



PM Formalisation of Micro Food Processing Enterprises Scheme

Processing of Litchi Beverages



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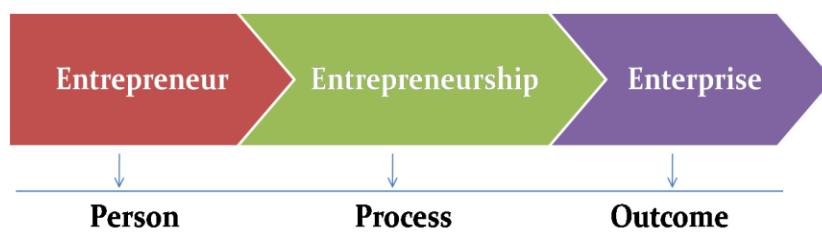
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Chapter-1

Entrepreneurship in litchi processing

An entrepreneur is a person who organizes a venture or enterprise to benefit from an opportunity, rather than working as an employee. Entrepreneurs commonly face many obstacles and challenges when building their ventures or companies. Therefore, it is important that entrepreneurs develop skills and learn the factors that may see him succeed or fail in his endeavour. Entrepreneurship development, therefore, refers to the process of improving the skill set and knowledge of entrepreneurs.

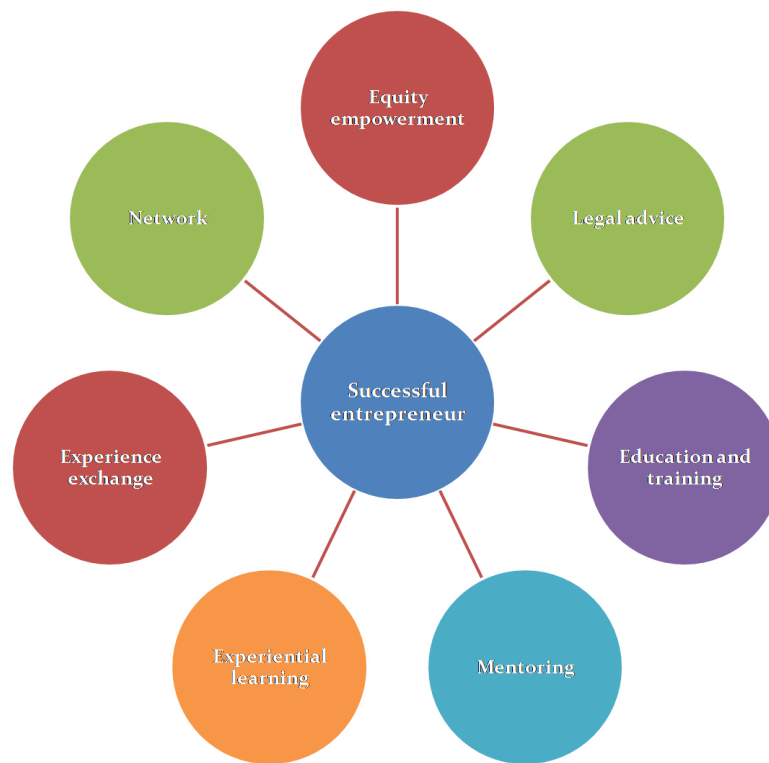
The basic requirement for any entrepreneur is the identification of an opportunity and the realisation that a business venture can be made possible through that opportunity. India is largely an agrarian economy and more than 50% of its population are still dependent on agriculture for livelihood and food security. Besides, the Indian population is set to overtake that of China to become the world's most populous country by the year 2022. Therefore, it is quite obvious that agri-based food sector offers tremendous opportunity for entrepreneurship.



Processing in litchi for entrepreneurship

Litchi is a fruit grown in several states of the country and is largely concentrated along the Indo-Gangetic plains. As per latest estimates (2018-19) litchi production has reached 700000 MT from an area of about 100000 ha in India. Large swathes of litchi orchards are found in Muzaffarpur and surrounding districts of Bihar. Assured availability of sufficient raw materials makes for optimistic assessment of entrepreneurship in litchi processing. Also, fresh handling of litchi is difficult due to highly perishable nature of the fruit. Huge losses occur in

the fresh handling of litchi. Processing and value addition is an important component of utilizing harvested produce without letting it get lost or wasted.



