



# PM Formalisation of Micro Food Processing Enterprises Scheme

## Processing of Jardalu Mango Leather



**AATMANIRBHAR BHARAT**

**National Institute of Food Technology, Entrepreneurship and  
Management (NIFTEM) - Thanjavur**

(an Institute of National Importance under Ministry of Food Processing Industries, Government of India)

Pudukkottai Road, Thanajvur – 613005

<https://niftem-t.ac.in/>

Ph : 04362-228155, Fax:04632-227971

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## **CHAPTER 1**

### **INTRODUCTION**

#### **1.1 INTRODUCTION**

The Jardalu variety of mango of Bhagalpur is the second most globally famous thing of Bihar after the "tussar silk". A piece of Jardalu mango generally weighs between 220 gm-250 gm and has a special aroma with brilliant yellow colour. Jardalu mango famous for its exclusive aroma, sweetness and other nutritional properties, the Jardalu mango is considered as a safe fruit for even those who have been diagnosed with diabetes or have a poor digestive system. It is rich with fibre and enzymes that are highly beneficial to the abdominal muscles and digestive system. Jardalu is a very short time variety of mangoes and sensitive to deterioration and even when stored under refrigerated conditions; therefore, need to get processed during glut period.

Jardalu mangoes fetched to Geographical Identification (GI) tag in 2018 due to its exclusive aroma with brilliant yellow colour, sweetness and other nutritional properties. They are also sent as gift to dignitaries, including the Prime Minister, President, Vice President Lok Sabha Speakers, and chief ministers by the Bihar Government every year. The Jardalu mangoes are procured directly from the mango orchards and put inside the safe gift packets every year, since 2007.

#### **GEOGRAPHICAL IDENTIFICATION (GI) TAG**

Jardalu mango has been described as a unique product from Bhagalpur in the Geographical Indications Journal's issue dated November 28, 2017. The journal is now available in the public domain, as per rule 41(1) of Geographical Indications of Goods (Registration and Protection) Rules, 2002. This mango variety is known for its light yellow skin and special aroma. It has been mentioned in the journal that the Jardalu mango was first planted in Bhagalpur region by Maharaja Rahmat Ali Khan Bahadur of Kharagpur. The journal has quoted growers association as saying that a more than 200-year-old Jardalu tree in Tagepur village under Jagdishpur block of the district acted as mother plant.

The application for GI tag was moved by Jardalu Aam Utpadak Sangh (Jardalu mango producers' union), Madhuban, Maheshi village under Sultanganj block of Bhagalpur district.



## 1.2 AREA AND PRODUCTION

- Bihar ranks third in mango cultivation and covers and covers about 50% of the total fruit area in the state.
- Jardalu variety of mango, which is successfully grown in Bhagalpur district of Bihar with an area of 1600 ha. and production of 7500 tonnes. **Source: National horticulture mission**

## 1.3 STRUCTURE OF MANGO PLANT

Mango belongs to family Anacardiaceae. Seedling trees are big in size and can grow over 20-metre-high with a same spread. Grafted trees can attain a height of 8-10 meters with a dome shaped top. Mango is evergreen with spreading branches.

The leaves are alternate, leathery and lanceolate in shape, with short petiole. Inflorescences in mango appear mostly terminally and rarely axillary. Flowers are small both male and hermaphrodite flowers are borne on the same inflorescence, which may be of 10-40 cm long. The stamens (4-5) of different lengths are present in a flower only one or two are fertile and rest are reduced to staminodes. Ovary is one celled, oblique and compressed. The fruit is a drupe with leathery epicarp, fleshy mesocarp (edible) and a seed with hard covering (stone) endocarp.

### 1.3.1 SPECIFICATIONS OF JARDALU MANGO

| Sl.No | Parameter           | Quantity     |
|-------|---------------------|--------------|
| 1     | Weight              | 200-210 g    |
| 2     | Total soluble sugar | 22-23%       |
| 3     | Ripening time       | 104-106 days |
| 4     | Production/tree     | 77-315 kg    |
| 5     | Edible portion      | 68%          |

## CHAPTER 2

### PROCESSING OF JARDALU MANGO

#### 2.1 JARDALU MANGO PROCESSING

Mangoes are processed at two stages of maturity. Green fruit is used to make chutney, pickles, curries and dehydrated products. The green fruit should be freshly picked from the tree. Fruit that is bruised, damaged, or that has prematurely fallen to the ground should not be used. Ripe mangoes are processed as canned and frozen slices, purée, juices, nectar and various dried products. Mangoes are processed into many other products for home use and by cottage industry.

Processing mango provides an economical way to store and transport mango from regions of production to distant markets. Processing allows small and medium sized businesses to create jobs in growing, processing, marketing and to contribute to the economic growth of a region.

