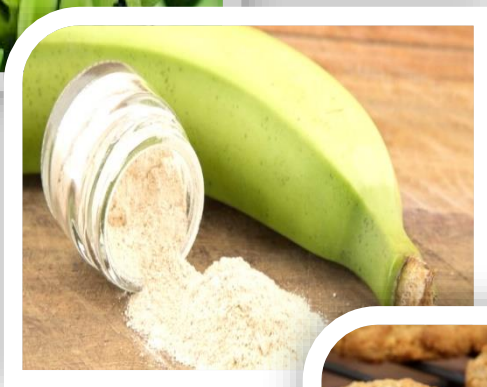




PREPARATION OF BANANA FLOUR COOKIES

FME – SKILL TRAINING



Indian Institute of Food Processing Technology
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PREPARATION OF BANANA COOKIES

Introduction

Banana (Musa sp.) is one of the widely consumed fruit all over the world. It is a rich source of various nutritional constituents includes iron, phosphorous, potassium, calcium and vitamins.

COMPOSITION OF PLANTAIN (RAW BANANA)

Constituent	Raw banana (Plantain variety)
Water (%)	66.4
Protein (%)	1.1
Fat (%)	0.4
Carbohydrates (%)	31.2
Ash (%)	0.9
Calcium (mg/100g)	7
Phosphorous (mg/100g)	30
Iron (mg/100g)	0.7
Sodium (mg/100g)	5
Thiamin (mg/100g)	0.06
Riboflavin (mg/100g)	0.04
Vitamin – C (mg/100g)	14
Niacin (mg/100g)	0.6

India is the largest producer of banana in the world and it contributes 25.7 % to the world’s banana production. India grows 32 million metric tonnes of banana and it covers 13% of the total farmland in the country. Over 90% banana are domestically used and 10% are subjected to processing.

It is a highly perishable fruit owing to its high moisture content and climacteric nature. Though India is the major producers of banana there is a significant loss in the food value of banana due to improper postharvest management practices. Appropriate food processing techniques can be used to convert them from perishable to semi-perishable product with the shelf stability of 3-6months. The processing of banana adds value to the product where farmer or trader can get better price.

VALUE ADDED COOKIES

Cookies are made using 40-60% fat and 50-60% sugar. Banana cookies is an attempt to utilize the banana crop for producing value added products with increased nutritional value. It may help the entrepreneurs to strengthen the handling and processing of banana industry. Banana cookie is a baked food product that is typically small, flat and sweet. Made from banana flour (high

starch content) with higher amount of fat and sugar. It requires long baking time with relatively low baking temperature. High humidity is required in the first baking zones to allow the dough to spread on the oven band.

Banana cookies manufacturing process involves three steps includes

- 1) Mixing
- 2) Shaping or forming
- 3) Baking

Mixing

Mixing is a process designed to blend different ingredients into a uniform and homogenous mixture. The major ingredients are flour, fat and sugar. All measured ingredients are put together for dough formation. Prepared dough is fed into mixers where mixing is done and dough is prepared for moulding/cutting.

Shaping and Forming

The forming process is specific for each cookie type. There are three processes by which shaping or forming of cookies is achieved-

- 1) Sheeting and cutting
- 2) Rotary moulding
- 3) Extrusion

Sheeting and cutting method:

This method of forming is used for the production of crackers, semisweet cookies and selected soft doughs.

Rotary molding:

The rotary molding process offers advantages over sheeting and cutting that there is no scrap to recycle and very less labour requirement. This process is used for dry and crumbly doughs only.

Extrusion method:

In this method of dough forming, the dough is extruded through a row of dies which is cut by a wire or blade mounted on a frame that moves through the dough just below the die nozzle outlet.

Baking

This is the area where we pass these moulded/ formed wet cookie into baking oven. The cookies are baked on desired temperatures (160°C - 220°C).

Various type of heating are available now-a-days as per the convenience and cost. Different types of oven are available for baking products.

Changes occur during baking of cookies

During baking cookie structure and texture are formed in three zones. In the first baking zone

1st Baking Zone

Initially as the dough enters the oven, the fat melts, sugar and chemicals start dissolving in water. The whole cookie piece becomes soft and fluid. Aerating chemicals start generating carbon dioxide. Heat causes the carbon dioxide as well as the air present in the liquid to expand, resulting a volume increase in the cookie. These changes take place over an extended period.

