Ministry of Food Processing Industries
Government of India

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Reading Manual for Cakes

Under PMFME Scheme

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ABBREVIATIONS & ACRONYMS

Sr: No.	Abbreviations &Acronyms	Full Forms
1.	CAGR	Compound annual growth rate
2.	FAO	Food and Agriculture Organization
3.	FBO	Food Business Operator
4.	FLRS	Food Licensing and Registration System
5.	FPOs	Farmer Producer Organizations
6.	FSSAI	Food Safety and Standards Authority of India
7.	GMP	Good manufacturing practice
8.	kcal	kilocalorie
9.	MoFPI	Ministry of Food Processing Industries
10.	PA	Polyamide
11.	PET	Polyesters
12.	PFA	Prevention of Food Adulteration
13.	RF	Refined Wheat Meal
14.	SHGs	Self Help Groups
15.	UAE	United Arab Emirates
16.	UK	United Kingdom
17.	US	United States
18.	WGWF	whole-grain wheat flour
19.	WVTR	water vapor transmission rate

CHAPTER 1
INTRODUCTION

1.1. Industrial Overview:

Bakery

Bakery goods are an integral component of a modern lifestyle. Bakery products are not limited to, bread, rolls, cookies, pies, pastries and muffins, that are typically prepared from flour or meals derived from some kind of grain and cooked over dry heat, especially in a certain type of oven. Categories of bakery and baked goods such as bars, breads (bagels, buns, rolls, biscuits and loaf breads), cookies, sweets (cakes, cheesecakes and pies), muffins, pizza, snack cakes, tortillas and tortillas (doughnuts, Danish, sweet rolls, cinnamon rolls and coffee cake).

Energy is provided by the food we consume, and our body needs to work. Just like we need to put gasoline in our car or recharge the battery of our cell phone, our body needs to be fed every day with food that provides energy. A balanced diet will give our body the right amount of energy we need to remain healthy, and enough raw materials. Items from bakeries are commonly viewed as detrimental to health. Health-based bakery products are the products which, when consumed in sufficient quantities, result in special health benefits other than the usual nutritional supply.

Bakery owners are also selling bakery items with healthy choices. Bakers are now also taking additional precautions to make it more nutritious and delicious using healthier ingredients. In order to preserve good health while enjoying the taste and comfort provided by bakery items, customers need to become aware of the healthier choices.

1.1.1. Types of Bakery Products

- Bread- Breads are one of the oldest forms of food in the world and are made by baking dough, a flour and water mixture.

- Cakes- Cakes can be either too simple or quite fancily made, such as the wedding cakes served on beautifully oriented events such as birthdays, Christmas, wedding showers, baby showers, and bridal showers, and a lot more!
- Bun- Bagels, popular breakfast items, are usually made of yeast wheat dough and come in the form of a ring.
- Pastries- Pastries refer to baked goods made with ingredients that often include butter, sugar, shortening, flour, baking powder and eggs.
- Biscuits/Cookies- Whether you call them “cookies,” “biscuits,” or even “koekee,” cookies are loved the world over. They can be dropped, sliced, molded, rolled and cut, baked into bars, sandwiched with fillings, and decorated with colourful icings.
- Doughnuts- Usually sweet and deep fried; doughnuts come with a hole in the middle or as a solid piece filled with items such as jelly, creams or custards.

1.2. Product Description:

Cake is a type of sweet food that is typically baked, made from flour, sugar, and other ingredients. Cakes were modifications of bread in their earliest types, but now cakes cover a wide variety of preparations that can be basic or complex, and that share characteristics with other sweets such as pastries, meringues, custards, and pies. Flour, sugar, eggs, butter or oil or margarine, a liquid, and leavening agents such as baking soda or baking powder are the most widely used cake ingredients. Dry, candied, or fresh fruit, nuts, cocoa, and extracts such as vanilla, with various substitutions for the main ingredients, are common additional ingredients and flavourings. Fruit preserves, nuts or dessert sauces (such as pastry cream), iced butter cream or other icing, and decorated with marzipan, piped border or candied fruit may also be filled with cakes. On ceremonial occasions, such as marriages, anniversaries, and birthdays, cake is sometimes served as a celebratory dessert. Countless cake recipes are available; some are bread-like, some are rich and intricate, and many are centuries old. Cake making is no longer

