

PM Formalization of Micro Food Processing Enterprises Scheme

DETAILED PROJECT REPORT FOR PEACH JUICE PROCESSING



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1. THE PROJECT AT A GLANCE

1	Name of the Project	Peach Juice
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 (55, 65, 75,90 and 100% capacity utilization in the 2nd, 3rd, 4th year, 5th year and 6th year onwards respectively)
11	Raw materials	Peach
12	Major product outputs	Peach Juice
13	Total project cost (Lakhs)	27.24
	Land development, building & civil construction	4
	Machinery and equipments	16.81
	Utilities (Power & water facilities)	0.6
	Miscellaneous fixed assets	0.6
	Pre-operative expenses	0.50
	Contingencies	0.90
	Working capital margin	3.83
14	Working capital Management (In Lakhs)	
	Second Year	11.49
	Third Year	13.58
	Fourth Year	18.51
15	Means of Finance	
	Subsidy grant by MoFPI (max 10 lakhs)	9.533746702
	Promoter's contribution (min 20%)	5.447855258
	Term loan (45%)	12.25767433
16	Debt-equity ratio	2.25: 1
17	Profit after Depreciation, Interest & Tax	

	2nd year	19.34
	3rd year	24.56
	4th year	29.78
18	Average DSCR	2.16
	Benefit Cost Ratio	1.915798455
	Term Loan Payment	7 Years with 1 year grace period
	Pay Back Period for investment	2 Years

2. GENERAL OVERVIEW AND INTRODUCTION

2.1 INTRODUCTION

- ✓ India ranks second for 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.
- ✓ Peach, (*Prunuspersica*), fruit tree of the rose family (Rosaceae), grown throughout the warmer temperate regions of both the Northern and Southern hemispheres. Peaches are widely eaten fresh and are also baked in pies and cobblers; canned peaches are a staple commodity in many regions. Yellow-fleshed varieties are especially rich in vitamin A.
- ✓ The specific name *persica* refers to its widespread cultivation in Persia (modern-day Iran), from where it was transplanted to Europe. It belongs to the genus *Prunus*, which

includes the cherry, apricot, almond, and plum, in the rose family. The peach is classified with the almond in the subgenus *Amygdalus*, distinguished from the other subgenera by the corrugated seed shell. Due to their close relatedness, the kernel of a peach stone tastes remarkably similar to almond, and peach stones are often used to make a cheap version of marzipan, known as persipan.

2.2 ORIGIN, DISTRIBUTION AND PRODUCTION OF PEACH

- ✓ Peaches originated in China where they were cultivated since the early days of Chinese culture. Considered the favorite fruit of emperors, peaches were first mentioned in Chinese writings dating back to the 10th century. From China, the “Persian apple,” the translated Latin name, was introduced to the Romans by the Persians (now Iranians) and later introduced to Europe by Alexander the Great.

- ✓ Spanish explorers are credited with bringing the peach to South America and then eventually to England and France where it became quite a popular, but rare, treat. During Queen Victoria’s reign, it is written that no meal was complete without a fresh peach presented in a fancy cotton napkin.

- ✓ The peach probably originated in China and then spread westward through Asia to the Mediterranean countries and later to other parts of Europe. The Spanish explorers took the peach to the New World, and as early as 1600 the fruit was found in Mexico. For centuries the cultivation and selection of new varieties of peaches were largely confined to the gardens of the nobility, and large-scale commercial peach growing did not begin until the 19th century, in the United States. The early plantings were seedling peaches, inevitably variable, and often of poor quality. The practice of grafting superior strains

onto hardy seedling rootstocks, which came later in the century, led to the development of large commercial orchards.

2.3 VARIETIES

- ✓ More than 300 varieties of peaches (*Prunus persica*) grow and flourish in the United States, and over 2,000 varieties globally, although the fruit is native to China. Peaches are classified in three groups: freestone, clingstone and semi-freestone. The classifications refer to the way the fruit's flesh clings to the pit. Popular varieties grown in U.S. Department of Agriculture hardiness zones 8 through 10 include Santa Rosa, Red Beauty, Red Top, Elegant Lady and O'Henry.

Clingstone

- ✓ The clingstone class of peaches are so named because the fruit flesh clings securely to the pit. Clingstone varieties ripen between May and August, and have yellow flesh that turns mild red to bright red close the pit. Clingstones have a soft texture, high sugar content and a juiciness that makes them ideal to eat as a snack and to incorporate in desserts such as Peach Melba. Varieties of clingstone peaches include Santa Rosa and Red Beauty.

Clingstone Variants

- ✓ Juicy Santa Rosa peaches have delicate yellow flesh and a slight acidity that contrasts their sweetness. Santa Rosas, in season from May to August, are primarily used for canning and preserving, but can also be incorporated in salads and baked dishes thanks to their firmness and crisp bite. Red Beauty peaches, also in season from May to August, have tender, reddish-to-yellow flesh and a skin of near crimson that gives them their name.

Freestone

- ✓ The freestone classification refers to peaches with flesh that removes easily from the pit. Like clingstone varieties, freestones are good to eat fresh as a snack. However, their firm texture, relatively low level of juiciness and mild sugar content make them ideal for baking purposes; they do not mask other flavors and maintain much of their firmness when exposed to heat. You can harvest freestone varieties between late May and October. Freestone varieties include O’Henry, Elegant Lady and Red Top.

Freestone Variants

- ✓ O’Henry peaches, a late-summer variety, are widely regarded for their firm yellow flesh and thin, evocative red skin. They also have a sweetness balanced with an acidity that contributes to their aroma. Culinary uses for the O’Henry include mixed drinks, out-of-hand eating, sorbets and preserves. Red Top peaches, also a late-summer variety, are known for their fragrant leaves, pink flowers and mildly sweet -- yet mildly tart -- flavor. Their tannic acid content causes the tartness. Elegant Lady peaches are prized for their fragrance, firmness and mild acidity. People use the the Elegant Lady peach for canning, snacking and baking.