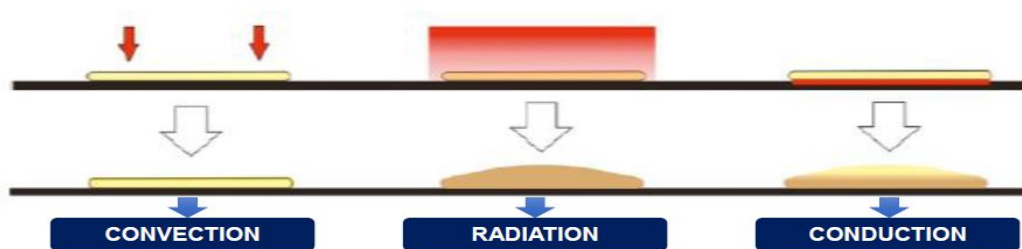
2nd Baking Zone

As the temperature approaches boiling point, the proteins coagulate and initiate structure formation. This is followed by partial gelatinisation of starch (as there is not sufficient water present for complete gelatinisation). When boiling point is reached, the water present is converted to steam and assists in increasing the volume and a maximum volume is achieved at this stage.

Final stage

At this stage, dextrins are formed and sugar caramelizes. Basic structure of cookie is determined by the coagulated protein, the partially gelatinized starch and the remaining water. The cookie is still flexible and delicate owing to the fat that fat is still in liquid and the sugar are in the syrup form.

Modes of heat transfer occur during baking



Convection : Moisture evaporation occurs from the surface by dry air.

Radiation : Moisture reduction from the centre to surface takes place

Conduction : Heat transfer directly to the base. Good spread of cookies occurs.

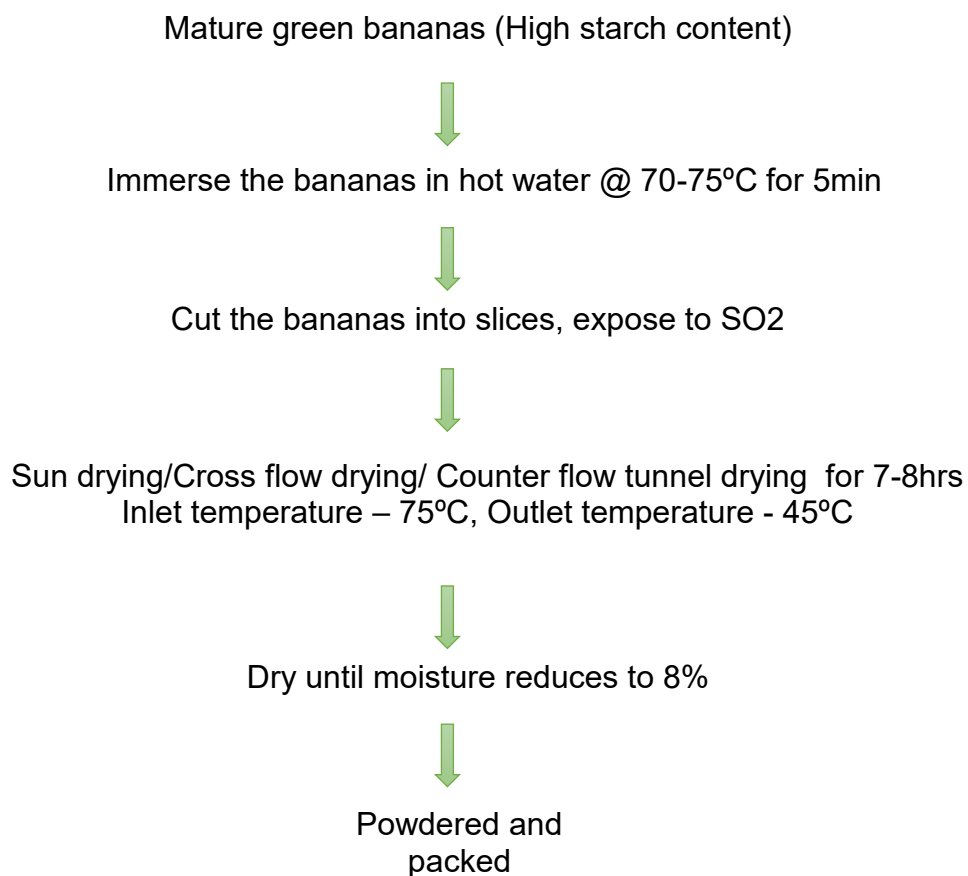
Cooling

The hot product obtained from baking must be cooled to room temperature prior to packaging for several reasons-

- Being warm, reduced firmness of the baked product so as to withstand packaging process
- Packaging material shrinkage due to contact to hot product
- Hot packed product may continue release some steam causing condensation inside the packaging.