S.W.O.T. Analysis of entrepreneurship in litchi processing

Any new venture, no matter how promising, can fail because of the complex market factors that are in play. Before entering into any venture it is very important to carefully analyse and peruse the strength, weaknesses, opportunities and threats. A brief S.W.O.T. analysis on litchi processing as an area for entrepreneurship is given below:

Strengths:

- Shahi litchi of Muzaffarpur has obtained GI tag adding much value to its processing and marketing
- Litchi has very strong and pleasant flavour suitable for preparing beverages. Litchi beverages are quite popular and in demand
- Sufficient raw materials are available
- Processed products are shelf stable with longer shelf life and offers less risk in marketing (avoids glut and distress sale)

- Food processing sector has been tipped to grow, and there will always be demand for food and beverages

Weaknesses:

- Processing industry is capital intensive and requires considerably high investment
- Litchi harvesting season is short and period of availability is narrow.

Opportunities

- Business venture can be started from scratch on a home / domestic scale before growing big
- Very few brands of litchi beverages are available in Indian market
- Similar knowhow and practice can be followed to include other fruits in the processing unit once litchi season is over
- There exists huge potential for export

Threats

- Danger of spoilage and pathogenic micro-organisms that can contaminate raw materials and products
- Threat posed by food safety and public health concerns resulting from any step in food handling and processing

Chapter-2

Principles of Food Preservation

Preservation of food is as old as human civilization itself. Since time immemorial humans have devised ways and means to gather and store food in times of plenty to meet needs during days of scarcity. Food preservation can be defined as the science which deals with the methods of prevention of decay and spoilage of food, thus allowing it to be stored in a fit condition for future use. This chapter provides a brief insight, and introduces the reader, into general methods of preservation of food.

Reasons why food deteriorates or spoils

Food, including fruit beverages, can spoil because of one or a combination of the following reasons

- i. Fermentation by moulds, yeasts, bacteria
- ii. Enzymes present in the food
- iii. Chemicals present in pulp / juice may react with one another and spoil aroma / taste
- iv. Contact with air
- v. Traces of metal from equipment

Principles of food preservation

Any method of food preservation, aimed at preventing spoilage, is based on one or combination of the following three principles:

- i. Prevention or delay of microbial decomposition
- ii. Prevention or delay of self-decomposition
- iii. Prevention of damage by insects, animals, mechanical causes etc

Methods of food preservation

There are several methods of food preservation which can be used individually or in combination to preserve food. These methods are summarized in the following table.

Physical methods

1.	By removal of heat (preservation by cold)	Refrigeration Freezing Carbonation
2.	By application of heat (thermal processing)	Pasteurization Sterilization
3.	By removal of water (evaporation or	Sun drying Dehydration

	dehydration)	Freeze drying Concentration
4.	By irradiation	Treatment with UV or ionizing radiation
Chemical methods		
1.	By addition of acid	Pickled vegetables, fruits etc
2.	By addition of salt	Vegetable/fruit pickle, brine
3.	By addition of sugar	Fruit preserve, jams, jellies, marmalades, chutney etc
4.	By addition of chemical preservatives	Sulphur dioxide, benzoic acid, sorbic acid,
Fermentation		
1.	By fermentation	Alcoholic beverages, vinegar
Other Methods		Combination of one or more of above methods

Chapter-3

Methods of Fruit Quality Analysis

1. Estimation of Total Soluble Solids (TSS) in litchi juice

Total soluble solids (TSS) indicate the concentration of water soluble matter in the fruit juice. In general, TSS is an indicator of the degree of sweetness; more the value of TSS sweeter is the juice, and vice versa. TSS is expressed as degree Brix (°B).

The TSS of good quality litchi fruit ranges from 18-20 °B or even more at the time of harvest. ICAR-NRCL recommends litchi growers to wait until TSS has attained this level before deciding to harvest; this ensures good quality of fruit for both fresh fruit handling and for processing.