Semi-Freestone

- ✓ Semi-freestone peaches are a cross-hybrid of clingstone and freestone varieties. Semi-freestones combine two of the most prized qualities of clingstones and freestones -- a relatively high sugar content and juiciness along with flesh that doesn’t cling to the pit.

3. HEALTH BENEFITS AND NUTRITIONAL INFORMATION

3.1 Health benefits

- ✓ Peaches are low in calories (100 g just provide 39 calories), and contain no saturated fats. Nonetheless, they are packed with numerous health promoting compounds, minerals, and vitamins. Fresh peaches are a moderate source of antioxidants and vitamin C which is required for the building of connective tissue inside the human body. Consumption of foods that are rich in vitamin C helps a person develop resistance against infections and helps to eliminate harmful free radicals that cause certain.
- ✓ Fresh fruits are a moderate source of vitamin-A and beta-Carotene. Beta-Carotene is a pro-vitamin, which converts into vitamin A inside the body. Vitamin A is essential for prevention of night vision issues and for maintaining healthy mucus membranes and healthy skin. Consumption of fruits like peaches that are rich in vitamin A, are known to offer protection from lung and oral cancers. They contain many vital minerals such as potassium, fluoride and iron.
- ✓ Potassium is an important component of cell and body fluids that help regulate heart rate and blood pressure. Fluoride is a component of bones and teeth and is essential for prevention of dental caries. Iron is required for red blood cell formation.
- ✓ So, make sure you are taking small steps to eat sufficient fruit each day. Peaches are now in season across much of the United States are healthy and contain health promoting flavonoid polyphenolic antioxidants including lutein, zeaxanthin and beta-cryptoxanthin. These compounds help to act as protective scavengers against free radicals and play a role in promoting healthy aging and reduction of various disease processes.

Get [some peach recipes](#) from New Jersey's best chefs & the New Jersey Peach Festival Association

3.2 Nutritional Information Table

Peach Nutrition :- Values per 100 gm. (Source – USDA national Nutrient data base).

Principle	Nutrition Value	% RDA
Energy	39 Kcal	2 %
Carbohydrates	15 g	13 %
Protein	1 g	2 %
Sugar	8 g	--
Dietary Fibre	2 g	5 %
Vitamins		
Niacin	0.850 mg	6%
Vitamin E	--	5%
Vitamin K	--	5 %
Vitamin A	340 IU	7%
Vitamin C	7 mg	11%
Electrolytes		
Copper	5 mg	8%
Potassium	382 mg	8%
Minerals		
Manganese	0.120mg	5%

3.3 CONSTITUENTS AND HEALTH BENEFITS OF PEACH

Peaches do not contain a significant amount of any nutrient. However, a cup of diced peach provides 11.1 milligrams (mg) of vitamin C, as well as contributing to the recommended daily allowance (RDA) of potassium, fiber, and iron.

This amount of vitamin C equates to 12.33% of the RDA for an adult male and 14.80% of the RDA for an adult female, according to guidelines from the United States Department of Agriculture (USDA).

Despite their relatively low nutrient profile, peaches can still benefit people's health as part of a balanced diet that includes many fruits and vegetables. Peaches can add sweetness to desserts and treats, replacing more harmful added sugars.

Reducing cancer risk

Peaches provide a significant amount of vitamin C. This vitamin is a powerful antioxidant that can help prevent the formation of free radicals, which are compounds that have links to cancer development.

As a result, adequate vitamin C intake may help a person reduce their risk of cancer. However, exposure to other risk factors, such as smoking, increases the amount of vitamin C that a person needs to have a significant effect on cancer risk.

Preserving skin health

Research suggests that regularly consuming vitamin C can improve the appearance and health of the skin.

This powerful antioxidant plays a vital role in forming collagen. Collagen acts as the support system for the skin, promoting wound healing and enhancing skin strength.

A review of studies found that supplementing vitamin C in the diet improved at least one factor of actual or perceived skin appearance, including wrinkling, elasticity, roughness, and coloring.

Contributing to fiber intake

A cup of diced peaches contains 2.52 g of fiber. The USDA recommend 22.4–28.0 g per day for female adults and 30.8–33.6 g each day for male adults, meaning that this serving size can provide at least 7.5% of a person's recommended daily fiber intake.

Fiber-rich foods provide a range of important health benefits, according to a review. They can protect the health of the colon, support weight management on a long term basis, and reduce the risk of several harmful health conditions.

These health conditions include cardiovascular disease, type 2 diabetes, and several cancers, including colorectal cancer and lung cancer.

A person could significantly boost their fiber intake by replacing sweet, low fiber treats with a peach or two every day.

The benefits of consuming fruits and vegetables are considerable. As plant food consumption increases, the risk of many lifestyle-related diseases, including obesity, diabetes, and heart disease, reduces.

A diet containing plenty of fruits and vegetables can also reduce the risk of overall mortality.

Topping up potassium intake

Potassium is an essential electrolyte that helps cells function. It can also help reduce the risk of high blood pressure, stroke, and kidney stones, according to the Office of Dietary Supplements (ODS).

A cup of diced peach provides 319 mg of potassium, which is 6.8% of the recommended 4,700 mg daily intake for adults.

Peaches are not among the top dietary sources of potassium. However, they can still play a role in helping a person manage their risk of chronic disease as part of a healthful diet plan.

Iron supplementation

Iron is a vital component of hemoglobin, which helps the blood transport oxygen throughout the body. Without enough hemoglobin, a person might experience iron deficiency anemia.

According to the American Society of Hematology, this can lead to severe fatigue, pale skin, and shortness of breath, among other symptoms.

A cup of diced peach provides 0.42 mg of iron, which accounts for at least 2.3% of an adult's daily iron requirement, depending on age and sex.

Peaches alone will not provide enough iron to keep iron deficiency anemia at bay. However, people can include them in the diet alongside foods that contain more iron, such as raisins, cashew nuts, or spinach.