Cooling can be achieved either by placing the baked product at ambient conditions or by forced air cooling.

Process flow of banana flour



Ingredients for making banana cookies:

- | | | |
|------------------|---|-------|
| 1) Banana flour | - | 1 kg |
| 2) Butter | - | 500g |
| 3) Icing sugar | - | 500g |
| 4) Water | - | 180ml |
| 5) Baking powder | - | 10g |

ROLE OF INGREDIENTS USED FOR MAKING BANANA COOKIES

1) Flour starch:

- ☐ Provides rigidity and texture of the product.
- ☐ Dextrinization induces colour of the cookies

2) Flour protein:

- ☐ Strengthens and elasticity.
- ☐ Dextrinization induces colour of the cookies

3) Baking powder:

- ☐ Releases CO₂ from the wet dough and allows them to expand
- ☐ Increase the volume and lightens the texture.

4) Sugar

The commonly used sugar is sucrose, which is manufactured from sugar cane or sugar beet. It is available in varying particle size such as granulated, castor and icing. Castor or powdered sugar is used for cookies. Controlled hydrolysis of starch gives glucose at various levels.

- ☐ It imparts sweet taste to cookies
- ☐ It has softening action on the flour
- ☐ It contributes to the colour of cookie
- ☐ It hardens the cookie texture

5) Butter

It has a unique flavour and act as lubricants. It helps in providing texture and structure to the cookies. It also act as a aerating agent and improves eating quality (Palatability). Butter also prove as a moisture barrier in finished cookies.

6) Water

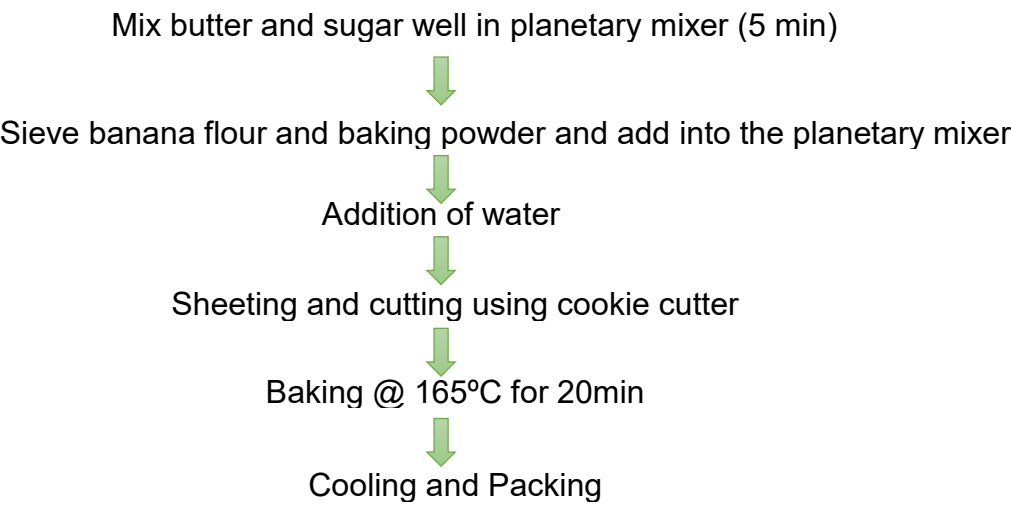
Water plays an important role in cookie making. It is added in the dough stage and driven out in the baking stage. Between the time of its addition and removal it has a number of functions.

- (1) It hydrates the flour particles and helps in the formation of dough suitable for further processing.
- (2) It helps to dissolve salt, chemicals, sugar, water soluble colour and flavour and to distribute the dissolved materials throughout the dough.
- (3) It helps in the aeration of cookie to certain extent by the formation of steam.

Among all the ingredients used in cookie, water has the highest specific heat (1.0) and hence the effect of water temperature on the initial dough temperature can be very significant, Therefore it is useful to control

the water temperature particularly in short and soft dough as chilled water can help to keep the dough temperature lower especially in hot weather and make the dough processing easier. Usually soft water or softened water is used.

