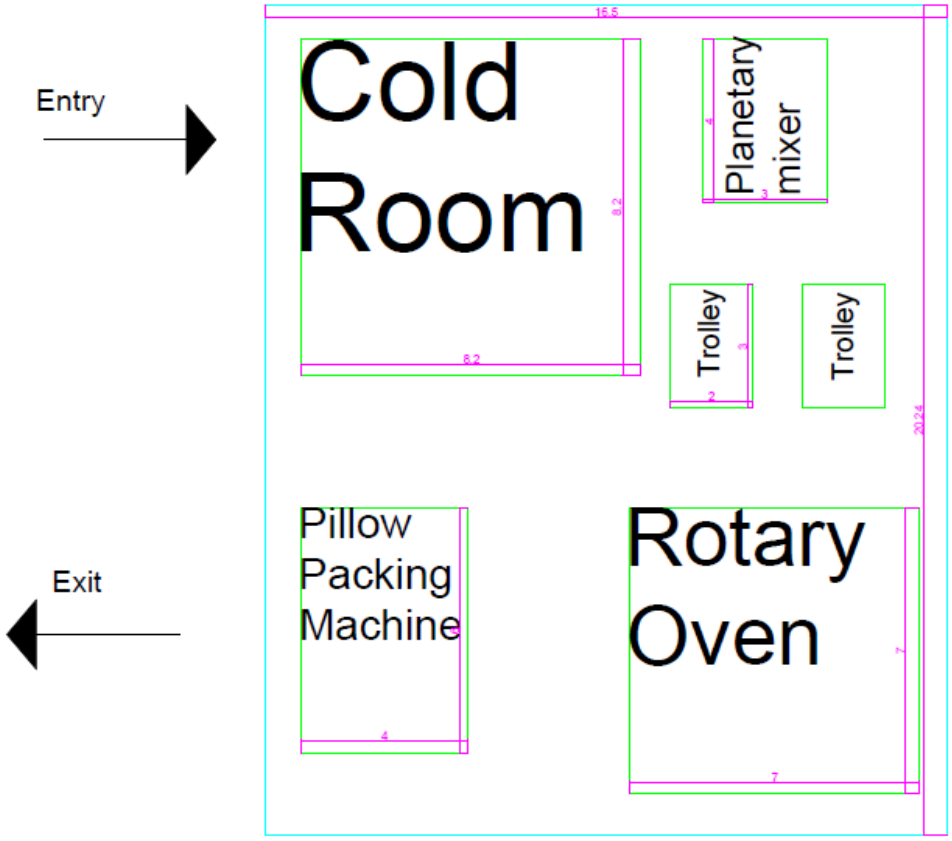
Particulars	1st Year	2nd year	3 rd year	4th year	5th year	6th year	7th year	8th year
Capacity utilization (%)	Under Const.	55%	65%	75%	90%	100%	100%	100%
Production MT/Annum		82.5	97.5	112.5	135	150	150	150
Fixed Cost (Rs. in Lakh)								
Permanent staff salaries	7.284	7.284	7.284	7.284	7.284	7.284	7.284	7.284
Depreciation on building @ 5% per annum	0.26	0.25	0.23	0.22	0.21	0.20	0.19	0.18
Depreciation on machinery @ 10% per annum	1.65	1.49	1.34	1.20	1.08	0.97	0.88	0.79
Depreciation on other fixed assets @ 15% per annum	0.12	0.10	0.09	0.07	0.06	0.05	0.05	0.04
Interest on term loan	1.65	1.60	1.53	1.46	1.39	1.30	1.21	1.10
Insurance	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Total Fixed Cost (Rs. in Lakh)	**11.26**	**11.01**	**10.77**	**10.54**	**10.32**	**10.11**	**9.90**	**9.69**
Sales Revenue (Rs. in Lakh)	**0**	**247.5**	**292.5**	**337.5**	**337.5**	**337.5**	**337.5**	**337.5**
Variable Cost (Rs. in Lakh)								
Carrot (Av. Price @ Rs.15/Kg)	0.00	0.84	0.99	1.14	1.37	1.53	1.53	1.53
Maida @ 25 per kg	0.00	3.68	4.34	5.01	6.01	6.68	6.68	6.68
Sugar @ 35 per kg	0.00	6.85	8.10	9.34	11.21	12.46	12.46	12.46
Fat @ 90 per kg	0.00	17.62	20.82	24.03	28.83	32.03	32.03	32.03

Egg @ 80 per kg	0.00	17.64	20.85	24.06	28.87	32.08	32.08	32.08
Other ingredients	0.00	8.77	10.36	11.95	14.34	15.94	15.94	15.94
Packaging materials	0.00	12.38	14.63	16.88	20.25	22.50	22.50	22.50
Casual staff salaries	0.00	5.78	5.78	5.78	5.78	5.78	5.78	5.78
Utilities (Electricity, Fuel)	0.00	1.19	1.40	1.62	1.94	2.16	2.16	2.16
Repair & maintenance	0.00	0.70	0.80	0.90	0.90	0.90	0.90	0.90
Miscellaneous expenses	0.50	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Interest on working capital @ 12%	0.00	3.01	3.01	3.01	3.01	3.01	3.01	3.01
Total Variable Cost (Rs. in Lakh)	**0.50**	**80.45**	**93.09**	**105.72**	**124.53**	**137.07**	**137.07**	**137.07**
Break Even Point (BEP)								
as % of sale	-	12.00	10.00	8.00	8.00	7.00	7.00	6.00
Break Even Point (BEP) in terms of sales value (Rs. in Lakhs)	-	29.70	29.25	27.00	27.00	23.63	23.63	20.25

2.17 PIE CHART FOR BETTER UNDERSTANDING OF EXPENSES OF EACH HEAD:



2.18 TYPICAL CARROT CAKE MANUFACTURING UNIT LAYOUT



2.19 MACHINERY SUPPLIERS

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

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

3. LIMITATIONS OF MODEL DPR & GUIDELINES FOR ENTREPRENEURS

3.1 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.

3.2 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.

Contact Us

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