4. CULTIVATION, BEARING & POST HARVEST MANAGEMENT

Small to medium-sized, peach trees seldom reach 6.5 metres (21 feet) in height. Under cultivation, however, they are usually kept between 3 and 4 metres (10 and 13 feet) by pruning. The leaves are glossy green, lance-shaped, and long pointed; they usually have glands at their bases that secrete a fluid to attract ants and other insects. The flowers, borne in the leaf axils, are arranged singly or in groups of two or three at nodes along the shoots of the previous season's growth. The five petals, usually pink but occasionally white, five sepals, and three whorls of stamens are borne on the outer rim of the short tube, known as the hypanthium, that forms the base of the flower

The leaves of the peach tree are simple, alternate, serrated, lanceolate, 7–15 centimeters (cm) long, and 2–3 cm broad. The flowers are produced in early spring before the leaves; they are solitary or paired, 2.5–3 cm in diameter, white to lavender, with five petals.

The peach fruit has a single large seed encased in hard wood (called the "stone" or "pit"). The seed is red, oval shaped and 1.5-2 cm thick. The fruit has yellow or whitish flesh with a

delicate aroma and a velvety skin that bruises easily. Peaches, along with cherries, plums, and apricots, are classified as stone fruits or drupes.

Cultivation and Bearing:-

Peach trees grow very well in a fairly limited temperate range. They have a chilling requirement of 33-45 degrees Fahrenheit that subtropical areas cannot satisfy, and on the other hand are susceptible to frost damage. Most U.S. cultivars require 750 to 1,000 hours of chilling in order for the trees to bloom and grow properly.

The trees themselves can usually tolerate temperatures to around -26°C to -30°C , although the following season's flower buds are usually killed at these temperatures, leading to no crop that summer. Flower bud kill begins to occur at temperatures between -15°C and -25°C depending on the cultivar and the timing of the cold, with the buds becoming less cold tolerant in late winter (Szalay et al. 2000). Certain cultivars are more tender and others can tolerate a few degrees more cold.

In addition, a lot of summer heat is required to mature the crop, with mean temperatures of the hottest month between 20°C and 30°C .

A problematic issue in many peach-growing areas is spring frost. The trees tend to bloom fairly early in spring, around the same time as daffodils. The blossoms can often be damaged or killed by freezes. If temperatures drop below about -4°C , most blossoms will be killed. However, if the blooms are not fully open, they can tolerate a couple degrees colder temperature.

Most peach trees sold by nurseries are grafted cultivars.

Diseases

The most important bacterial disease is bacterial spot, which affects the fruit, leaves, and twigs. Planters should try to select a variety that has a high resistance, such as Derby, Pekin, Clayton, and Biscoe. Certain varieties are very susceptible, such as Sunglo, Summer Pearl, Monroe, and Redgold.

Many funga diseases affect peaches: peach leaf curl, rhizopus rot, brown rot, and peach scab.

One virus, transmitted by nematodes, is known as stem-pitting virus. Other diseases caused by viruses include peach yellows, X-disease, Western X-disease, ring spot, and peach mosaic. These infected trees need to be uprooted and destroyed (World Book 1999).

Several species of mites will attack the foliage resulting in defoliation and abnormal fruit.

Many insects attack peach trees. White peach scale, *Pseudaulacaspis pentagona*, destroyed an entire orchard of 10,000 trees in Georgia. Stink bugs (family Pentatomidae) and lygus bugs (family Miridae) are sucking insects that attack the fruit and can cause it to drop prematurely or be misshapened.

Peach tree borer (family Sesiidae) is considered by some to be one of the most destructive insects of peaches. They feed under the bark and are attracted to trees that are already diseased or stressed in some way. When a tree shows evidence of brown frass or brown gum around the trunk, this is symptomatic of a borer attack.

Oriental fruit moths (family Tortricidae) attack trees bearing stone fruits. They cause the shoots to die at the terminal or tip.

The plum curculio (family Curculionidae), is a weevil that lays its eggs in the fruit of the peach, as well as many other types of fruit. They may attack the fruit at any time up to about two weeks before harvest.

Another disease, of unknown origin, is called "peach tree short life" disease or PTSL. Different rootstocks are being developed to provide protection.

Planting

It is possible to grow a tree from either a peach or nectarine seed. The germinated seed requires a south or west-facing position and regular watering.

Peaches should be located in full sun with good air flow. This allows cold air to flow away on frosty nights and keeps the area cool in summer. Peaches are best planted in early winter, as this allows time for the roots to establish and be able to sustain the new spring growth. When planting in rows, plant north-south. Trees are typically planted 6 to 8 meters apart to give 108 to 180 trees per acre.

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.
- Peaches require a temperature of 7 to 8°C and humidity of 85-90% such that they can be stored for 4 – 8 weeks.
- 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 puncture marks from Fingernails and jewellery;
- 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 Litchis. The boxes or baskets have to be ventilated and the fruits should be wrapped in tissue paper or newspaper for protection.

5. PROCESSING & VALUE ADDITION:-

✓ Fruit beverages and drinks are one of the popular categories of beverages that are consumed across the globe. The fruit beverages and drinks are easily digestible, highly refreshing, thirst quenching, appetizing and nutritionally far superior to most of the synthetic and aerated drinks. In recent past the consumption of fruit based beverages and drinks has increased at a fast rate. FruitBeverages or pulp used for the preparation of these products are subjected to minimal processing operations like filtration, clarification and pasteurization. The fruit Beverages or pulp, are mixed with ingredients like sugar, acid, stabilizers, micronutrients and preservative to develop beverages and drinks. The principle groups of fruit beverages are as follows:

- Ready-to-Serve (RTS) pre-packaged Beverages
- Fruit Beverages and Nectars
- Dilutable beverages
- Dried fruit chips