PROCESS FLOW FOR BANANA COOKIES

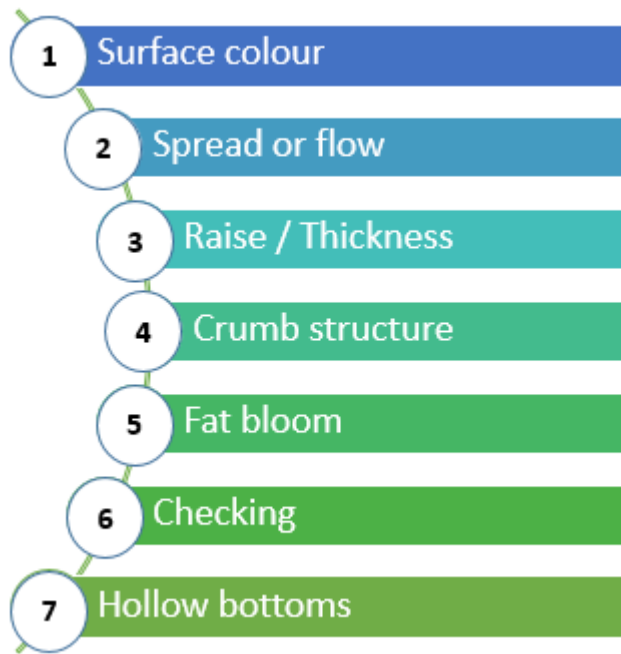


BANANA COOKIES PROCESSING



FAULTS AND REMEDIES OF COOKIES

Quality of cookies are determined by the following parameters



1) Surface colour

- ☐ Uniform colour is desired
- ☐ Too dark or too light colour of cookies affect consumer appeal

2) Spread or flow

- ☐ Faulty spreading of dough during baking affects shape and appearance.
- ☐ Changes in dimensions causes problems during packaging.

3) Raise / Thickness

- ☐ Dough raising is affected by baking temperature and aerating chemicals.
- ☐ Good raise helps in attaining proper crispiness and texture of cookies

4) Crumb structure

Cookies has no protein network but conglomeration of protein and starch is linked together by pockets of fat.

5) Fat bloom

- ☐ Development of tiny white spots during storage is termed as “Fat bloom”
- ☐ This may be due to the uneven crystallisation of fat after cooling.

6) **Checking**

- ❑ Checking is the hard line cracks formed on the surface of cookies.
- ❑ Cracks appears after baking spoils consumer appealing may be due to the over mixing or sudden cooling.

7) **Hollow bottom**

- ❑ Hollowness is caused by gas or air formed between cookies and steel band or by distorted cookies structure.
- ❑ This may affect the crumb structure of cookies and will cause low weight.

8) **Others**

Foreign materials like metal pieces, toxic chemicals, stones etc should be detected.

Conclusion :

Processing helps in reducing post-harvest losses of banana. Value addition of banana increase the nutritional profile of cookies. Cookies made of banana flour is easily digestible than other grain flour and known to cure ulcers. It Offers opportunity for the farmers/traders to produce the sustainable food product with better taste and quality.

PACKAGING REQUIREMENTS OF BANANA COOKIES

Packaging is defined as —the enclosure of products, items, or packages in a wrapped pouch, bag, box, cup, tray, can, tube, bottle, or other container to perform the following functions: containment; protection or preservation; communication; and utility or performance. If the device or container performs one or more of these functions, it is considered a package.

Packaging functions range from technical ones to marketing oriented ones as shown in the following Table

Technical Functions		Marketing Functions	
contain	measure	communicate	promote
protect	dispense	display	sell
preserve	store	inform	motivate