Equipment and Materials required:

- i. **Refractometer:** Refractometer is used to measure TSS in fruit juice. It can be either manual (Hand-held) or digital. As the names suggest hand-held refractometer, although usually cheaper, has to be handled and result inferred manually. Whereas, the digital refractometer provides result instantly in digital form. Both the types of refractometers are, otherwise, handy and portable (pocket-type).



Fig: Hand-held refractometer and digital refractometer

- ii. **Distilled water:** Distilled water does not contain any solids and its TSS is considered as 0°B. It is necessary for calibration of refractometer.

- iii. **Soft Tissue paper**
- iv. **Beaker**
- v. **Dropper**

Procedure:

- i. **Juice extraction:** Extract juice of litchi by squeezing a few litchi fruits into a beaker.
- ii. **Calibrating the refractometer:** Switch on the digital refractometer and add a few drops of distilled water into the sample slot. Gently wipe off the water with tissue paper. Again add few drops of distilled water into the sample slot and press the read sample. The digital reading will display Zero (0). Now press the 'Zero' button to calibrate the equipment, and gently wipe the water off with tissue paper.
- iii. **Sample reading:** Put a few drops of the fruit juice, collected in beaker, into the sample slot using a dropper, and press the 'Read' or 'Start' button. Note the TSS reading.

Precautions:

- 1. Practice due care to gently wipe the prism or sample slot carefully using soft tissue paper. This will prevent scratches on the glass or prism and prolong reliable usage of the refractometer.
- 2. Practice instant extraction and estimation as much as possible. Maintain minimum time lag between juice extraction and recording readings.

2. Estimation of titratable acidity of litchi juice

Organic acids play significant role in maintaining quality and nutritional value of foods. If present in very low quantity, they are occasionally added to foods, or beverages, to impart particular flavour or aroma. They also act as stabilizers or preservatives.

Materials, chemicals and glassware required:

- i. **NaOH :** Sodium hydroxide having strength of 0.1N is used during estimation of acidity. This can be prepared by adding 0.4 g of NaOH pellets into a volumetric flask and making up the volume to 100 ml with distilled water. Alternatively, ready-made NaOH (0.1N) solution is available in the market.
- ii. **Phenolphthalein indicator**
- iii. **Pipette (Glass pipette or micro-pipette)**
- iv. **Burette**
- v. **Conical flask**

- vi. Distilled water
- vii. Beaker
- viii. Volumetric flask

Procedure:

- i. Pour 0.1N NaOH solution into a burette and fasten it to a burette stand.
- ii. **Juice extraction:** Extract juice of litchi by squeezing a few litchi fruits, through a clean muslin cloth, into a beaker.
- iii. Pipette 2 ml of juice into a conical flask
- iv. Add 2-3 drops of phenolphthalein indicator
- v. Add some distilled water into the conical flask and mix the contents well.
- vi. Note the burette reading and titrate by adding NaOH solution into the conical flask.
- vii. Stop titration when the content in conical flask turns light pink. Note the final burette reading and calculate the quantity of NaOH solution used (Titre value)

$$\text{Acidity (\%)} = \frac{\text{Titre value} \times 0.1 \times 0.067}{\text{Volume of sample taken (2 ml)}} \times 100$$

Chapter-4

FSSAI Standards for Beverages

1. FSSAI standards

As per guidelines mandated by the FSSAI, the standards for different fruit beverages are tabulated below:

Beverage	Pulp/Juice (%) Minimum	TSS (%) Minimum	Acidity (%)	Preservative (ppm SO ₂) Max. limit
Ready-to-serve (RTS)	10	10	0.3	70
Cordial	25	30	3.5	350
Squash	25	40	3.5	350
Fruit Crush	25	55	3.5	350
Pulp	100	Natural sugar	-	1500

2. Packaging

Packaging is the enclosure of products, items or packages in a wrapped pouch, bag, box, cup, tray, bottle, or other container. Packaging performs one or more of the functions of Containment, Protection, Convenience and Communication. Every food item is packaged to preserve its quality and freshness, add appeal to consumers and to facilitate storage and distribution. Packaging serves as a symbol of value-addition and assurance of quality.