- Jams
- Jellies
- Marmaleads

6. MANUFACTURING PROCESS OF THE PEACH JUICE

- ✓ Beverages are essential for growth, development as well for carrying out various physiological processes that are critical for living a healthy life. In adult individuals 70 percent of body weight, 73 percent of lean muscle, 25 percent of adipose tissues, 22 percent of bone and 80 percent of blood consists of water. Consumption of beverages help in maintaining the water content in body and prevent dehydration.
- ✓ The water assists in digestion, assimilation and excretion of foods. It also helps in removing the toxic substances produced in body as a result of metabolisms such as urea, uric acid, ammonia etc. through kidney. Water in beverages help in regulating the temperature of body through the process of sweating. Beverages specially the fruit and vegetable based ones are source of micronutrients (vitamins and minerals) and antioxidants (carotenoids, flavonoids).
- ✓ The ready-to-serve beverages as per FSSAI specifications should contain at least 10% fruit content and not less than 10 % TSS besides 0.3% acid maximum as citric acid. The levels of permitted preservatives include 70 ppm (maximum) for sulphur dioxide and 120 ppm (maximum) for benzoic acid. The total plate count and yeast and mold counts should not exceed, to 50.0 cfu/ml and 2.0 cfu/ml, respectively. The Coliform counts should be nil in 100 ml beverage samples. Since these beverages are consumed as such without dilution, hence are termed as Ready-to-serve beverage. The majority of packaged fruit beverages belong to this category.

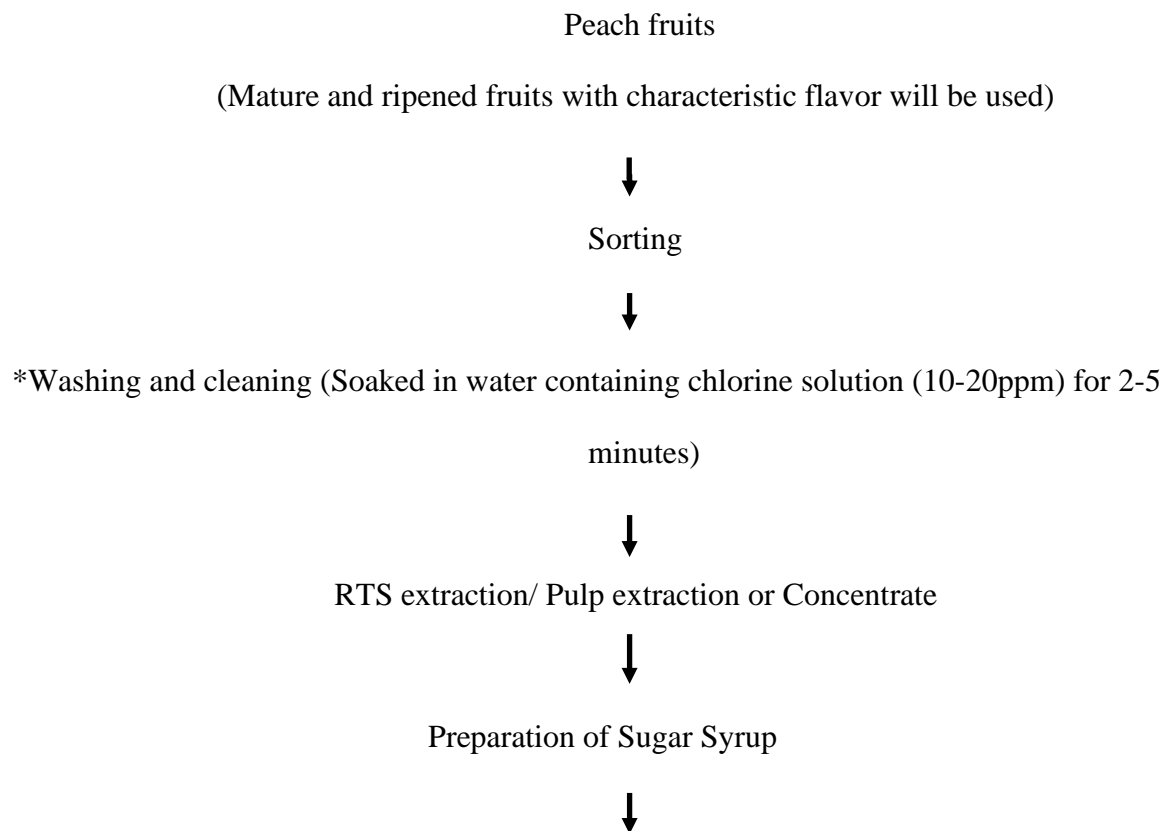
- ✓ The amount of fruit Beverages or pulp may vary according to fruit and cost effectiveness. The presence of oxygen in headspace often leads to oxidation resulting in off-flavour and loss of nutritive value, hence anti-oxidants such as ascorbic acid is often added in Beverages. Besides it, colour and flavour ingredients which are stable to heat and oxygen are preferred.
- ✓ RTS and Beverages products represent a very important segment of the total processed fruit industry. Beverages products are being marketed as refrigerated, shelf-stable, and frozen, in a variety of packages with increased emphasis on functionality, health attributes, new flavours or blends, and in some cases fortified with vitamins and minerals. High-quality Beverages operations are dependent upon a source of high-quality raw material. Most fruit Beverages are excellent sources of vitamin C, several are good sources of carotene and many contain moderate amounts of pyridoxine, inositol, folic acid and biotin. Fruit Beverages is regarded as source of energy due to their rich carbohydrate content. The organic acids present in the fruit Beverages plays a significant role in the maintenance of the acid-base balance in the body.
- ✓ The process starts with sound fruit, freshly harvested from the field or taken from refrigerated or frozen storage. Thorough washing is usually necessary to remove dirt and foreign objects and may be followed by a sanitation step to decrease the load of contaminants. Sorting to remove decayed and mold contaminated fruit is necessary to make sure that the final Beverages will not have a high microbial load, undesirable flavours, or mycotoxin contamination. For most fruits, preparation steps such as pitting and grinding is required prior to Beverages extraction. Heating and addition of enzymes might also be included before the mash is transferred to the extraction stage. Beverages extraction can be performed by pressing or by enzymatic treatment followed by decanting. The extracted Beverages will then be treated according to the characteristics of the final product.
- ✓ For cloudy Beverages, further clarification might not be necessary or may involve a coarse filtration or a controlled centrifugation to remove large insoluble particles. For

clear Beverages, complete de-pectinization by addition of enzymes, fine filtration, or high speed centrifugation is required to achieve visual clarity. The next step is usually a heat treatment or equivalent non-thermal process to achieve a safe and stable Beverages and final packaging if single-strength Beverages is being produced.