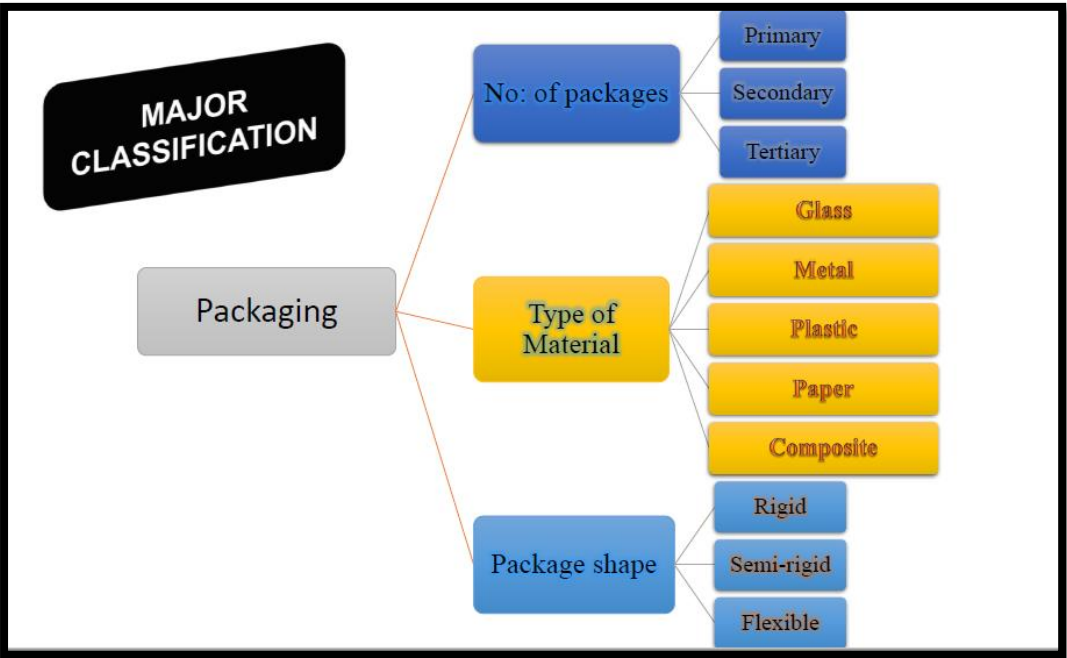
Indian Packaging Industry

The market volume of the Indian packaging industry amounts to about Rs. 77,570 crore and has constantly grown by approximately 15 percent year per year. The Indian packaging industry contributes nearly 2 per cent to the country's overall GDP. Every sector of user industry has become package conscious and the need for scientific, functional and aesthetic packaging is being realized. Dramatic change is observed bringing overall revolution in packaging concept, style and forms. New concepts like aseptic packaging, system packaging, thermoforming, inpack sterilization of foods have taken industrial footing in Indian market.

NEEDS OF PACKAGING

- Packaging helps in protecting and containing the products until it reach the consumers.
- It also provides us with important product information about nutrition and storage.
- To make goods reach safely
- For advertisement or branding
- To prevent contamination

MAJOR CLASSIFICATION OF PACKAGING



PRIMARY PACKAGING

- Envelops and holds the product.
- Direct contact with the cookies.

SECONDARY PACKAGING

- Used to group the primary packages
- Present outside the primary unit.

TERTIARY PACKAGING

- Used for handling of bulk during storage and transport.
- Carton palletized unit of secondary package.

Package for any product is selected based on their characteristics and stability.
The characteristics of banana cookies are listed below:

- ▣ Dry bakery products
- ▣ Moisture content (<2-3%)
- ▣ Low water activity ($A_w = 0.30$)
- ▣ RH (10-15%)

HAZARDS, DAMAGES AND PROTECTION OF PACKAGING MATERIAL

SN	Storage	Hazard	Damage	Protection
I	Handling and transportation	Drop, shunting, shocks, vibrations, stack load, compression etc.	Breakage, loss of shape, dusting, seepage	Cushioning, blocking.
II	Storage	Stack load, compression, Attack by rodents and insects	Crushing, distortion sticking, spillage, contamination, spoilage	Adequate compression strength of package. resistance and repulsiveness to insects

III	Environment during storage transportation and distribution	Biological or otherwise	Contamination	Toughness of packaging material (to resist penetration).
		High/low humidity moisture/water.	Physical, chemical and biological deterioration due to loss/gain of moisture	Efficiency of closure providing. Water vapour barrier properties.Package desiccant etc.
		O ₂	Oxidative rancidity	O ₂ BARRIER VACUUM – O ₂ N ₂ /CO ₂ flushing packaging in impermeable package
		Light U.V. rays	Vitamin Destruction, Off flavour development, Oxidative	Use of opaque or colour like Yellow, red, brown, etc. for packaging material.
			rancidity, Bleaching of pigments	
	Storage	Temperature	Change of state, Increase of moisture ingress Increased rate of deterioration	Heat insulation Use of poor conductor Use of reflective insulation
		Time	Gradual and slow changes occur and staling and other deteriorative changes occur	Early/immediate marketing (FIFO) Proper schedule of dispatching order providing Heat insulation Use of Barrier material