**Several options have become available for large scale processing of mango products.**

1. Mango pulp
2. Juice
3. Nectar
4. Fruit sauces
5. Fruit cocktails
6. Dried mango slices
7. Mango wine
8. Glazings
9. Flavoured yoghurt
10. Ice cream

##### 2.1.1 HARVESTING OF JARDALU MANGO

Harvesting is the process of collecting fruits that are matured from the fields. Harvesting at the wrong time will lead to undesirable consequence such as fruit rot and post-harvest losses.

**MATURITY INDICES:** Mango fruits harvested at the correct stage of maturity develop good peel and pulp color and have full flavor and aroma at the ripe stage. Mangoes harvested at an immature stage of development can be induced to ripen but the quality of the ripe fruit and

particularly the flavor, is inferior. Maturity indices are an indication of the readiness of the fruit for harvest.

There are several methods of assessing the maturity of mangoes. These include:

- ◆ Shape – flat shoulder at stem end; fullness of cheeks.
- ◆ Peel appearance – presence of bloom (white powdery substance on the peel, change in peel color from dark to light green (for some varieties).
- ◆ Pulp color – light creamy yellow pulp.

**GRADING AND PACKAGING:** After harvest fruits are placed in shade under a varandah/ store. The grading is done before packing in boxes or baskets. Fruits are graded as per weight grade A-100 to 200 gm., B 201- 350 gm, C 351-550 and D-551-800 gm. The different grades are packed in wooden boxes or baskets.

A basket may contain 50-100 fruits. Straw is used for packing. Wooden boxes are used for distant marketing. A box may contain 10 kg of fruit. Trash and paper is used to protect the layer of fruits from the second layer. Perforated card board is also being used. The fruits are individually packed/wrapped with tissue paper or paper shavings are used for cushioning.

## **NEED OF PROCESSING**

Amongst the various fruits particularly grown in the tropical and subtropical regions, mango is one of the important commercial fruit crop which having the excellent processing qualities. Being non climacteric fruits, mango cannot be stored for a long period. Mango can be kept out at room temperature where they will stay fresh for up to one week. Therefore, the development of appropriate processing technology and product standardization will definitely help in better utilization of mango fruits particularly during the seasonal glut. The processed products prepared from well matured mango fruits are pleasant, best flavored, good storable and eventually represents better value added form that aids to conserve the excess fruit production and fast perishability.

## **2.2 PREPARATION OF JARDALU MANGO LEATHER**

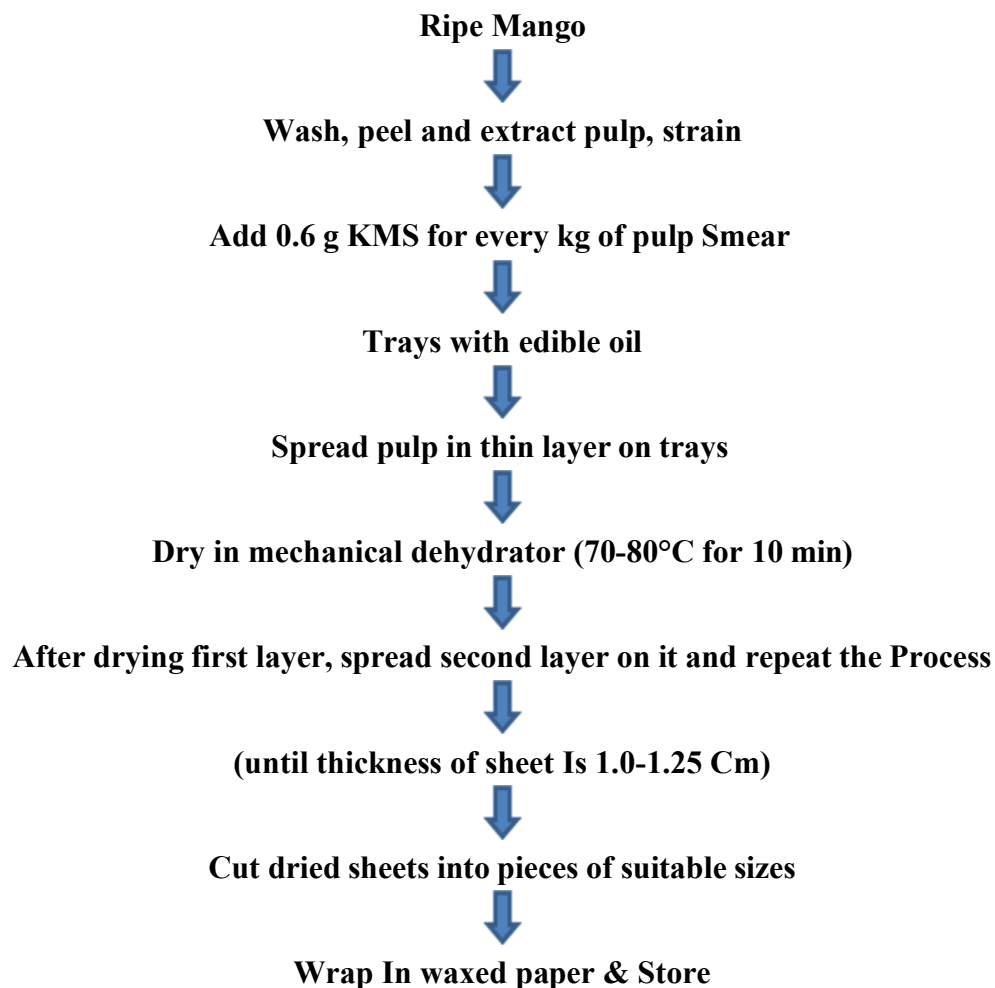
Mango leather and mango bar are delicious and nutritious products. The manufacturing process is simple. And the commercial manufacturing is a highly profitable business. Fruits are highly perishable items. Additionally, fruits are only available on the seasonal basis. Therefore, different types of value-added processed fruit products are commercially very successful. It can be predicted that few entrepreneurs may enter in this