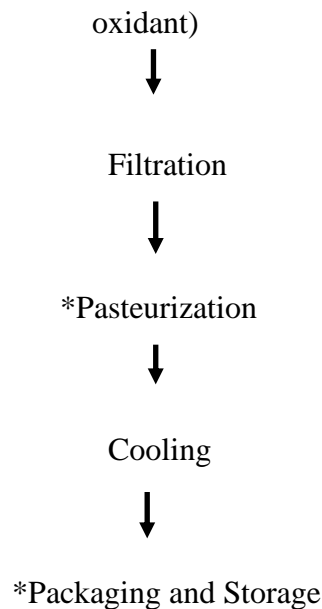
- ✓ For a concentrate, the Beverages is fed to an evaporator to remove water until the desired concentration level is obtained. Other processes used for water removal include reverse osmosis and freeze concentration, which are best suited for heat-sensitive Beverages. The concentrate is then ready for final processing, packaging, and storage.

6.2 Flow Chart for Peach Juice Manufacturing

The typical Procedure for manufacturing of Peach Ready to Serve is as below:



Mix (Sugar Syrup, Acidity regulator, emulsifier, preservative, coloring, flavoring agent, anti-



7. 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 Peach RTS manufacturing unit are in the production clusters of Peach growing states. Where adequate quantities of surplus raw materials can be available for processing.
- ✓ However, in other states of India multi fruit & other variants based beverage unit along with Peach as one of the raw materials can be established.

8. MARKET DEMAND AND SUPPLY FOR PEACH BASED PRODUCTS

- The fruit based products 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.
- Peach Juice & Other products if highlighted properly for all these health benefits can occupy significant cold products market.
- The global **Beverage** value is expected to reach USD 89.5 billion by 2023, recording an anticipated CAGR of 4.9% during the forecast period (2018-2023).... Unilever dominates the global **market** occupying eight of the 15 top selling brands and a 22% share in the **market**.
- Only thing to be done over here is to replace the existing products with peach juices & other beverages with proper demonstration.

9. MARKETING STRATEGY FOR PEACH JUICE.

- ✓ **Marketing strategy** is a long-term, forward-looking approach and an overall game plan of any organization or any business with the fundamental goal of achieving a sustainable competitive advantage by understanding the needs and wants of customers.
- ✓ 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 Peach Based Juices.

10.DETAILED PROJECT ASSUMPTIONS

Parameter	Assumption	
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Capacity of the peach juice mfg. Unit	150	MT/annum
Utilization of capacity	1st Year Implementation, 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	50	
Average sale prices per Kg	80	Rs/kg
Pulp extraction	75	
peach Juice	1 Kg Peach Juice from 0.264 kg Peach fruit	

Seven year with one year grace period is considered.

- ✓ This model DPR for manufacturing 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 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. Peach cost considered @ Rs. 50/- per kg.
 2. Sugar Cost considered @ Rs. 32/- per kg.
 3. Milk cost considered @ Rs. 45/- per kg.
 4. Peach pulp yield from raw fruit to processed pulp is considered as 75 %, which may vary depend on degree of ripening & Size of the fruit., and Fruit purchase is assumed

as a bulk & in that 10% approx. will be eliminated as a rejection due to over ripened, decayed, diseased, rotten etc.

5. Machinery cost may also vary from vendor to vendor.

- ✓ Land and civil infrastructures are assumed as already available with the entrepreneurs.
- ✓ We took less sugar content as fruit is itself more sweet, cost can be reduced by increasing sugar content.

11. PROJECT START-UP COSTING SHEETS

Land and Building.

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

Still we have considered approx. 4 lac Rs. as a construction cost for safer side of the entrepreneur.

Machinery and Equipment :- Rs. 16.81 Lacs

Sr. No	Equipment	Capacity	Quantity	Power KW	Area	Amount (in Lakhs)
1	Cold store sq. meter	1500 Kg	1	4	3 m*2.5 m* 3m	6
2	Washing station	100 kg/hr	1	2	2.5 Sq. Mtr.	0.4
3	Pulping machine	100 kg/hr	1	1.5	1.5 Sq. Mtr	1
4	Sugar Syrup Preparation tank	100 Liters	1	1	0.8 m Dia	1
5	Mixing/Blending tank	100 Liters	1	1	0.8 m Dia	0.65
6	Filter press	100 Liters	1	0.4	1.2 Sq. Mtr.	0.6
7	Homogenizer	100 Liters/hr	1	1.5	4.7 Sq. Mtr.	2.3
8	Pasteurizer (PHE)	100 Liters/hr	1	3	2 Sq. Mtr.	1.6
9	Filling & Capping	500 BPM	1	1.5	8 Sq. Mtr.	2.7
10	Weighing balance	Suitable	1			0.06
11	Accessories	Suitable	1			0.5

	TOTAL					16.81
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Other costs:-

Utilities and Fittings:-

Utilities and Fittings	
1. Water	Rs. 0.6 Lacs total
2. Power	

Other Fixed Assets:-

Other Fixed Assets	
1. Furniture & Fixtures	Rs. 0.6 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.	0.5 LAC
Total preoperative expenses	0.5 LAC

Contingency cost to be added as approx. 0.9 Lac.

So total start up cost at own land & Premise may be somewhat similar to **19.41 lacs**. This is according to survey done at X location India. This may vary on location, situation and design change over.

