PM Formalisation of

Micro Food Processing Enterprises Scheme

HANDBOOK OF
DEHYDRATED FENUGREEK LEAVES

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

Fenugreek (*Trigonella foenum-graecum L.*) is an annual diploid species, popularly known by its vernacular name “methi” belonging to the sub-family “Papilionaceae” of the family “Fabaceae”. It is native crop of the countries bordering the eastern shores of Mediterranean region and extended to central Asia. Fenugreek leaves are an ancient spice used for flavoring various dishes. The leaves have a bitter taste, but when added to the recipe, titillate the taste buds. Apart from the dried leaves, the green leaves and the seeds are also commonly used while cooking. The yellow-amber coloured seeds are added in the preparation of pickles, vegetables, and spice mixes like sambar powder. Fenugreek seeds are available both in powdered and grounded form. The seeds are roasted to reduce the bitterness and enhance the aromatic flavor. The herb is also sold in powdered form or dried leaves form which can be bought and powdered.

1.2 AREA AND PRODUCTION

India is the largest producer of fenugreek in the world. It is being cultivated in an area of 123.4 thousand hectares, with the production of 130.8 thousand MT and productivity of 1.1 MT/ha. In India, the major fenugreek producing states where fenugreek is grown on commercial scale are Rajasthan, Gujarat, Uttarakhand, Uttar Pradesh, Madhya Pradesh, Maharashtra, Haryana and Punjab. From the world production of fenugreek, it can be estimated that more than

half is produced in India. India consumes domestically 90 percent of its own production and claims 70-80 percent of the world exports in fenugreek.

Fenugreek is primarily used as a spice in countries where it is grown. The seeds and green leaves of fenugreek are used in food as well as in medicinal application that is the old practice of human history. It has been used to increase the flavoring and color, and also modifies the texture of food materials. Seeds of fenugreek spice have medicinal properties such as hypocholesterolemic, lactation aid, antibacterial, gastric stimulant, for anorexia, antidiabetic agent, galactogogue, hepatoprotective effect and anticancer. These beneficial physiological effects including the antidiabetic and hypocholesterolemic effects of fenugreek are mainly attributable to the intrinsic dietary fiber constituent which have promising nutraceutical value. It is well known for its fiber, gum, other chemical constituents and volatile contents. Dietary fiber of fenugreek seed is about 25% which changes the texture of food. These days it is used as food stabilizer, adhesive and emulsifying agent due to its high fiber, protein and gum content.

1.3 STRUCTURE OF FENUGREEK PLANT

It is a dicotyledonous plant with branched stems with trifoliate leaves and it bears white flowers which produce golden yellow seeds. Its seed contains 45-60 % carbohydrates, mainly mucilaginous fiber (galactomannans), 20-30 % proteins high in lysine and tryptophan, 5-10 % fixed oils (lipids), pyridine alkaloids mainly trigonelline (0.2-0.38 %), choline (0.5 %), gentianine and carpaine, the flavonoids-apigenin, luteolin, orientin, quercetin, vitexin and isovitexin, free amino acids, such as 4-hydroxyisoleucine (0.09 %), arginine, histidine and lysine, calcium, iron, saponins (0.6-1.7%), glycosides yielding steroidal sapogenins on hydrolysis (diosgenin, yamogenin, tigogenin, neotigogenin), cholesterol and sitosterol, vitamins A, vitamin B1, vitamin C and nicotinic acid.

1.3.1 CHEMICAL COMPOSITION OF FENUGREEK LEAVES

Nutritional value per 100 g (3.5 oz)	
Energy	1,352 kJ (323 kcal)
Carbohydrates	58 g

Dietary fiber	25 g
Fat	6.4 g
Protein	23 g
Vitamins	Quantity%DV†
Thiamine (B1)	28%, 0.322 mg
Riboflavin (B2)	31%, 0.366 mg
Niacin (B3)	11%, 1.64 mg
Vitamin B6	46%, 0.6 mg
Vitamin C	4%, 3 mg