FSSAI mandates that beverages such as juices, squashes, crush, cordials etc shall be packed in clean bottles securely sealed.

The following packaging materials are commonly used for packaging litchi beverages:

- a. Glass bottles: Glass bottles are chemically inert and do not affect quality, odour, and taste of the content. They are also rigid and recyclable.
- b. PET : Food grade PET (Polyethylene terephthalate) bottles are cheap, easily available, sturdy and recyclable
- c. Cartons: Cartons protect freshness, flavour, and nutritional content of the beverages. They also allow for storage at both ambient and refrigerated conditions.

3. Labelling

Labelling performs the communication function of packaging.

The label must carry the following information:

- Name of the food
- List of ingredients in descending order
- Nutritional information
- Name and complete address of manufacturer
- Net content by weight or volume
- Lot/Batch identification No
- Date of manufacturing / packing
- Best before
- Veg / Non-veg logo
- Country of origin
- FSSAI Registration /Licence number
- Maximum retail price

Chapter-5

Protocol for Extraction and Preservation of litchi pulp

Fruit juice is the unfermented but fermentable liquid obtained from the edible part of sound, appropriately mature, and fresh fruit. Litchi pulp / juice is the primary product obtained by squeezing, crushing, pressing the aril (edible portion) of litchi. Litchi pulp can be preserved and stored in containers of convenient size. Preserved pulp can be marketed as a product in the form of business to business dealings or can be used as ingredient for further processing into different litchi beverages.



Equipments, chemicals and materials required

- i. Litchi grading machine
- ii. Litchi peeling machine
- iii. Fruit pulper

- iv. Plastic crates
- v. Potassium metabisulfite (KMS)
- vi. Citric acid
- vii. Muslin / filter cloth
- viii. Food grade containers (plastic barrels, SS vessels, etc)
- ix. Weighing balance / machine
- x. Clean potable water
- xi. Homogenizer

Process for extraction and preservation of litchi pulp

The following sequential process, including adoption of good harvest and postharvest practices, may be followed for extraction and preservation of litchi pulp.

1. **Harvesting at correct fruit maturity:** Litchi is a non-climacteric fruit and does not ripen after harvest. This means that if the fruit is harvested immature, its quality will not improve during postharvest handling and storage. Immature fruits are acidic, low in sugars and do not possess the typical rosy flavour, traits that are indispensable for successful litchi processing. ICAR-NRCL recommends that litchi should be harvested when the TSS of fruit attains 18-20°B, acidity less than 0.5 %, TSS:acid ratio > 40. Processors should ensure that fruits they harvest or procure for processing have been harvested at the correct harvest maturity.
2. **Sorting and grading:** Litchi fruit lot must be sorted to remove diseased or decayed fruits, debris including leaves and twigs, and all extraneous materials. Sorted fruits can be graded using a litchi grading machine that grades litchi into different lots on the basis of size. Graded fruits increase the efficiency and peeling percentage of peeling machine. Alternatively, sorting and grading can be done manually.
3. **Washing:** Thoroughly wash the fruits with clean potable water.
4. **Peeling:** Peel litchi fruits using the peeling machine. Alternatively, fruit can be peeled manually.
5. **Pulping:** Put the peeled litchi fruits into the fruit pulper to extract pulp/juice. Alternatively, screw-type juice extractor can also be used, while for home/domestic scale processing mixer-grinder will serve the purpose.

6. **Filter:** Filter and strain the extracted juice through a fine mesh cloth or muslin cloth, so that solid residue (pomace) is removed and only juice of even consistency is obtained.
7. Pour into clean and sterile food grade containers
8. Measure the TSS and acidity of the pulp/ juice.
9. As per market demand or buyer's specifications, maintain acidity level of pulp by adding required amount of citric acid and mix it thoroughly throughout the pulp.
10. Add potassium metabisulfite (KMS) @ 1500 ppm (SO₂) to the pulp; mix it thoroughly in the pulp.
11. Seal the container properly
12. **Storage:** Litchi pulp undergo discolouration if kept under ambient (normal) conditions. Cold storage can maintain colour and quality of litchi pulp.