Hence based on the hazards and damages it is very important to select appropriate package for banana cookies. Some of the basic requirements for packaging of cookies are given below:

- ☞ Oxygen exchange from within and outside a package
- ☞ Water vapour permeability of packages
- ☞ Aroma impermeability characteristics of packaging materials
- ☞ Resistance to seepage of fats and oils
- ☞ Protection against deteriorative visible and ultra violet radiation
- ☞ Good printability and appearance
- ☞ Physical, mechanical protection to the products against shocks, crushing and vibrations
- ☞ Compatibility and safety of the packages

Packaging of cookies

A wide range of packaging materials is used to pack cookies. Since paper cartons, tins have lost out, flexible packaging materials as the packaging medium of cookies is widely popular these days.

Advantages of flexible packaging material

- 1) Functionality,
- 2) Lower cost,
- 3) Printability,
- 4) Light weight,
- 5) Savings in freight and other such factors

Commonly used packaging materials for cookies are



Cellophane

- Excellent gas barrier properties and
- Heat sealability.
- Gloss
- MST, MSAT, Coated Cellophane (MXXT)

BIAXIALLY ORIENTED POLYPROPYLENE FILM

- Biaxially Oriented Polypropylene film commonly known as OPP.
- Good barrier to odour and moisture.
- Maintains product freshness and quality.

THERMOFORMED PLASTIC TRAYS

- Thermoformed plastic trays of polystyrene or PVC with multiple cavities are used to pack assorted cookies.
- They are closed with a Snap-on lid or overwrapped or sealed with a lidding material.
- The products rest nicely in the compartments and make a good presentation.

TIN BOXES

- Good sealing property.
- More compressive strength.
- Green and healthy packaging.
- Increased shelf life.
- Easy to handle.

Quality checking of cookies before packaging

Quality control covers checks of raw materials, manufacturing process and finished products and packaging. Quality control involves all areas of the company activities: purchasing, warehousing, production, engineering, sales and laboratory testing. There are several standards applied in the cookies manufacturing industry and recognised internationally: HACCP, ISO 9000 series, BS 570.

Quality control functions in a biscuit bakery will cover the following elements:

- Specifications and quality of all raw materials including ingredients and packaging materials
- Production and packaging equipment
- Equipment maintenance

- Process control throughout the manufacturing process
- Production output, downtime and damaged product
- Biscuit dimensions, colour, weight, texture and flavour
- Pack weights, appearance, labelling and security
- Metal detection
- Factory conditions, hygiene, cleaning procedures and services
- Warehousing, storage and despatch of the biscuits
- People and their facilities

Important quality parameters of cookies before packaging

- ✓ Cookies weight
- ✓ Dimensions : Length, Width and diameter
- ✓ Colour top and bottom
- ✓ Moisture content

Innovative packaging ingredients used in cookies

Use of active packaging ingredients in cookies helps to significantly increase the shelf-life and maintain the original quality of the product. Commonly used active packaging ingredients are

- Oxygen absorbent and
- Antimicrobial agents.

Wrapping styles of cookies packaging

Cookies are packed using the following two wrapping styles.

- 1) End fold wrapping
- 2) Pillow pack wrapping

Cookies must be of common size and shape with a certain consistency and rather narrow tolerances in their dimensions. Standard wrapping machines can be used.

ENDFOLD WRAPPING

A portion of cookies standing on edge is roll wrapped or fold wrapped into a heat sealable film.

- ☐ The longitudinal packet seal is sealed tightly in a fin seal style.
- ☐ The packet ends are folded neatly and heat-sealed.
- ☐ Due to the neat and tight surrounding of the film, this packet gives utmost mechanical protection and acceptable barrier properties.

PILLOW PACK WRAPPING

In this type of wrapping configuration, cookies are packed in a primary wrapper and are over-wrapped by a carton to improve presentation and acceptance.

- Offers flexibility and accuracy
- Tightly wrapped than enfold wrap •

Labelling requirements of cookies

FSSAI regulations may be called the Food Safety and Standards (Packaging and labelling) Regulations, 2011 1.1.2: These regulations shall come into force on or after 5th August, 2011

A product label is the only way of communicating with each and every consumer. Certain information are mandatory on food label as per the regulatory requirement of the country. The food label should be accurate and should give factual information. Misinformation on labels can attract penalty from regulatory bodies. Correct label fixation is responsibility of every food business operator. Wrong label can be one of the reasons for recalling the product if it impose safety risk to consumer –undeclared like allergens.