a complex process; while considerable labor went into cake making at one time (especially the whisking of egg foams), baking equipment and instructions have been streamlined so that a cake can be baked even by the most amateur of cooks. Two main types of cakes are available: butter cakes (also referred to as shortened cakes) and sponge cakes. The difference is in the fat content of these two broad types of cake. Of of these big forms has countless variations.

1. Sponge Cakes-Sponge cakes have little to no fat and typically have a higher percentage of eggs. This gives them an airy, lighter texture (think angel food and sponge cake). When you bake sponge cakes, it is important to note that as soon as it is ready, the batter needs to go into the oven to prevent the egg whites from deflating. Owing to the raise the egg whites give them, they also need to be baked in a tall pan. These cakes are not going to hold up well against heavy frosting, so it's best to give them a dollop of whipped cream or a soft glaze.

2. Butter Cakes- On the other hand, butter cakes contain butter, margarine, or shortening of vegetables, giving you the dense, moist cakes that we know and love. If it says "cream butter and sugar," in the recipe, it's a butter cake. You'll usually add egg, flour, and baking powder or baking soda for leavening once the creaming is complete. To name a couple, butter cakes will come in chocolate, white, yellow and marble. Other cakes in this type, such as carrot cake or red velvet cake, can be "shortened" with oil.

1.3. Market Potential:

The global market bread product is divided by product type (Loaves, Baguettes, Rolls, Burger Buns, Sandwich Slices, Ciabatta, Frozen Bread, and Others), Distribution Channel (Convenience Stores, Specialist Retailers, Supermarkets and Hypermarkets, Online Retail, Variety Stores, and Others), and by Geography. Global bread market is projected to register a CAGR of 1.43% during the forecast period, 2019 - 2024. During the forecast period, 2019 - 2024, the global bread market is expected to register a CAGR of 1.43%. Since the nineties, the Indian bread industry has come a long way. For certain clients, bread has progressed from being viewed as a fundamental breakfast food item to being a confectionary item. Rising

disposable sales, urbanization, and changing customer tastes and behaviors have provided the bread industry a boost over the years. The Indian bread market stood at $640.73 million in 2017, and is projected to rise to $1024.54 million by 2024 at a CAGR of over 10.70 percent, in value terms, during 2019-2024. Market factors and demographic patterns are increasingly affecting supply and demand; India's bread market is aided by an expanding working population and a rising number of health-conscious consumers. In addition, some of the other factors expected to propel demand for bread over the next five years are rising disposable income along with shifting lifestyle and knowledge of eating a good and safe diet to minimize health problems. The bread industry in India is dominated by unorganized players, leading to about 55% of the total market.[i]

1.4. Raw Material Description:

The raw materials required for Cake is as follow:

- Baking Powder
- Castor Sugar
- Eggs
- All Purpose Flour (Maida)
- Vanilla Essence
- Corn Starch
- Oil
- RO Water

Whipping Cream:

- Whipping Cream
- Icing Sugar

Decoration, Icing & Soaking: (Optional)

- Pineapple Juice
- Chopped Canned Pineapples
- Canned Cherry

Usually, a traditional cake recipe contains flour, a kind of sweetener, eggs, some sort of fat, a liquid, a leavening agent to make it rise and flavour (like vanilla, cocoa powder or cinnamon).