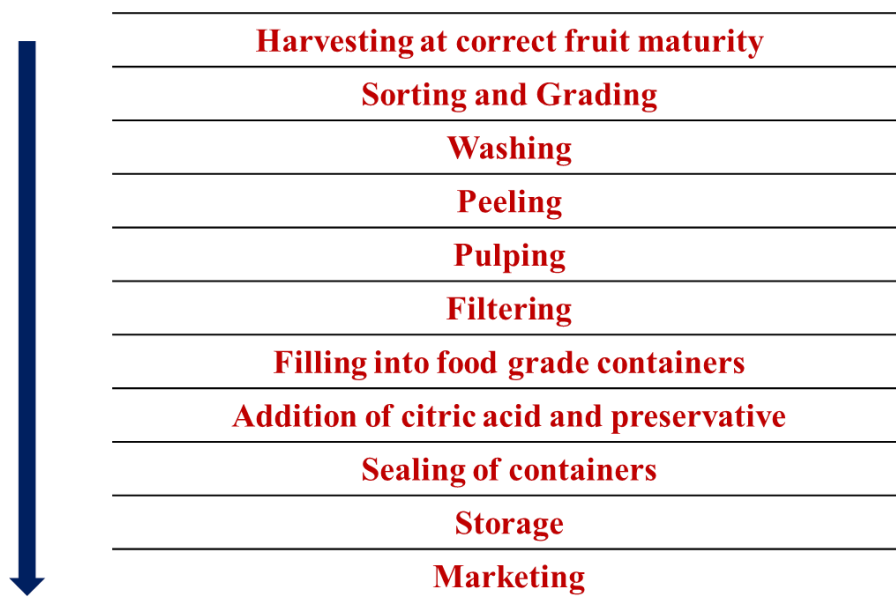


Figure: Flowchart for pulp extraction and preservation of litchi

Precautions: Dos and Don'ts

- i. **Use of plastic crates:** Handling of harvested litchi is best done in plastic crates. While initially expensive, plastic crates are durable, washable, reusable, and easily stackable.
- ii. **Choosing the best raw material:** It is a quite obvious practice that the best quality litchi is marketed as fresh fruit, the lower

quality fruit are used for processing. Small size fruits with very low edible matter result in very low pulp recovery. This adds to the cost of processing because of the time and labour used to sort, grade, and peel a large proportion of fruit that result in very less recovery. Diseased and decayed fruits when used in pulp extraction add to the microbial inoculum and aggravate pulp spoilage and fermentation. Therefore, processors must ensure that only good quality fruits are used for extraction of juice. This will ensure high pulp recovery, good quality pulp, and reduce cost of processing.

- iii. **What should be the ideal size of container:** Deciding the size of container primarily depends on the purpose of pulping. If the pulp is to be marketed directly, processors should use food grade plastic barrels (usually HDPE) or metallic drums. If the extracted pulp is meant for further storage to be used as raw material for micro scale processing, it is advisable to make use of smaller size food grade plastic containers. This ensures that the container is opened for single time for further processing, which otherwise would not be possible if a large barrel is used. Use of small containers also helps in damage limitation, in the event of pulp spoilage or fermentation.
- iv. Use preservative within permitted limit.

Chapter-6

Protocol for Preparation of Litchi Squash

Fruit squash is an unfermented beverage (non-alcoholic) containing moderate quantities of fruit pulp and sugar. Squash is diluted before consumption. By virtue of possessing distinct and unmatched flavour, litchi is popular as sherbets and drinks. As per regulation, any fruit squash must contain atleast 25% fruit pulp, 40°B TSS and not more than 3.5% acidity.