Working capital requirement (in lacs)

		55%	65%	75%
Particulars	Period	Year 2	Year 3	Year 4
Raw material stock	15 days	1.46	1.73	2.36
Work in progress	15 days	2.93	3.46	4.72
Packing material	15 days	0.90	1.06	1.45
Finished goods' stock	15 days	2.95	3.49	4.75
Receivables	30 days	5.90	6.97	9.51
Working expenses	30 days	1.17	1.38	1.89
Total current assets		15.32	18.10	24.68
Trade creditors		0.00	0.00	0.00
Working capital gap		15.32	18.10	24.68
Margin money (25%)		3.83	4.53	6.17
Bank finance		11.49	13.58	18.51

12.INSTALLED CAPACITY OF THE PEACH JUICE MANUFACTURING UNIT

The maximum installed capacity of the Peach juice manufacturing unit in the present model project is proposed as 150 tons/annum or 500 kg/day Peach Juice manufacturing. 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 55 percent capacity, 3rd year 65 percent capacity and 4th year onwards 75 percent capacity utilization is assumed in this model project.

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

Particulars	Amount in Lakhs
-------------	-----------------------

i. Land and building (60 x 32 x 12 ft - LxBxH)	4
ii. Plant and machinery	16.81
iii. Utilities & Fittings	0.6
iv. Other Fixed assets	0.6
v. Pre-operative expenses	0.50
vi. Contingencies	0.90
vii. Working capital margin	3.83
Total project cost (i to vii)	27.24
Means Of finance	
i. Subsidy	9.53
ii. Promoters Contribution	5.45
iii. Term Loan (@10%)	12.26

Manpower Requirement

Total Monthly Salary (Rs.)	No	Wages	Total Monthly
Supervisor (can be the owner)	1	15000	15000
Technician	1	12000	12000
Semi skilled	2	7600	15200
Helper	1	5500	5500
Sales man	1	8000	8000
		Total	55700

13.EXPENDITURE, REVENUE & PROFITABILITY ANALYSIS.

	Particulars	1st Year	2nd Year	3rd Year	4th Year	5th year	6th year
A	Total Installed Capacity (MT)	39.6 MT Peach/Annu m	82.5	97.5	112.5	135	150
	Capacity utilization (%)	Under Const.	55%	65%	75%	90%	100%
B	Expenditure (Rs. in Lakh)	0					
	Peach(Av. Price @ Rs. 50/Kg)	0.00	10.89	12.87	14.85	17.82	19.80
	Sugar @ Rs. 35/kg	0.00	2.89	3.41	3.94	4.73	5.25

	Citric Acid @ Rs. 80/Kg	0.00	0.10	0.12	0.14	0.16	0.18
	Other materials @ 300/kg	0.00	0.20	0.23	0.27	0.32	0.36
	Packaging materials	0.00	9.90	11.70	13.50	16.20	18.00
	Utilities (Electricity, Fuel)	0.00	1.66	1.96	2.26	2.71	3.01
	Salaries (1st yr only manager's salary)	1.80	6.43	6.43	6.43	6.43	6.43
	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	2.60	35.36	40.12	44.88	51.87	56.53
C	Total Sales Revenue (Rs. in Lakh)	0.00	66.00	78.00	90.00	108.0	120.0
	Sale of Peach Juice (Av. Sale Price @ Rs.100/kg)	0.00	66.00	78.00	90.00	108.0	120.0
						0	0
D	PBDIT (Total exp.-Total sales rev.) (Rs. in Lakh)/Cash Inflows	-2.60	30.64	37.88	45.12	56.13	63.47
	Depreciation on civil works @ 5% per annum	0.20	0.19	0.18	0.17	0.16	0.15
	Depreciation on machinery @ 10% per annum	1.68	1.51	1.36	1.23	1.10	0.99
	Depreciation on other fixed assets @ 15% per annum	0.09	0.08	0.07	0.06	0.05	0.04
	Interest on term loan @ 12%	1.27	1.23	1.18	1.13	1.07	1.00
	Interest on working capital @ 12%	0.00	1.38	1.63	2.22	2.22	2.22
E	Profit after depreciation and Interest (Rs. in Lakh)	-5.85	27.63	35.09	42.54	53.75	61.28
F	Tax (assumed 30%) (Rs. in Lakh)	0.00	8.29	10.53	12.76	16.12	18.38
G	Profit after depreciation, Interest & Tax (Rs. in Lakh)	-5.85	19.34	24.56	29.78	37.62	42.89
H	Surplus available for repayment (PBDIT-Interest on working capital-Tax) (Rs. in Lakh)	1.27	1.23	1.18	1.13	1.07	1.00
I	Coverage available (Rs. in Lakh)	1.27	1.23	1.18	1.13	1.07	1.00
J	Total Debt Outgo (Rs. in Lakh)	0.43	0.47	0.52	0.57	0.63	0.70
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)	-3.87	21.12	26.17	31.23	38.94	44.08
M	Payback Period	2.5 Years					
	(on Rs. 27.24 Lakhs initial investment)						

14. REPAYMENT SCHEDULE

Year	Beginning	PMT	Interest	Principal	Ending Balance
1	1,225,767.43	170,037.46	127,479.81	42,557.64	1,183,209.79
2	1,183,209.79	170,037.46	123,053.82	46,983.64	1,136,226.15
3	1,136,226.15	170,037.46	118,167.52	51,869.94	1,084,356.21
4	1,084,356.21	170,037.46	112,773.05	57,264.41	1,027,091.80
5	1,027,091.80	170,037.46	106,817.55	63,219.91	963,871.89
6	963,871.89	170,037.46	100,242.68	69,794.78	894,077.12
7	894,077.12	170,037.46	92,984.02	77,053.44	817,023.68
8	817,023.68	170,037.46	84,970.46	85,066.99	731,956.68
9	731,956.68	170,037.46	76,123.50	93,913.96	638,042.72
10	638,042.72	170,037.46	66,356.44	103,681.01	534,361.71
11	534,361.71	170,037.46	55,573.62	114,463.84	419,897.87
12	419,897.87	170,037.46	43,669.38	126,368.08	293,529.79
13	293,529.79	170,037.46	30,527.10	139,510.36	154,019.44
14	154,019.44	170,037.46	16,018.02	154,019.44	0.00
		2,380,524.39	1,154,756.96	1,225,767.43	(1,225,767.43)