In order to create cakes of varying density, texture and taste, the ingredients communicate with each other. Here is how each ingredient functions:

- The key instigators of cakes being their own category (separate from breads) were **leavening agents,** as these allowed baked products to grow literally in ways they never had before. During the baking process, chemical leavening agents release carbon dioxide gases within the cake mixture, assisting the batter to rise into a porous structure.
- To enhance texture, moisture and overall flavour, a **fat source** is commonly used. Because of its ability to trap air when creamed, butter is the perennial favourite, helping to make baked goods lighter and more aromatic.
- For cakes, **sweeteners** are very important. While alternatives are available, such as honey or artificial sweeteners, plain old sugar binds best with molecules of water, helping to make cakes moist and smooth.
- **Eggs** play a major role, as their intrinsic proteins function to shape the cake's structure with other ingredients. The emulsifiers in the yolks often help to combine ingredients such as water and oil that usually don't want to remain together. When heated during baking, the same proteins enable the cake to achieve a sweet, golden-brown hue.
- **Flour**, thanks to its proteins which mix with water to form gluten, gives the cake its strength and keeps all the ingredients together. As the cake grows in the oven, the gluten expands to absorb the leavening gases. The greater the content of protein in the flour, the better the dough is.
- The protein, starch and leavening agents are **hydrated by liquids**, enabling the chemical changes necessary to create the cake's structure. During the baking process, liquid vaporizes, producing steam that expands the air cells and the cake's height. Liquids also contribute to keeping the cake moist and enhancing its overall texture.

1.5. Types of Raw Material:

- **Chiffon Cakes-** Chiffon cakes are sponge cakes with moisture-enhancing vegetable oil.
- **Chocolate Cakes-** Chocolate cakes are melted chocolate or cocoa powder flavoured butter cakes, sponge cakes, or other cakes. German chocolate cake is a type of cake made from chocolate. Chocolate cakes that contain fudge are fudge cakes.
- **Coffee Cake-** Coffee cake is normally a cake for breakfast or a coffee break, eaten with coffee or tea. Yeast is used as a leavening agent in some forms, while others use baking

soda or baking powder. A crumb topping called streusel or a soft glaze drizzle is also present in these cakes.

- **Baked Flourless-** Cakes Baked flourless cakes include flourless chocolate cakes and baked cheesecakes. Cheesecakes are not a cake at all, despite their name. Cheesecakes are custard pies, often made from some kind of cheese (often cream cheese, mascarpone, ricotta, or the like), with a filling and very little flour added, although it is possible to use a flour-based or graham cracker crust. There are also very old cheesecakes, with evidence of sweetened honey cakes dating back to ancient Greece.
- **Butter or Oil Layer Cakes-** Most of the popular cakes used as wedding cakes, etc., contain butter or oil layer cakes, and those sold as frozen cakes. To provide both lift and a moist feel, baking powder or soda bicarbonate is used. It is possible to incorporate many flavourings and ingredients; examples include the devil's food cake, carrot cake, and banana bread.
- **Yeast Cakes-** Yeast cakes are very similar to yeast bread and are the oldest. These cakes are also very traditional in style and include baked and stolen pastries such as babka.

CHAPTER 2
PROCESS & MACHINERY REQUIREMENT

2.1. Raw Material Aspects:

Maida is Indian subcontinent white flour made of wheat. Fine milled, processed, and bleached without any bran, it closely resembles cake flour. Maida is commonly used for the processing of fast food, baked goods such as pastries, bread, and various forms of sweet foods. It is often labelled and sold as "All-purpose Flour," although distinct from all-purpose Meal, due to this vast range of uses.

The endosperm is Maida and it is formed by the starchy white portion of the grain. The bran is isolated and refined with the germ by passing through 80 meshes per inch (31 mesh per centimetre). Though yellowish by default because of wheat pigments, Midget is normally blanketed by either of the floral bleaching agents, either naturally due to atmospheric oxygen. While it is milled from winter wheat that has high gluten content, the heat generated during the milling process results in denaturing of the protein, limiting its use in the preparation of leavened cake base.

Castor Sugar

Powdered sugar is a finely ground sugar made by milling the granulated sugar to a powdered state. It is often referred to as 10X sugar or icing sugar. It normally contains 2% to 5% of an anti-caking agent, such as maize starch, potato starch, or tricalcium phosphate. Moisture absorption, clumping prevention, and flow enhancement.