ICAR-NRCL has developed protocol for preparation of litchi squash. Technical specifications of the squash include:

- Litchi pulp : 25%
- TSS (sugar) : 40%
- Acidity : 1.2%
- Preservative (SO₂) : 350 ppm

Materials and equipment required:

- i. Litchi pulp
- ii. Sugar

- iii. Citric acid
- iv. Permitted preservative (KMS)
 - v. Muslin cloth
- vi. PET bottles (food grade)
- vii. Stainless steel vessel
- viii. Refractometer
- ix. Clean drinking water

Procedure for preparation of squash (small scale)

- i. Heat water in a stainless steel vessel or jacketed kettle of appropriate size and bring it to a boil or slightly below it.
- ii. Add required amount of sugar and prepare syrup by dissolving the sugar completely
- iii. Add required amount of citric acid and mix thoroughly
- iv. Pour the required amount of litchi pulp and mix properly by stirring the mixture
- v. Filter or strain the squash through a clean muslin cloth into another stainless steel vessel.
- vi. Add required amount of preservative and mix well into the whole product
- vii. Immediately fill the squash into clean glass or PET bottles and seal the bottle.
- viii. Apply label and store

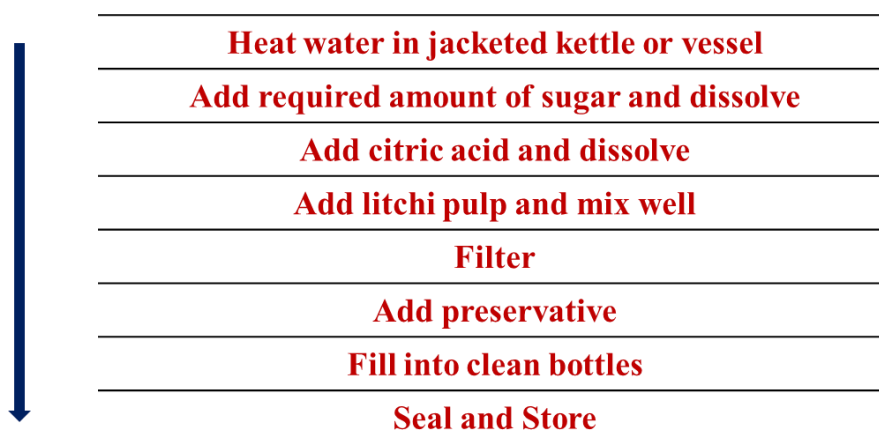


Figure: Flowchart for preparation of litchi squash and RTS

Chapter-7

Protocol for Preparation of Litchi Ready-To-Serve (RTS)

Ready-to-serve beverage, as the name suggest, is a beverage that is consumer-ready and is does not require further dilution before consumption. As per regulation any RTS beverage should contain atleast 10% of fruit pulp and 10°B TSS. RTS is usually preserved by pasteurization and is best served chilled.



ICAR-NRCL has developed protocol for preparation of litchi RTS. Technical specifications of the RTS include:

- Litchi pulp : 10-15%
- TSS (sugar) : 10-15%
- Acidity : 0.2-0.3%
- Preservative (SO₂) : 70 ppm

Materials and equipment required:

- i. Litchi pulp
- ii. Sugar
- iii. Citric acid
- iv. Permitted preservative (KMS)
- v. Muslin cloth

- vi. PET bottles (food grade)
- vii. Stainless steel vessel
- viii. Refractometer
- ix. Clean drinking water

Procedure for preparation of RTS (small scale)

- i. Heat water in a stainless steel vessel of appropriate size and bring it to a boil or slightly below it.
- ii. Add required amount of sugar and prepare syrup by dissolving the sugar completely
- iii. Add required amount of citric acid and mix thoroughly
- iv. Pour the required amount of litchi pulp and mix properly by stirring the mixture
- v. Filter or strain the squash through a clean muslin cloth into another stainless steel vessel.
- vi. Add required amount of preservative and mix well into the whole product
- vii. Immediately fill the squash into clean PET bottles and seal the bottle.
- viii. Apply label and store

Precautions for both Squash and RTS preparation:

- i. Do not overheat the sugar syrup to avoid browning of syrup due to caramelization of sugar
- ii. Ensure that sugar used in litchi squash preparation is of good quality (crystalline white)
- iii. Use preservative within permitted limit
- iv. Maintain food safety and hygiene practices at all times

Chapter-8

Setting up a small scale fruit beverage unit

Economic opportunities abound for enterprising small agri-business people worldwide. Processing produce to a preserved state adds value to produce that commonly sells for low price in its fresh state. Entrepreneurship in small scale fruit processing can provide new jobs for the community, requires only a small capital investment in equipment and supplies and can result in a fast return on investment.