1.3.2 PHARMACOLOGICAL PROFILE OF FENUGREEK LEAVES

1. Antiadhesive properties
2. Anticarcinogenesis effects
3. Antitumor activity
4. Antioxidant activity
5. Antiplatelet activity
6. Exercise recovery effects
7. Hepatoprotective activity
8. Lipid-lowering effects
9. Galactagogue effects
10. Analgesic effects

CHAPTER 2

DEHYDRATION OF FENUGREEK LEAVES

2.1 FENUGREEK LEAVES PROCESSING

Fenugreek leaves can be cleaned and packaged as whole or precut forms for fresh use. Minimally processed ready-to-use fresh produce is more perishable than intact produce. Thus, it is important to start with a high quality raw material and strictly apply the necessary processing and storage requirements for such products. Minimally processed fenugreek product can be fresh, whole baby or regular leaves and fresh-cut leaves packaged in modified atmosphere conditions among which the former is more common. After the leaves are trimmed, sorted, and cleaned with sanitizers as described in the previous section, the leaves are usually used as intact (individual baby leaves) or can also be cut into smaller pieces (not common in practice) for further processing. It is important to note that cutting must be done with sharp knives to decrease the degree of physical injuries to the tissues. The cut leaves may be treated with antimicrobial and antioxidant solutions to retard microbial and oxidative degradations in the product. If whole intact leaves are to be packaged, they must be rinsed with water containing appropriate sanitizers to reduce the microbial load on them. Excess surface water on the leaves must be removed by centrifugation with a spinner before packaging. Moisture on the surface can increase microbial decay of the product.

Fenugreek is consumed as fresh or processed into different forms including frozen, canned, or dried.

Frozen Fenugreek

Fenugreek can be frozen to increase its shelf life. Freezing inhibits growth

of microorganisms and retards degradative biochemical and enzymatic reactions in the product. The process involves sorting, trimming, washing, blanching, draining, freezing, and packaging. Frozen fenugreek can be presented in one of the following forms: whole fenugreek (intact plant with roots removed), leaf fenugreek (whole leaves separated from the root crown), cut-leaf fenugreek, and pureed fenugreek. Thus, depending on the type of the product to be produced, a size reduction is applied to trimmed, sorted/graded, and cleaned fenugreek.

Blanching is one of the most critical steps in freezing of fenugreek. It involves brief immersion of the fresh product in water at 85–100◦C or steaming at 100◦C primarily to inactivate enzymes such as lipoxygenases (LO), peroxidases (PO), and polyphenol oxidases (PPO), which cause degradations in color, flavor, texture, and nutritional value. It also kills vegetative microbial cells and decreases any pesticide residues on the product.

Blanched fenugreek is cooled and usually packaged before freezing, although individual quick freezing of unpackaged fenugreek can also be done followed by packaging.

Dehydrated Fenugreek

Large-leafed fenugreek is preferred for production of dehydrated fenugreek. The fenugreek is trimmed and sorted carefully to remove roots, older yellowed or decayed leaves before washing. The leaves are dried at 80◦C until the moisture content drops to below 6.5%. Drying can also be conducted with microwaves at 750 W power level, which can be advantageous in terms of drying time, energy consumption, ascorbic acid, and color. Premium quality dried fenugreek can be produced by freeze drying which retains the valuable nutrients and color to a larger extent.

Canned Fenugreek

Harvested fenugreek in crates, directly from the field or in boxes, can be preserved by canning. Fenugreek is trimmed, sorted, and graded to remove the crowns, heavy stalks, decayed and yellowed leaves followed by washing. Washing is generally done by passing the leaves through a revolving reel immersed in water with additional sprays or through a tank on a mesh belt to remove soil, dirt, and insects thoroughly.

2.1.1 HARVESTING OF FENUGREEK LEAVES

Fenugreek is harvested before the seed stalks develop. Whole plant is cut off the tap root for fresh market while it is cut off about an inch above the soil for processing by different machines. Fenugreek should not be harvested after heavy rain as the leaves become crisp and sensitive to break when wet. Leaves and stems should be protected from damaging and bruising during harvesting and handling. Rotten and yellow leaves should be discarded at the time of harvest as these leaves can adversely affect the quality of fresh leaves.