Every pre-packaged food shall carry a label containing information as required here under unless otherwise provided, namely,

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

Conclusion

- Packaging became an important parameter in marketing of any food product.
- Good packaging reflects the sustainability of cookies.
- Hence selection of package is important to contain the cookies in a cost effective way that satisfies industry requirements.
- It must also satisfy the consumer desires by maintaining cookies safety and minimizes environmental impacts.

FOOD SAFETY AND STANDARDS (FOOD PRODUCTS STANDARDS AND FOOD ADDITIVES) REGULATIONS, 2011

FSSAI 2.4.15 BAKERY PRODUCTS:

1. **Biscuits** including wafer biscuits shall be made from maida, vanaspati or refined edible oil or table butter or desi butter or margarine or ghee or their mixture containing any one or more of the following ingredients, namely:—

Edible common salt, butter, milk powder, cereals and their products, cheese cocoa, coffee extract, edible desiccated coconut, dextrose, fruit and fruits products, dry fruit and nuts, egg, edible vegetable products, ginger, gluten groundnut flour, milk and milk products, honey, liquid glucose, malt products, edible oilseeds, flour and meals, spices and condiments, edible starches such as potato starch and edible flours, sugar and sugar products, invert sugar, jaggery, protein concentrates, oligofructose (max 15%) vinegar and other nutrients and vitamins:

Provided that it may contain food additives specified in these regulations including Appendix A:

Provided further that it may contain artificial sweetener as provided in regulation 3.1.3 of these regulations and label declaration as provided in regulation 2.4.5 (24, 25, 26, 28 & 29) of Food Safety and Standards (Packaging and Labeling) Regulations, 2011.

Provided also that it shall conform to following standards, namely:—

- (i) Ash insoluble in dilute hydrochloric acid (on dry basis): shall not be more than 0.1 percent

(ii) Acidity of extracted fat (a s oleic acid):- not exceeding 1.5 per cent.

45[Provided also that biscuit may contain baker’s yeast at the levels required under “Good Manufacturing Practices]

It may contain Oligofructose (dietary fibres) upto 15% maximum subject to label declaration under Regulation 2.4.5 (43) of Food Safety and Standards (Packaging and Labeling) Regulations, 2011.

FSSAI 7.2.1 Cakes, cookies and pies

The term “sweet cracker” or “sweet biscuit” used in this category refers to a cookie-like product that may beaten as a dessert such as butter cake, cheesecake, fruit-filled cereal bars, pound cake, moist cake (type of starchy dessert), western cakes, moon cakes, sponge cake, fruit filled pies (e.g. apple pie), custard types, oatmeal cookies, sugar cookies and British “biscuits” (cookies or sweet crackers).

Food Additives for Cookies

Bakery products					
Food Category System	Food Category Name	Food Additive	INS No	Recommended maximum level	Note
7.2.1	Cakes, cookies, biscuit, cracker and pies	Acesulfame potassium	950	1,000 mg/kg	165,188
		Allura red AC	129	100 mg/kg	
		Aspartame	951	1,700 mg/kg	191,165
		Aspartame acesulfame salt	962	1,000 mg/kg	77, 113
		BENZOATES			
		Beeswax	901	GMP	3
		Brilliant blue FCF	133	100 mg/kg	
		CAROTENOIDS		100 mg/kg	

		CHLOROPHYLLS AND CHLOROPHYLLINS, COPPER COMPLEXES		75 mg/kg	
		Candelilla wax		GMP	3
		Caramel III - ammonia caramel		50,000 mg/kg	
		Caramel IV – sulfite ammonia caramel		1,200 mg/kg	
		beta-Carotenes, vegetable		1,000 mg/kg	
		Diacetyltartaric and fatty acid esters of glycerol		20,000 mg/kg	
		HYDROXYBEN ZOATES, PARA-		300 mg/kg	27
		IRON OXIDES		100 mg/kg	-
		Indigotine (Indigo carmine)		100 mg/kg	
		Neotame		80 mg/kg	165
		PHOSPHATES		9,300 mg/kg	229,33
		52[omit]	
		RIBOFLAVINS		300 mg/kg	
		SACCHARINS		170 mg/kg	165
		SULFITES		50 mg/kg	44
		Shellac, bleached	904	GMP	3
		Sucralose (Trichlorogalactos ucrose)	955	700 mg/kg	165
		Sucroglycerides	474	10,000 mg/kg	
		52[Omit]	
		Sucrose esters of Fatty acids	473	GMP	
		Tartaric acid	334	GMP	
		Benzoyl peroxide	928	40 mg/kg	
		Curcumin	100 (i)	GMP	