venture along with other mango base product. Mango leather is a traditional item. However, commercially produced mango leathers are better in terms of color, taste, and quality. Furthermore, fruit toffee is a highly nutritious food compared to other toffee and chocolates. Pulp fruits like banana, mango, guava, apple, pineapple etc. are the best fruits for making mango leathers.

### **2.2.1 REQUIREMENT:**

Raw materials are like fruit pulps and juices, starch, sugar, color, preservatives, skimmed milk powder, hydrogenated fat, flavor, glucose etc.

### **2.2.2 FLOWCHART OF MANGO LEATHER PREPRATION**



1. **Preliminary Washing:** Washing water can be chlorinated by adding 1teaspoon of chlorine to 4.5 litres of water in order to reduce microbial load and impurities from the fruit. A second washing with clean water is made to eliminate residual chlorine.
2. **Sorting and grading:** After removing A grade mango (As Jardalu had good market value), B and C grade fruits can be taken for processing. All fruit should be ripe and free from bruising. Any rotten or bruised fruit should be thrown away as this will spoil the colour and flavour of the leather.
3. **Peeling:** After washing drain the water from mango surface. Peeling can be done by two ways: manually and by machines. Manual peeling can cause a reduction of up to 5.6% in the recovery of slices compared with machine peeling.
4. **Cutting: Preparation of the mango:** Pulp is separated from the seed manually or by using a food mill. If electricity is available, a liquidizer or blender can be used to increase the production output. The liquidized mangoes are strained or sieved to remove fibers, seeds and other unwanted materials and make a smooth puree.
5. **For further processing:** Puree can be semi-processed and stored in sealed drums for further processing later in the season. Sulphur dioxide (SO<sub>2</sub>) (600ppm) is added to the drums to prevent the growth of microorganisms. The semi-processed mango pulp can be stored for several months.
6. **Weighing and Mixing:** Weigh the pulp and mix with the sugar, lemon juice and Sodium of potassium metabisulphite in the ratios of Sugar - 10-15% of the pulp weight according to the consumer taste, Lemon juice or citric acid - 2 spoons per kg pulp, Sodium of potassium metabisulphite - 2g per kg pulp Other ingredients could be added as per the demand of the market as skim milk powder, corn flour, roasted defatted soy flour. Chopped nuts, coconut or spices to vary the taste and flavour. Chemical preservatives may be added to the mango puree to maintain a bright colour in the leather.
7. **Thermal treatment:** A heat treatment is applied to the pulp to prevent chemical and microbial spoilage. In this treatment the pulp reaches 70-80°C and is held for 10 min. with continuous stirring to inactivate the enzymes and reduce the level of microbiological contamination.
8. **Drying:** The leathers should not be dried in direct sunlight as this will cause the colour to fade and reduce the levels of vitamins A and C. Indirect solar dryers or mechanical dryers should be used. Remove the foam from the top of the mixture. Grease the surface of trays

with glycerine to prevent the leather from sticking. Pour the fruit puree mix in a thin layer (3-6mm thick) on plastic trays or wooden.

The leather is dried until it has a final moisture content of 15-25%. After drying, the leather pieces should be dusted lightly with starch to prevent them sticking together. The product will have a soft, leather-like consistency. Place three sheets of leather on top of each other and cut into small 4x4cm squares.

- 9. Packaging and Storage:** In the current growing market of fruit leathers, commercial packaging is necessary. Packaging materials for fruit leather are required to prolong the shelf-life of the product and, normally, relate to the stability of water activity, microbiological stability, sensory properties, and physicochemical characteristics. Wrap each square in cellophane. It may be necessary to dust the squares with corn flour to prevent excess stickiness. Pack in plastic bags, label and store in a cool dry place.