Considerations before setting up the processing unit

1. Processing unit should be near or within the vicinity of production area
2. Ensure that there is sufficient raw material available for running your processing unit to full capacity round the year.
3. Strengthen backward and forward linkage (Whom to buy raw materials and ingredients from, and whom to sell processed product to)
4. Processing unit should be well connected by roads, preferably near to highways, railways station, or airport.
5. Availability of sufficient clean potable water. It will be advisable to avoid polluted places where drainage, sewerage and air quality issues exist.
6. Availability of electricity
7. Availability of personnel, seasonal as well as permanent (employees/labour)
8. Ensure sufficient space is available for future expansion of processing unit

FSSAI licencing

Any Food Business Operator involved in manufacture, repacking, reselling, marketing or any other activity related to food meant for human consumption in India requires to be regulated by the guidelines of the Food Safety and Standards Authority of India (FSSAI), under the Ministry of Health and Family Welfare, Government of India. The

FSSAI registration and licensing procedure is given at <https://foodlicensing.fssai.gov.in/index.aspx>

Government approvals or clearances required

Setting up a fruit processing unit, including obtaining licence from the FSSAI, may require some or all of following government approvals or clearances:

1. Registration with Registrar of companies if under private / self-entrepreneurship
2. No objection Certificate (NOC) from local bodies/panchayat etc
3. Consent from State Pollution Control Board
4. Approval of blueprint/ layout plan for construction if any
5. Registration with District Industry Centre (DIC) for Small and Medium enterprise
6. Licence from FSSAI for large scale marketing
7. Proof of possession of premises
8. Analysis report of water (chemical and bacteriological)

Typical quality problems and sources of losses

1. Harvesting at improper maturity
2. Inadequate sorting to remove diseased and contaminated produce
3. Inadequate washing and cleaning of produce before processing
4. Improper trimming (removing too much or too little of the inedible portions)
5. Following improper processing methods
6. Misuse of processing methods
7. Inadequate or inappropriate packaging materials

Food safety during processing

Consumers expect that food processors will manufacture wholesome and nutritious foods. Food business operators (FBO) must have systems in place to assure that products which are being manufactured do not have physical, chemical or microbial contaminants introduced during processing and packaging. Common sources of potential contamination include animal waste, fertilizers, contaminated irrigation water, human handling practices, contaminated containers and food preparation area.

If food safety systems are not in place during processing, consumers are put at risk. A single incident of personal injury traced to a specific food processor may put that enterprise/company out of business and result in criminal prosecution of the owners and management. Therefore, your long term success as a food processor depends on your ability to consistently produce safe products.

Generals Do's and Don'ts to assure food safety during processing

1. Follow FSSAI regulations regarding type of licenced facility
2. Educate and train employees in proper food handling practices and personal hygiene
3. Strictly adhere to Good Manufacturing Practices (GMP)
4. Design food processing and storage area to allow for easy cleaning and sanitation
5. Monitor raw material suppliers for adherence to Good Agricultural Practices (GAP)
6. Keep processing facility clean and hygienic
7. Only use potable (safe to drink) water and monitor water quality regularly
8. Provide adequate numbers of toilets and hand-wash stations for employees; toilets should be segregated from processing area
9. Cleaning and toxic chemicals should be stored in secured locked area
10. Effective rodent and insect control schedule should be in place and monitored.

Good Manufacturing Practices

GMP's are guidelines to assure that food for human consumption is safe and has been prepared, packed and held under sanitary conditions. GMPs involve personnel, physical plant, construction and design guidelines.