Fenugreek loose moisture rapidly and sag, so it should be harvested in cooler periods of the day. Fenugreek is usually washed, repacked in round baskets, crates, and humpers, and iced in a central lo- cation before shipping in refrigerated vehicles to storage areas or retail stores. Fenugreek is recommended to be cooled rapidly upon harvesting and is recommended to be stored, distributed, and retailed at temperatures near 0◦C at high relative humidities (95–98% RH). Major quality losses in fenugreek during storage include wilting, yellowing, decay, and vitamin C loss.

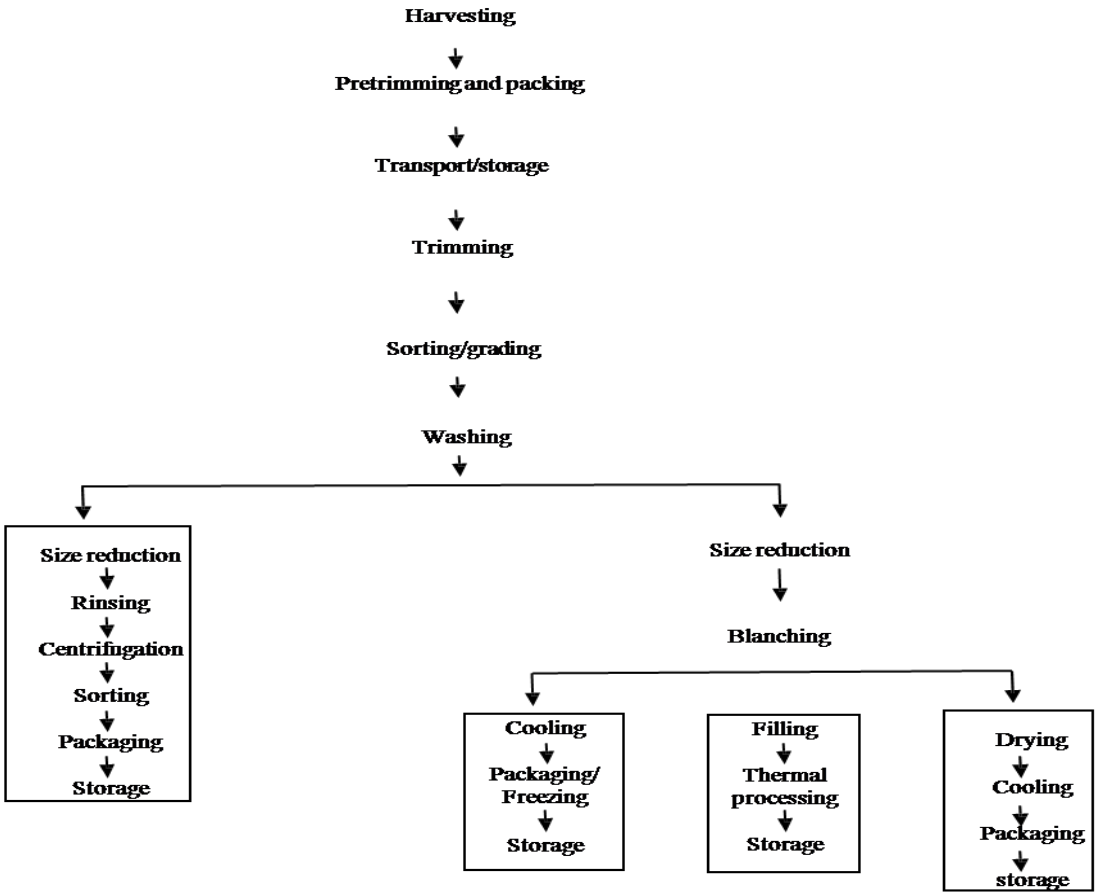
After harvesting of fenugreek it bounded in ‘Judi’ and packed in cloth or netted bags or put in bamboo basket. After the seeds have matured, uproot the

plants and hang to dry. When seeds are completely dry, thresh and separate them. Grind seeds if required. Store whole dried seeds or ground fenugreek powder in airtight containers.