### 2.2.3 MACHINERY USED FOR LEATHER PROCESSING

In mango leather plant following are the steps that are performed and machineries are provided for the respective process.

- Washing - With Mango washer



- Sorting - With multi stage Inspection conveyor



- Destoning - With Destoner



- Pulping - With Coarse Pulper and Fine Pulper



- Pasteurization - With Multi Tube Pasteurizer and Retort



- Drying- With mechanical dryer



## 2.2.4 PRECAUTION:

All equipment must be thoroughly cleaned each day to prevent contamination by insects and micro-organisms

## **CHAPTER 3**

### **PACKAGING OF JARDALU MANGO LEATHER**

Food packaging is the enclosing of food for the purpose of protection and preservation. Leather is an extremely consumer-driven product. Packaging is one of the most important factors driving sales, food identity and brand construction. Package role is to preserve the freshness of mango leather and attractive design for marketing and branding.

Proper packaging is essential in maintaining produce quality during transport and subsequent handling. Packaging materials should provide adequate protection to its contents, should facilitate convenience in handling the produce, attract consumers and sell the contents, and inform the consumers about the produce inside the pack. In today's competitive world, packaging plays a crucial role in creating value added consumer friendly, self-selling packs. There are several types of packaging machines available such as sealing machines, filling machines, strapping machines, wrapping machines, coding machines, labeling machines.

#### **Functions of packaging**

- ☐ Ability to protect the content from spoilage and spillage
- ☐ Offer protection against environmental conditions- moisture barrier
- ☐ Prevent insect infestation and insect damage
- ☐ Offer protection against microorganisms – oxygen barrier
- ☐ Economical, easily available and easy disposal
- ☐ Strength properties to withstand mechanical hazard during transportation and storage

#### **The packaging requirements for all types of leathers are:**

- ☐ Absolutely leak-proof and prevent contamination
- ☐ Protect the contents against chemical deterioration
- ☐ No pick up of external flavors
- ☐ Be hygienic and safe
- ☐ Retain carbonation in the case of carbonated beverages
- ☐ Economical, easy to use and dispose
- ☐ Good aesthetic appearance

### 3.1 NEED OF MANGO LEATHER PACKAGING

Different horticultural products need different types of packages depending on their physical, anatomical and physiology (mainly transpiration, respiration and ethylene production rate) nature and susceptibility to microbial decay. Temperature, relative humidity and ventilation also plays a very important role in determining the post-harvest life of the mango.

**In addition to protection and preservation –**

- ☐ Maintenance of the food's shelf life
- ☐ Containing the foods
- ☐ Providing information about the ingredients and
- ☐ Nutritional aspects of its contents
- ☐ Providing convenience for customers during usage and consumption
- ☐ Prevention from environmental damages.

#### 3.1.1 TYPES OF PACKAGING

- 1) **Conventional packaging** is comprising of wooden boxes, bamboo boxes and jute gunny bags, and baskets made of woven strips of leaves.
- 2) **Modern packaging** includes card board, plastic crates, poly bags, flexible sacks made of plastic jute such as bags (small sacks) and nets (made of open mesh), Plastic crates Pallet boxes and shipping containers, wire bags, are generally used.
- 3) **C.A.P. (Controlled Atmospheric Packaging)** is the best modern packaging method for packaging of fruits. It allows certain gaseous component from atmosphere to replace, released by the fruits or check the gaseous exchange around fruit pack and thus enhance shelf life of fruits.

#### 3.1.2 PROCESS OF PACKAGING

The pouches are dropped into a larger machine that automatically groups and packages the product. This machine is programmed to fill cardboard packages by weight. The cardboard packaging is generally made out-of-house, and includes all important information such as nutritional information. Packaging is often very brightly colored and full of images of popular cartoon characters and is an essential part of product marketing.

Many packaging materials such as **polyethylene**, **polypropylene**, **polyester**, and **foil** are used for packaging. These materials have varying degrees of strength, barrier, and stretch properties, which enhance their use for packaging food products. However, polyethylene is the most used polymer. It has the simplest chemical composition of all polymers, that is, a straight chain hydrocarbon which is produced by addition polymerization of ethylene. It is widely used in films, blow-molded items, and laminations



### 3.1.3 MACHINES OF PACKAGING

#### Filling Section and Equipment's

Filling machines used to fill pouch and packets of dehydrated leaves.