Personnel GMP's:

- Educate and train all food handlers about sanitary handling of food
- Sick and unwell employees, or those with open wounds, skin sores etc must report to supervisors and not be allowed to work with edible food products

- All food handlers must wear apron or outer garments (gloves, hair restraint, masks etc)

Physical plant and grounds:

- Processing unit should be segregated from outside environment
- Should have no gaps that allow rodents, insects, birds etc
- Sanitation and hygienic surroundings
- Prevent unpaved or dusty road leading o the processing unit
- Ensure proper drainage and ensure there is no standing or pooled water

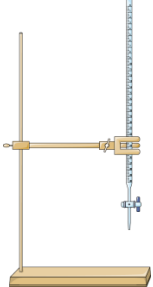
Construction and design:

- Ensure sufficient space for sanitary operation
- Design processing area for easy cleaning and sanitation
- Floors, walls and ceilings should be cleanable
- Use tiled floors to withstand physical and chemical wear and tear
- Use food grade stainless steel equipment
- Ensure adequate lighting
- Food processing areas are usually wet; therefore, sloping floors with drains should be present
- Hot running potable water, soap and hand towels should be available at all times
- Place signs and posters to instruct employees about sanitary practices

List and gallery of equipment, tools and materials required for small scale fruit beverage unit

Equipment/Tool/Material	Picture *
Steam Jacketed Kettle (Stainless steel grade SS 304 or SS 316)	

Solar water heater	
Refrigerator	
RO + UV/UF water purification system with TDS controller	
Fruit and vegetable washing machine	
Twin fruit pulper	
Food preparation table	

Hand held refractometer	
Digital refractometer	
Crown corking machine	
Weighing scale (2 Nos)	
Beakers	
Burette	

Conical flask	
Dropper	
Pipette	
Micro-pipette	
Volumetric flask	
Barrels or containers	



***Disclaimer:** The pictures provided here are meant to serve for illustration purpose only, and does not mean endorsement or recommendation of IIFPT.

Chapter-9

Epilogue

Litchi is a highly perishable fruit. Fresh handling and marketing is difficult without cool chain logistics, with huge losses being incurred in the postharvest supply chain. Value-addition through processing offers tremendous potential for reducing these losses and proper utilization of harvested produce. More importantly, litchi processing promises development of enterprises as successful business models.

While the level of processing of horticultural crops is less in India, litchi processing is about 10% meaning that the fruit has a proven sector for businesses to succeed. Beverages based on litchi are refreshing and flavourful, much preferred among consumers. Unlike other industrial sectors where huge capital investment is required, fruit processing can be successfully done even on home or domestic scale that requires very less investment.

Litchi processing is an area where growers can realise higher farm incomes. During harvest time in litchi orchards, fruits are sorted manually and after class-I fruits are packed for the fresh market, there is generation of considerable unmarketable surplus. These either become waste or are sold at throw-away prices. Small enterprises can successfully thrive within large pockets of litchi plantations feeding off this generated yet unmarketable surplus; thereby increasing farm incomes. Another positive of this is the development of related sectors associated with processing – processing equipment and tools, packaging, cold stores, logistics and transportation, and the employment that they bring.

As done in litchi, other fruits can also be processed in similar manner and process. Entrepreneurs in fruit processing can ensure round the year processing by including different fruits as per the seasonal availability. This will ensure that business does not remain one of a seasonal nature and equipment are run continuously for longer periods. Ultimately, this will result on a quicker return on initial investment. Temperature management is paramount in handling and storage of both fresh fruits and processed products. Nowadays, solar-

powered cold rooms are available in the market, which can prove very useful in areas where power outages are long and frequent. Although initially more expensive than conventional cold rooms, users can save on electricity expenses. Various state governments also provide subsidies on solar cold rooms which can be availed.

Entrepreneurship in litchi beverages is a bigger picture than simply learning the knowhow and developing the skills to produce the finished product. There is a host of factors that any entrepreneur needs to learn and control to make any enterprise or business successful – financing, loans, unit development and design, licences and clearances, labour management, raw material procurement, marketing, legal aspects, Good Manufacturing Practices (GMP), food safety, and many more.



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