2.2 NEED OF PROCESSING

Fenugreek leaves are highly perishable due to their high moisture content ranges from (80- 92% w.b) and available for very short period of time. This creates a considerable gap between demand and non-availability. The storage life of green leafy vegetables is extremely short and varies form few hours to 2-3 days depending upon the temperature and the relative humidity of the storage condition. In proper post harvest handling leads to the loss of large amount (around 32%) of vegetables.

Due to its high perishability and round the year demand almost it needs to be processed into dehydrated form. The various methods of dehydration of fenugreek leaves are sun drying, shade drying, fluidized bed drying, tray drying and microwave drying etc.



The processing steps are shown in Figure 1.

2.3 BLANCHING

Blanching are necessary steps in the processing of vegetables and the partial cooking which the vegetable are heated on water before processing to dehydration, freezing etc. It can be carried out in different methods like water blanching, steem blanching, microwave blanching etc. to inactivate the enzyme, remove raw or bitter flavour, stabilize the colour and texture, reduce bacterial load and desirable additives. Blanching increases the carotenoid content, reduce the non enzymatic browning and encouraged carotenoid destruction.

Three methods of fenugreek blanching

1) WATER BLANCHING

Water blanching is one of the most critical steps in freezing of fenugreek. It involves brief immersion of the fresh product in water at 85–100◦C primarily to inactivate enzymes such as lipoxygenases (LO), peroxidases (PO), and polyphenol oxidases (PPO), which cause degradations in colour, flavour, texture, and nutritional value. It also kills vegetative microbial cells and decreases any pesticide residues on the product. Blanching at 90◦C for 1 minute has been recommended for fenugreek.

2) STEEM BLANCHING

During steem blanching, steaming of fenugreek leaves at 100◦C takes place. Steam blanching can used to reduce leakage of nutrients from the leaves and wastewater.

3) MICROWAVE BLANCHING

Blanching can also be conducted with microwaves at 750 W power level, which can be advantageous in terms of energy consumption, ascorbic acid, and color.

2.5 DEHYDRATION/ DRYING TECHNIQUES

2.5.1 Methods of fenugreek leaves Dehydration

Sun Drying: -

This is a traditional method of drying of crops and grains and probably being followed by the farmers since man has developed art of cultivation. Still, in India, major portion of crops is left in the field and threshing yard for drying under. Sun is a very large nuclear fusion reactor, which converts 40 lakhs tones of hydrogen to helium in one second. Although earth absorbs a minute portion of sun

energy, but the amount of energy received is approximately of 5.4 Joule/yr.

Shade Drying: -

Shade drying requires full air circulation. It should not be undertaken inside conventional buildings, but in an open side shed purposely built for shade drying most products are to be dried are sliced as sliced products dry thoroughly and quickly. The materials should be placed on meters or tray and well above the ground in order to avoid contamination from dust or soil. The material is stirred occasionally to ensure faster drying.

The principles for shade drying are the same as for sun drying under dry conditions when there is a good circulation of dry air, shade drying takes more time then is normally required for drying in full sunlight. The limitation of shade drying is that drying cannot be accomplished in rainy season and when initial moisture content of product is higher.

Fluidized bed drying: -

In this method of drying, products are being denied under fluidized bed dryer. The samples are fluidized by drying air with sufficiently high velocity to cause suspension. In this drying process, higher rates of moisture migration take place. Since every surface of product is in contact with drying air, uniform drying of product take place.

This method is normally used for the materials, which have high initial moisture content and are to lighter and the same time requires to be dried quickly such as vegetable leaves. The fluidized bed drying technique yields an important position among modern drying methods. It is used mainly for granular material; it is also applicable in the drying of solutions, pasts and liquids sprayed in to the fluidized bed.