General types of filling machines: –

- ☐ Agitator Filling Machines
- ☐ Flow filling machines
- ☐ Tablet fillers

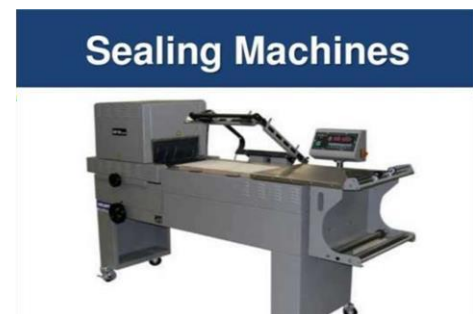


#### Sealing Section and Equipment's

Machines used to securely close and/or fasten the product usually after the filling section.

Some types of sealing equipments :-

- ☐ Food packaging machines.



- ☐ Vacuum packaging machines.
- ☐ Blister packaging machines.
- ☐ Skin Pack packaging machines.

### **Labeling Section and Equipments**

Any written, electronic, or graphic communications on the packaging or on a separate associated label.

Some types of Labeling equipments :-

- ☐ Flat class labeling machines.
- ☐ Round bottle labeling machines.
- ☐ Side of the class labeling machines.



### **End of the Line Section and Equipments**

After individual packages have been made the next step is getting the products ready for shipment.

Types of machines used :-

- ☐ Case/Box sealers.
- ☐ Sleeve wrappers and Bundlers.
- ☐ Case erectors and Box forming Machines.
- ☐ Case Packers.
- ☐ Palletizing Equipments.



## **3.2 IMPACT OF PACKAGING ON INDICES OF FAILURE**

### **MOISTURE TRANSFER**

Absorption or desorption of moisture can significantly affect the shelf life of foods. The main purpose of packaging is to protect the food from moisture ingress to preserve the product characteristics. In addition, the moisture may lead to deleterious changes such as structural transformations, enzymatic reactions, browning, and oxidation, depending on temperature and the availability of O<sub>2</sub>. Moisture or water vapour ingress in combination with light, O<sub>2</sub>, and an elevated temperature can result in physical loss of texture and caking due to lactose crystallization, microbial spoilage, non-enzymatic reactions, and fat oxidation.

## **OXIDATION**

A number of food components react chemically with O<sub>2</sub>, affecting the colour, flavour, nutritional status, and occasionally the physical characteristics of foods. In some cases, the effects are deleterious and reduce the shelf life of the food; in others they are essential to achieve the desired product characteristics. Packaging is used to exclude, control, or contain O<sub>2</sub> at the level most suited for a particular product. It is therefore not surprising that to prevent oxidation of lime; the packaging should provide a high-level O<sub>2</sub> barrier and be able to retain that barrier during the anticipated shelf life. Gas: flushing with a chemically inert gas such as N<sub>2</sub> may be essential to replace O<sub>2</sub> present in the package before closing. Most of the common spoilage bacteria and fungi require O<sub>2</sub> for growth. Therefore, to increase the shelf life of foods, the internal package atmosphere should contain a minimum concentration of residual O<sub>2</sub>.

## **LIGHT**

Light-induced degradation reactions in lime create a serious problem for the industry because of the development of off flavours, the decrease in nutritional quality, and the rate at which these phenomena develop. Packaging materials that can provide a barrier to light are essential to avoid this particular deteriorative reaction in fenugreek products.

## **THE RESPIRATION IN A PACKAGE IS INFLUENCED BY**

- Quantity of the produce
- Stage of maturity
- Temperature
- Concentration of ethylene gas
- Light intensity

## **THE PERMEATION OF THE PACKAGE IS INFLUENCED BY**

- Type and nature of material
- Thickness and surface area of the material
- Temperature and relative humidity
- Partial pressure gradients of O<sub>2</sub> and CO<sub>2</sub>

## QUALITIES OF PACKAGING MATERIAL

- Package must have sufficient mechanical strength to protect the contents during handling, transport, and stacking.
- Packaging material must be free of chemical substances that could be transferred to the produce and become toxic to man.
- Package must meet handling and marketing requirements in terms of weight, size, and shape.
- Package should allow rapid cooling of contents and prevent build up of heat.
- Mechanical strength of package should be largely unaffected by moisture content (when wet) or high humidity conditions.
- Package should be reusable, and biodegradable.
- Cost of package should be as low as possible.
- It must prevent spoilage during transit and storage.
- Labeling of package must indicate about quality, variety, date of packing, weight and price etc.
- It must be convenient in handling operations and to stack.

### 3.3 PACKAGING MACHINERY USE FOR LEATHER PACKAGING



MACHINE  
**Genyond**



**Labelling requirements**

1. Name of the food
2. List of ingredients
3. Nutritional information
4. Declaration regarding vegetarian or non vegetarian
5. Declaration regarding food additives
6. Name and address of the manufacturer
7. Net quantity
8. Code No/Lot No/Batch No
9. Date of manufacture and Best before or Use by date
10. Country of origin for imported food
11. Instructions for use.