15.ASSETS' DEPRECIATION

Assets' Depreciation (Down Value Method)	Amounts in Lakhs							
	1st Year	2nd year	3 rd year	4th year	5th year	6th year	7th year	8th year
Particulars								
Civil works	4.00	3.80	3.61	3.43	3.26	3.10	2.94	2.79
Depreciation	0.20	0.19	0.18	0.17	0.16	0.15	0.15	0.14
Depreciated value	3.80	3.61	3.43	3.26	3.10	2.94	2.79	2.65
Plant & Machinery	16.81	15.13	13.62	12.25	11.03	9.93	8.93	8.04
Depreciation	1.68	1.51	1.36	1.23	1.10	0.99	0.89	0.80
Depreciated value	15.13	13.62	12.25	11.03	9.93	8.93	8.04	7.24
Other Fixed Assets	0.60	0.51	0.43	0.37	0.31	0.27	0.23	0.19
Depreciation	0.09	0.08	0.07	0.06	0.05	0.04	0.03	0.03
Depreciated value	0.51	0.43	0.37	0.31	0.27	0.23	0.19	0.16
All Assets	21.41	19.44	17.66	16.05	14.60	13.29	12.10	11.03
Depreciation	1.97	1.78	1.61	1.45	1.31	1.19	1.07	0.97
Depreciated value	19.44	17.66	16.05	14.60	13.29	12.10	11.03	10.05

16.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)	27.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Recurring cost (Rs. in Lakh)	2.60	35.36	40.12	44.88	51.87	56.53	56.53	56.53	

Total cost (Rs. in Lakh)	29.84	35.36	40.12	44.88	51.87	56.53	56.53	56.53	371.67
Benefit (Rs. in Lakh)	0.00	66.00	78.00	90.00	108.00	120.00	120.00	120.00	
Total Depreciated value of all assets (Rs. in Lakh)								10.05	
Total benefits (Rs. in Lakh)	0.00	66.00	78.00	90.00	108.00	120.00	120.00	130.05	712.05
Benefit-Cost Ratio (BCR): (Highly Profitable project)	1.916								
Net Present Worth (NPW):	340.38								

17.BREAK-EVEN ANALYSIS

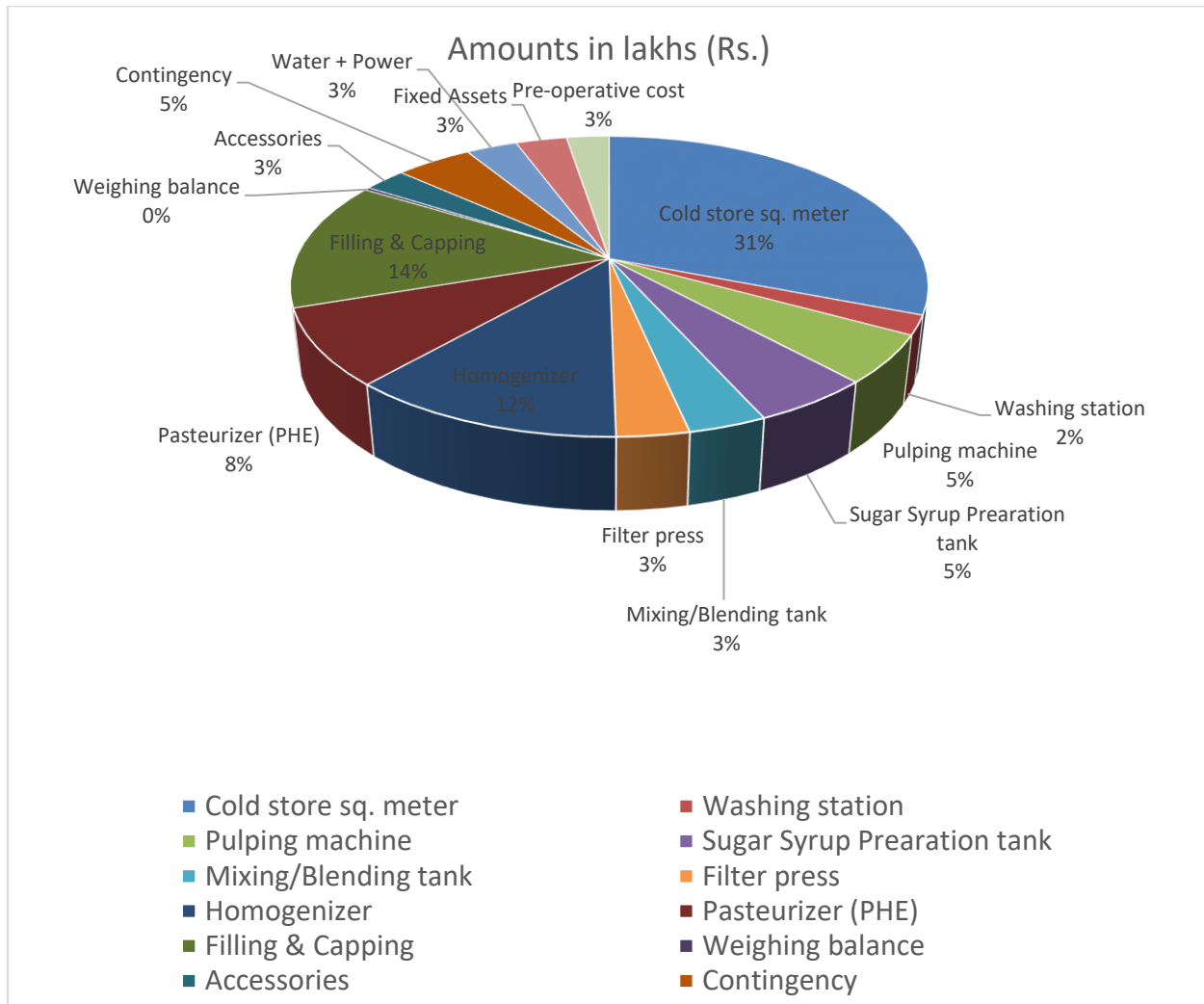
Sr. No.	Particulars	1st Year	2nd year	3 rd year	4th year	5th year	6th year	7th year	8th year
	Capacity utilization (%)	Under Const.	55%	65%	75%	90%	100%	100%	100%
	Production MT/Annum		82.5	97.5	112.5	135	150	150	150
A	Fixed Cost (Rs. in Lakh)								
	Permanent staff salaries	6.432	6.432	6.432	6.432	6.432	6.432	6.432	6.432
	Depreciation on building @ 5% per annum	0.20	0.19	0.18	0.17	0.16	0.15	0.15	0.14
	Depreciation on machinery @ 10% per annum	1.68	1.51	1.36	1.23	1.10	0.99	0.89	0.80
	Depreciation on other fixed assets @ 15% per annum	0.09	0.08	0.07	0.06	0.05	0.04	0.03	0.03
	Interest on term loan	1.27	1.23	1.18	1.13	1.07	1.00	0.93	0.85
	Insurance	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	Total Fixed Cost (Rs. in Lakh)	9.978	9.742	9.521	9.312	9.113	8.922	8.736	8.554
B	Sales Revenue (Rs. in Lakh)	0	66	78	90	108	120	120	120
C	Variable Cost (Rs. in Lakh)								
	peach (Av. Price @ Rs.50/Kg)	0.00	10.89	12.87	14.85	17.82	19.80	19.80	19.80