		Canthaxanthin	161 g	GMP	
		Annatto	160 (b)	GMP	
		Carmoisine	122	100 mg/kg	
		Erythrosine	127	50 mg/kg	
		POLYSORBATES		3,000 mg/kg	
		Tartarazine	102	100 mg/kg	
		Potassium iodate	917	GMP	
		52[Poly glycerol esters of fatty acid	475	10,000 mg/kg	
		TOCOPHEROLS		200 mg/kg	389
		TARTRATES		5,000 mg/kg	45
		Propylene glycol Alginates	405	3,000 mg/kg	

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.

PACKAGING AND LABELLING

FSSAI 2.1: Packaging 2.1.1: General Requirements

1. A utensil or container made of the following materials or metals, when used in the preparation, packaging and storing of food shall be deemed to render it unfit for human consumption:— (a) containers which are rusty; (b) enameled containers which have become chipped and rusty; (c) copper or brass containers which are not properly tinned (d) containers made of aluminium not conforming in chemical composition to IS:20 specification for Cast Aluminium & Aluminium Alloy for utensils or IS:21 specification for Wrought Aluminium and Aluminium Alloy for utensils.

2. Containers made of plastic materials should conform to the following Indian Standards Specification, used as appliances or receptacles for packing or storing whether partly or wholly, food articles namely :—

- (i) IS : 10146 (Specification for Polyethylene in contact with foodstuffs);
- (ii) IS : 10142 (Specification for Styrene Polymers in contact with foodstuffs);
- (iii) IS : 10151 (Specification for Polyvinyl Chloride (PVC), in contact with foodstuffs);
- (iv) IS : 10910 (Specification for Polypropylene in contact with foodstuffs);
- (v) IS : 11434 (Specification for Ionomer Resins in contact with foodstuffs);
- (vi) IS: 11704 Specification for Ethylene Acrylic Acid (EAA) copolymer.
- (vii) IS: 12252 - Specification for Poly alkylene terephthalates (PET).
- (viii) IS: 12247 - Specification for Nylon 6 Polymer;
- (ix) IS: 13601 - Ethylene Vinyl Acetate (EVA);
- (x) IS: 13576 - Ethylene Metha Acrylic Acid (EMAA);
- (xi) Tin and plastic containers once used, shall not be re-used for packaging of edible oils and fats; Provided that utensils or

containers made of copper though not properly tinned, may be used for the preparation of sugar confectionery or essential oils and mere use of such utensils or containers shall not be deemed to render sugar confectionery or essential oils unfit for human consumption.

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:

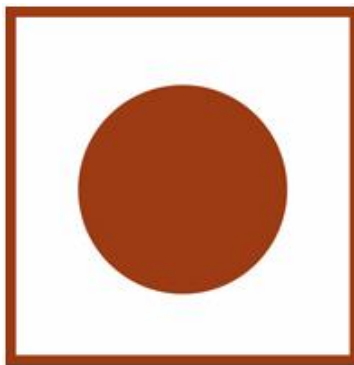
It is important to note that any “health claim” or “nutrition claim” or “risk reduction” claim made in the label will be thoroughly scrutinized by the FSSAI authorities. Hence, any such claim must be validated by test data. As per the rules, the following is the definition for “health claim”, “nutrition 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;

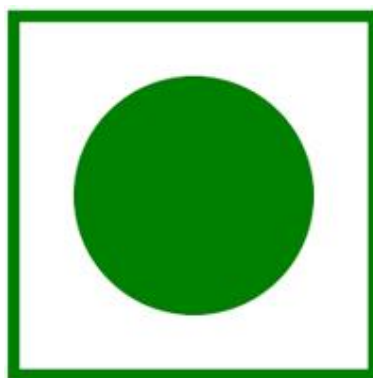
Veg or Non-Veg Symbol

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 sterilised 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.