## **CHAPTER 4**

### **FSSAI STANDARDS AND FOOD SAFETY**

#### **4.1 FSSAI STANDARDS AND ADDITIVES OF MANGO LEATHER**

##### **5.3.19 FRUIT BAR/ TOFFEE**

FSSAI's Food Products Standards & Food Additives regulations, 2011 defines the standards for fruit bar/ toffee under Regulation 5.3.19.

Fruit Bar/ Toffee means the product prepared by blending Pulp/Puree from sound ripe fruit, fresh or previously preserved, nutritive sweeteners, butter or other edible vegetable fat or milk solids and other ingredients appropriate to the product & dehydrated to form sheet which can be cut to desired shape or size.

##### **4.1.2.2 DRIED FRUITS, NUTS AND SEEDS**

Fruit from which water is removed to prevent microbial growth which includes dried fruit leathers (fruit rolls) prepared by drying fruit purees. Such as cashew nut, almond, raisins, dried apple slices, figs, copra (dried coconut whole or cut), dried shredded or flaked coconut, prunes, dehydrated fruits etc.

#### **4.1.1 FRUIT BAR SHALL CONFORM TO THE FOLLOWING ANALYTICAL STANDARDS**

1. Fruit bar should not contain more than 20 per cent moisture.
2. Total soluble solids content should not be less than 75 percent.
3. The fruit content of bar should not be less than 25 per cent.

#### 4.1.2 FOOD ADDITIVES FOR MANGO LEATHER

| <b>Food Category Name</b>           | <b>Food Additive</b>                               | <b>INS No</b> | <b>Recommended Maximum Level</b> |
|-------------------------------------|----------------------------------------------------|---------------|----------------------------------|
| <b>Dried fruits, nuts and seeds</b> | ASCORBYL ESTERS                                    |               | 80 mg/kg                         |
|                                     | BENZOATES                                          |               | 800 mg/kg                        |
|                                     | ETHYLENE DIAMINE TETRAACETATES (EDTA)              |               | 265 mg/kg                        |
|                                     | Diacetyltartaric and fatty acid esters of glycerol | 472e          | 10,000 mg/kg                     |
|                                     | HYDROXYBENZONATES, PARA                            |               | 800 mg/kg                        |
|                                     | Lauric arginate                                    | 243           | 200 mg/kg                        |
|                                     | ethyl ester                                        |               |                                  |
|                                     | Mineral oil, high viscosity                        | 905d          | 5,000 mg/kg                      |
|                                     | Mineral oil, medium viscosity, class I             | 905e          | 5,000 mg/kg                      |
|                                     | Calcium phosphate                                  | 341(i)        | 20,000 mg/kg                     |
|                                     | Magnesium phosphate                                | 343(ii)       | 20,000 mg/kg                     |
|                                     | SORBATES                                           |               | 500 mg/kg                        |
|                                     | SULFITES                                           |               | 1,000 mg/kg                      |
|                                     | Tartaric acid,                                     | 334           | GMP                              |

## **4.2 FOOD SAFETY**

Part I - General Hygienic and Sanitary practices to be followed by Petty Food Business Operators applying for Registration (See Regulation 2.1.1(2))

### **SANITARY AND HYGIENIC REQUIREMENTS FOR FOOD MANUFACTURER/ PROCESSOR/HANDLER**

The place where food is manufactured, processed or handled shall comply with the following requirements:

1. The premises shall be located in a sanitary place and free from filthy surroundings and shall maintain overall hygienic environment. All new units shall set up away from environmentally polluted areas.
2. The premises to conduct food business for manufacturing should have adequate space for manufacturing and storage to maintain overall hygienic environment.
3. The premises shall be clean, adequately lighted and ventilated and sufficient free space for movement.
4. Floors, Ceilings and walls must be maintained in a sound condition. They should be smooth and easy to clean with no flaking paint or plaster.
5. The floor and skirted walls shall be washed as per requirement with an effective disinfectant the premises shall be kept free from all insects. No spraying shall be done during the conduct of business, but instead fly swats/ flaps should be used to kill spray flies getting into the premises. Windows, doors and other openings shall be fitted with net or screen, as appropriate to make the premise insect free The water used in the manufacturing shall be potable and if required chemical and bacteriological examination of the water shall be done at regular intervals at any recognized laboratory.
6. Continuous supply of potable water shall be ensured in the premises. In case of intermittent water supply, adequate storage arrangement for water used in food or washing shall be made.
7. Equipment and machinery when employed shall be of such design which will permit easy cleaning. Arrangements for cleaning of containers, tables, working parts of machinery, etc. shall be provided.
8. No vessel, container or other equipment, the use of which is likely to cause metallic contamination injurious to health shall be employed in the preparation, packing or storage of food. (Copper or brass vessels shall have proper lining).
9. All equipments shall be kept clean, washed, dried and stacked at the close of business to ensure freedom from growth of mould/ fungi and infestation.
10. All equipments shall be placed well away from the walls to allow proper inspection.