	Sugar @ 35 per kg	0.00	2.89	3.41	3.94	4.73	5.25	5.25	5.25
	Citric acid @ 80/- Kg	0.00	17.42	20.59	23.76	28.51	31.68	31.68	31.68
	Other ingredients	0.00	0.19	0.22	0.25	0.30	0.34	0.34	0.34
	Packaging materials	0.00	9.90	11.70	13.50	16.20	18.00	18.00	18.00
	Casual staff salaries	0.00	4.93	4.93	4.93	4.93	4.93	4.93	4.93
	Utilities (Electricity, Fuel)	0.00	1.66	1.96	2.26	2.71	3.01	3.01	3.01
	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	1.38	1.63	2.22	2.22	2.22	2.22	2.22
	Total Variable Cost (Rs. in Lakh)	0.50	51.95	60.11	68.61	80.32	88.13	88.13	88.13
D	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)	-	7.92	7.80	7.20	8.64	8.40	8.40	7.20

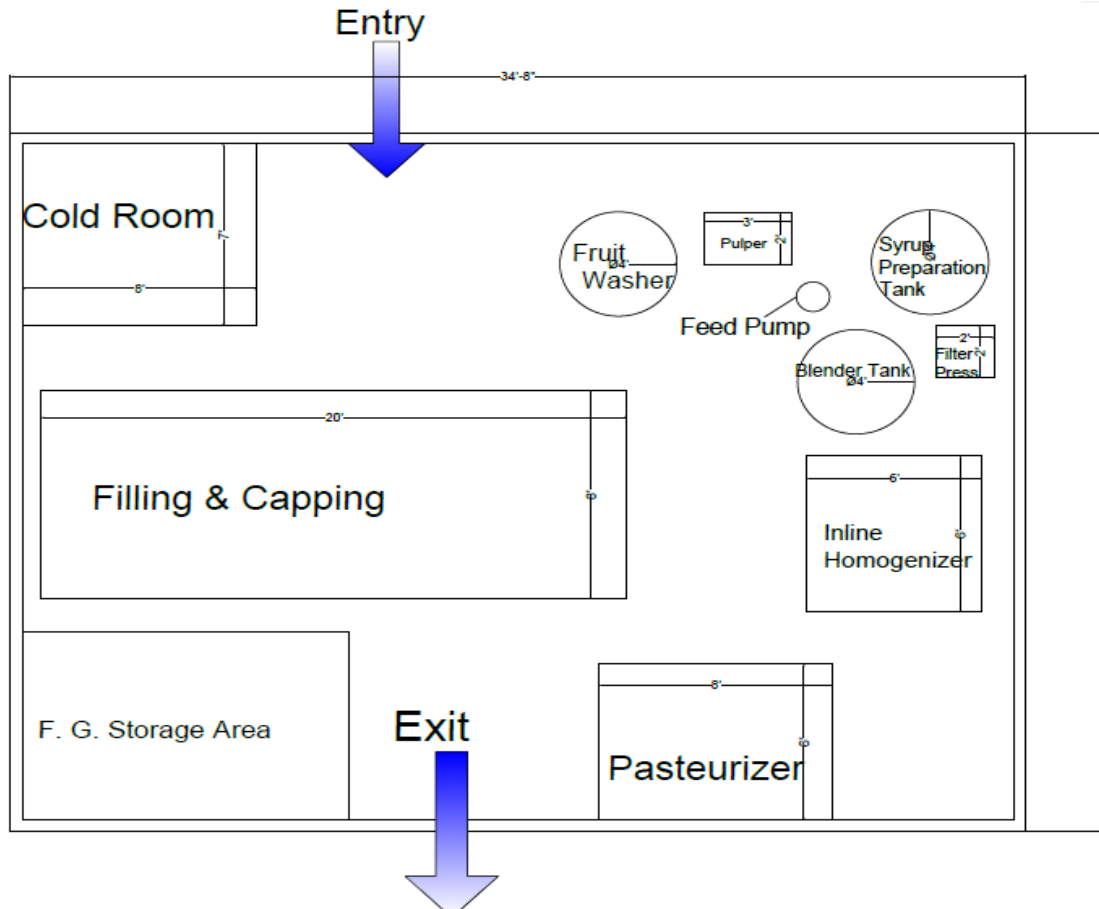
18. RAW MATERIAL REQUIREMENTS FOR THE UNIT

- 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 Peach juice manufacturing project, the unit requires 80 kg/day, 90 kg/day and 100 kg/day raw ripened fruit at 55, 65 and 75 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 fruit must be plucked from plant at mature stage; and then stored below 6°C temperature.

a. Pie chart for better understanding of expenses of each head.



19. TYPICAL PEACH JUICE MANUFACTURING UNIT LAYOUT



- The figures depicted here are in feet.

20.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

21.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.

22.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 costingbase/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.



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