The principle of operation of fluidized bed dryer is to provide sufficient air pressure to fluidize a thin bed of grain/ product being excellent air/grain contact.

Tray Drying: -

In a tray dryer, many shallow trays are kept one above the other with a gap in between, in the drying chamber. Tray dryer are generally used for drying of vegetable and similar semi perishables. The tray may or not have perforated bottom. Perforated trays are used when the platinum chamber is at the bottom of drying chamber. It the hot air is coming from the sides of the drying chamber the trays may not have perforated bottom. The gap in between the group of trays permits air ventilation. Products are kept in the layers in the tray.

Microwave Drying: -

Microwave drying is a drying technique which is currently available in fresh leaves processing industry Wray. It allows rapid evaporation of water from food, providing relatively shorter drying times compared to many drying methods (convective drying, shade and sun drying, freeze drying) and decreased energy consumption in the drying process. Microwave-dried products showed less shrinkage, better color and rehydration capacity compared to hot-air drying. The quality of microwave-dried products is influenced by drying parameters such as microwave power (W), drying time, the initial moisture content of the product, and the dielectric properties of the materials.

CHAPTER 3

PACKAGING OF DEHYDRATED FENUGREEK LEAVES

Food packaging is the enclosing of food for the purpose of protection and preservation. Fenugreek 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 Fenugreek and attractive design for marketing and branding.

In today's competitive world, packaging plays a crucial role in creating value added consumer friendly, self-selling packs. **Dehydrated Fenugreek** is added to multiple cuisines, for adding the flavor. Good for upset stomach, constipation and inflammation of the stomach.

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

Deteriorative factors for dehydrated fenugreek

- ❑ Moisture Content
- ❑ Weight
- ❑ Chlorophyll Content
- ❑ Aroma
- ❑ Flavonoids Content

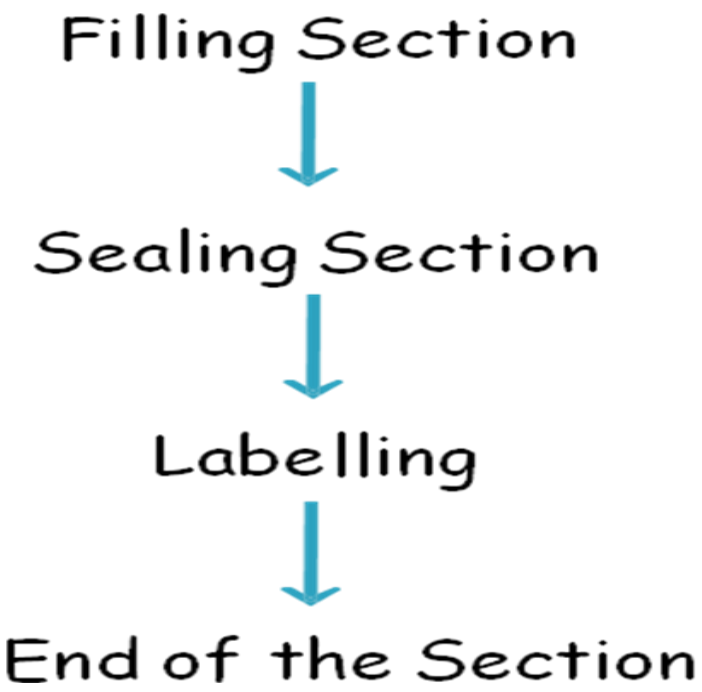
3.1 NEED OF DEHYDRATED FENUGREEK LEAVES PACKAGING

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 fenugreek leaves.

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 PACKAGING PROCESS OF DEHYDRATED FENUGREEK LEAVES



The packaging steps are shown in Figure 2.

Filling Section and Equipments

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 Equipments

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.

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

3.2.1 MOISTURE TRANSFER

Absorption or desorption of moisture can significantly affect the shelf life of foods. This is particularly the case for dry leafy products such as fenugreek leaves. The main purpose of packaging is to protect the leaves 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_2. Moisture or water vapour ingress in combination with light, O_2, 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.