11. There should be efficient drainage system and there shall be adequate provisions for disposal of refuse.
12. The workers working in processing and preparation shall use clean aprons, hand gloves, and head wears.
13. Persons suffering from infectious diseases shall not be permitted to work. Any cuts or wounds shall remain covered at all time and the person should not be allowed to come in direct contact with food.
14. All food handlers shall keep their finger nails trimmed, clean and wash their hands with soap, or detergent and water before commencing work and every time after using toilet. Scratching of body parts, hair shall be avoided during food handling processes.
15. All food handlers should avoid wearing, false nails or other items or loose jewellery that might fall into food and also avoid touching their face or hair.
16. Eating, chewing, smoking, spitting and nose blowing shall be prohibited within the premises especially while handling food.
17. All articles that are stored or are intended for sale shall be fit for consumption and have proper cover to avoid contamination.
18. The vehicles used to transport foods must be maintained in good repair and kept clean.
19. Foods while in transport in packaged form or in containers shall maintain the required temperature.
20. Insecticides / disinfectants shall be kept and stored separately and away from food manufacturing / storing/ handling areas.

### **4.3 LABELLING**

#### **Labeling Requirements**

All food products sold in India that are prepackaged are required to comply with the Food Safety and Standards (Packaging and labelling) Regulations, 2011. The Food Safety and Standards Regulation, 2011 is a notification issued by the Food Safety and Standards Authority of India under the Ministry of Health and Family Welfare. In this article, we look at the regulations pertaining to food labelling in India.

#### **Applicability of Food Labelling Regulations**

The food labelling regulations require all “Prepackaged” or “Pre-packed food” to comply with the labelling regulations in India. As per the rules, prepackaged food means food,

which is placed in a package of any nature, in such a manner that the contents cannot be changed without tampering it and which is ready for sale to the consumer.

## **General Labelling Requirements**

The following labelling requirements must be complied with by all prepackaged food sold in India:

- The label must be in English or Hindi or Devnagri language. In addition to the above, the label can contain information in any other language, as required.
- The label must not contain information about the food that could be deemed to be false, misleading, deceptive or otherwise create an erroneous impression regarding the product.
- The label must be affixed to the container in such a manner that it would not easily be separated from the container.
- The contents or information presented in the label should be clear, prominent, indelible and readily legible by the consumer.
- If the container is covered by a wrapper, then the wrapper must contain necessary information or make the label of the product inside readily legible by not obscuring.
- The name of the food must be mentioned along with the trade name and description of the food contained. In case the food contains more than one ingredient, then a list of ingredients must be presented in descending order of their composition by weight or volume, as the case may be, at the time of its manufacture;

## **Nutritional Information**

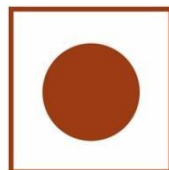
Nutritional Information or nutritional facts per 100 gm or 100ml or per serving of the product must be given on the label along with the following information:

- energy value in kcal;
- the amounts of protein, carbohydrate (specify the quantity of sugar) and fat in gram (g) or ml;
- the amount of any other nutrient for which a nutrition or health claim is made;
- It is important to note that any “health claim” or “nutrition claim” or “risk reduction” claim made in the label will be thoroughly scrutinized by the FSSAI authorities. Hence, any such claim must be validated by test data. As per the rules, the following is the definition for “health claim”, “nutrition claim” and “risk reduction” claim:

- “Health claims” means any representation that states, suggests or implies that a relationship exists between a food or a constituent of that food and health and include nutrition claims which describe the physiological role of the nutrient in growth, development and normal functions of the body, other functional claims concerning specific beneficial effect of the consumption of food or its constituents, in the context of the total diet, on normal functions or biological activities of the body and such claims relate to a positive contribution to health or to the improvement of function or to modifying or preserving health, or disease, risk reduction claim relating to the consumption of a food or food constituents, in the context of the total diet, to the reduced risk of developing a disease or health-related condition;
- “Nutrition claim” means any representation which states, suggests or implies that a food has particular nutritional properties which are not limited to the energy value but include protein, fat carbohydrates, vitamins and minerals;
- “Risk reduction” in the context of health claims means significantly altering a major risk factor for a disease or health-related condition;

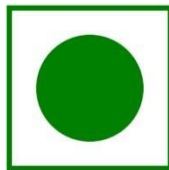
## **Veg or Non-Veg Symbol**

All packaged food that is “Non-Vegetarian” must have a symbol that is a brown colour filled circle inside a square with a brown outline. If a food contains only egg as a non-vegetarian ingredient, then the manufacturer may provide a declaration that the product contains only egg and add the non-vegetarian symbol.



## **Non-Veg Symbol**

Packaged vegetarian food should have a symbol that consist of green colour filled circle inside a square with green.



## **Veg Symbol**

## **Information Relating to Food Additives, Colours and Flavours**

Food additives contained in the food product must be mentioned along with class titles along with the specific names or recognized international numerical identifications. Addition of colouring matter should be mentioned on the label along with certain statements like “CONTAINS PERMITTED NATURAL COLOUR(S)”, just beneath the list of the ingredients on the label. In case of addition of extraneous flavouring agent, then it should be mentioned in a statement like “CONTAINS ADDED FLAVOUR” just beneath the list of ingredients on the label.

## **Name and Complete Address of the Manufacturer**

The name and complete address of the manufacturer must be mentioned on every package of food. In the case of imported food, the package must contain the name and complete address of the importer in India.

## **Net Quantity**

All packaged food must carry the net quantity by weight or volume or number, as the case may be. The net quantity of the commodity contained in the package must exclude the weight of the wrappers and packaging materials.

## **Lot Number of Batch Identification**

A lot number or batch number or code number must be mentioned on all packaged food so that it can be traced while manufacturing and distribution. Only bread and milk including sterilized milk are not required to comply with this regulation.

## **Date of Manufacture or Packing**

The date, month and year in which the commodity is manufactured, packed or pre-packed must be mentioned on the label. In the case of food products having a shelf life of more than three months, then the month and the year of manufacture can be given with the “Best Before Date”. In case of products having a shelf life of fewer than three months, the date, month and year in which the commodity is manufactured or prepared or pre-packed must be mentioned on the label with best before date.

### **Country of Origin for Imported Food**

For imported food, the country of origin of the food should be declared on the label of the food. In case a food product undergoes processing in a second country which changes its nature, the country in which the processing is performed should be considered to be the country of origin for the purposes of labelling.

### **Instructions for Use**

Instructions for use, including reconstitution, should be included on the label, if necessary, to ensure correct utilization of the food.

## ANNEXURE-1

### EQUIPMENT SUPPLIERS

All the machines and equipments are available from local manufacturers. The entrepreneur needs to ensure proper selection of product mix and proper type of machines and tooling to have modern and flexible designs. It may be worthwhile to look at reconditioned imported machines, dies and tooling. Some of the machinery and dies and tooling suppliers are listed here below:

|                                                                                                                                                                                   |                                                                                                                                                                                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Fry-Tech Food Equipments Private Limited</b><br>S. No. 4, Raviraj Industrial Estate,<br>Bhikhubhai Mukhi Ka Kuwa Bharwad Vash,<br>Ramol, Ahmedabad - 380024,<br>Gujarat, India | <b>Hindustan Vibrotech Pvt. Ltd.</b><br>Office No. 2, Ground Floor,<br>Vrindavan Building, Vile Parle East,<br>Mumbai – 400057,<br>Maharashtra, India                                     |
| <b>Electrons cooling systems Pvt. Ltd.</b><br>S-27, SIDCO Industrial Estate<br>Kakkalur Industrial Estate<br>Tiruvallur – 602003,<br>Tamil Nadu, India                            | <b>Springboard Enterprises India Ltd.</b><br>1st, 2nd & 3rd Floor,<br>Plot No. 7, 8 & 9,<br>Garg Shopping Mall,<br>Service Centre, Rohini Sector 2<br>New Delhi – 110085,<br>Delhi, India |
| <b>Flour Tech Engineers Private Limited</b><br>Plot No. 182, Sector 24,<br>Faridabad - 121005,<br>Haryana, India                                                                  | <b>P Square Technologies</b><br>3, Swami Mahal,<br>Gurunank Nagar,<br>Off. Shankarsheth Road Bhavani Peth,<br>Pune - 411002,<br>Maharashtra, India                                        |
| <b>Ricon Engineers</b><br>10 To 13, Bhagwati Estate,<br>Near Amraiwadi Torrent Power,<br>Behind Uttam Dairy,<br>Rakhial, Ahmedabad - 380023,                                      | <b>Kamdhenu Agro Machinery</b><br>Plot No. 6, Near Power House,<br>Wathoda Road Wathoda,<br>Nagpur - 440035,<br>Maharashtra, India                                                        |



## Contact Us

### **National Institute of Food Technology, Entrepreneurship and Management (NIFTEM) - Thanjavur**

(an Institute of National Importance under Ministry of Food Processing Industries, Government of India)

Pudukkottai Road, Thanjavur – 613005, Tamil Nadu, India

Ph: 04362-228155, Fax: 04362-227971

Email: [director@iifpt.edu.in](mailto:director@iifpt.edu.in) Web: <https://niftem-t.ac.in/>