3.2.2 OXIDATION

A number of food components react chemically with O_2, 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_2 at the level most suited for a particular product. It is therefore not surprising that to prevent oxidation of fenugreek leaves; the packaging should provide a high-level O_2 barrier and be able to retain that barrier during the anticipated shelf life. Gas: flushing with a chemically inert gas such as N_2 may be essential to replace O_2 present in the package before closing. Most of the common spoilage bacteria and fungi require O_2 for growth. Therefore, to increase the shelf life of foods, the internal package atmosphere should contain a minimum concentration of residual O_2.

3.2.3 LIGHT

Light- induced degradation reactions in fenugreek 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.

3.3 SHELF LIFE OF DEHYDRATED FENUGREEK LEAVES IN DIFFERENT PACKAGES

Shelf life is defined as the period between production and the time the food item loses its state of safe and satisfactory quality in terms of nutritional value, microbial status: flavour, texture, and appearance. The packaging plays a fundamental role in maintaining the quality and therefore the shelf life of foods. The package is an integral part of the preservation system and functions as an interface between the food and the external environment; the package should be designed and developed not only to contain the food product but also to protect it and add value to it, as its design may directly affect the purchase decision of the consumer.

For retailing to consumers, dehydrated leaves are packed into either in high density polyethylene bags and/or cartoon boxes with aluminium layer. The type and construction of the package depends on the type of dehydrated leaves (the surface area: volume ratio of the package, the desired shelf life, the ambient storage and transport environment, and the anticipated market environment.

3.3.1 TYPES OF PACKAGING MATERIALS USED FOR DEHYDRATED LEAVES

1) Consumer / Retail packs

Consumer packages are small in size and designed to hold ½ kg to 2 kg of vegetables. The selection criterion for the type of consumer pack depends on marketing characteristics of the product.

Packaging fenugreek leaves in polyethylene bags has been highly popular for a long time, particularly for retail packaging. For example, Fenugreek leaves are packed in plastic pouches of different capacity with ventilation holes and then placed in 3-Ply CFB box.

2) Transport / Bulk packs

Transport packages are designed for long distance transportation in capacities ranging from 4 – 5 kgs to 20 – 25 kgs. These packs must withstand impacts, compression and vibration during transport.

3.3.2 THE RESPIRATION IN A PACKAGE IS INFLUENCED BY

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

3.3.3 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 O2 and CO2

3.4 PACKAGING MACHINERY USE FOR DEHYDRATED FENUGREEK LEAVES PACKAGING

Fenugreek Sorting Machines

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

FSSAI STANDARDS AND ADDITIVES REGULATION 2011

4.1 DEHYDRATED VEGETABLES

2.3.36: DEHYDRATED VEGETABLES

FSSAI's Food Products Standards & Food Additives regulations, 2011 defines the standards for Dehydrated Vegetables under Regulation 2.3.36. Dehydrated Vegetables means the product, prepared from edible portions of suitable variety of sound vegetable, free from insect or fungal infection, free from blemishes, suitably prepared, from which moisture has been removed under suitable conditions of temperature, pressure, humidity & airflow, to the extent that the product is preserved by any suitable method.

It may be whole, sliced, quarters, pieces, flakes, kibbled granules or powdered. The finished product shall have uniform colour and shall be free from discoloration due to scorching or enzymatic reaction. It shall be free from stalks, peels, stems and extraneous matter. When in powder form, it shall be free flowing and free from agglomerates.

4.1.1. GREEN LEAFY VEGETABLES SHALL CONFORM TO THE FOLLOWING ANALYTICAL STANDARDS

1. Moisture (on dry basis) m/m Not more than 7.0 percent
2. Sulphur Dioxide not more than 2000 ppm
3. Peroxidase test should be negative

4. Ash insoluble in dilute HCl not more than 0.5 percent

2.1: METAL CONTAMINANTS

Dried or dehydrated vegetables (other than onions) shall not contain Lead more than 5.00 Parts per Million (mg/kg or mg/L).

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 bet 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.

Contact Us

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