Except the castor sugar and all-purpose flour the other raw material used for cake is given below:

- Baking Powder
- Castor Sugar
- Eggs
- All Purpose Flour (Maida)
- Vanilla Essence
- Corn Starch
- Oil
- RO Water

Whipping Cream:

- Whipping Cream
- Icing Sugar

Decoration, Icing & Soaking: (Optional)

- Pineapple Juice
- Chopped Canned Pineapples
- Canned Cherry

2.2. Source of Raw Material

Uttar Pradesh is the largest producer of wheat in an area with 9.75 million hectares (32%), followed by Madhya Pradesh (18.75%), Punjab (11.48%), Rajasthan (9.74%), Haryana (8.36%), and Bihar (6.82%). As wheat is a major grown crop the availability of wheat grain is easy in the northern states of India. Various mandis are available in every district for wheat. Raw material can be procured from these local vendors, or direct from the farm milled to form the Maida. Sugar and other raw materials also available in the local vendors, shops, and other traders.

2.3. Technologies:

Creaming Method

With this method, the butter and sugar are beaten together using plenty of elbow grease until the mix turns pale and creamy. At this time, gradually the eggs and dry ingredients can be added. The tricky thing is to prevent curdling after the eggs have been added to the mixture which can separate the mixture into a hard or secure baking process. A good example of one of the most delicious cakes using a creaming process is Victoria Sponge Cake.

Melting Method

Another very easy way is to create moist and densest cakes such as a rich chocolate cake or fruit cake since the mix is not aerated by beating or whisking. Instead, butter is normally melted before eggs, then dry ingredients are added, and the cake is increased with a chemical raising agent, like baking powder. Again, don't be over-enthusiastic about it - overwork can lead to dry and tough baking.

Whisking Method

The whisking method uses whisking at the place of raising agent to work air into the mix and is ideal for a low fat lighter sponge because of contains no butter. Eggs and sugar are whisked together and then Folded through the egg mixture gently in batches until the dry ingredients are tamed and the air is not removed - otherwise, it loses the lightweight, airy texture you like. A perfect example of the whisking process is this chocolate recette.

2.4. Manufacturing Process: (cake)

Ingredients scaling

All types of raw material are Procured from the raw material store and transported by suitable material handling equipment to their respective holding tanks.

Mixing (hot/cold process)

In the drum of the batter mixing machine, all raw materials are added in the amount needed according to the required sequence. There are different speeds for mixing various components and they are maintained to achieve the most effective batter features. This produces the cake batter.

Depositing

The baking tray is appropriately greased with oil and a butter paper of appropriate shape i.e. shape of the bottom is placed at bottom of the tray. Then the cake batter is poured into a baking tray, followed by which batter is appropriately levelled.

Baking

Bake at 360–425°F (182–218°C) to an internal temperature of 204°F (95°C). The hot processed batter should have a shorter baking time. The cold processed batter should be baked longer. The baked cake is obtained from the oven; it’s allowed to cool in the pan itself prior to de-panning.

De-panning

De-pan from the oven onto dusted paper pan liners while the cakes are still warm. The butter paper is then gently removed from cake, followed by which outer skin of cake is also removed with a knife, and then the cake is divided into multiple layers depending on the thickness of the cake.

Cooling

Cool product to loaf internal temperature of 95–105°F (35–40°C) before icing and packaging.

Icing

Simultaneously Whipping Cream and Icing Sugar are beaten by a simple beater until sufficiently stiff, which is then fed to holding tank of cake decorating machine. The layer of cake is placed on a cake decorating and icing machine, followed by the cake-decorating machine which uses the layer of whipped cream over the cake, then the layer of chopped fruit slices is placed and another layer of cake is placed over the pineapple layer. This is followed by a layer of chopped fruit slices.

Storage and Packaging or serving

When all layers are added, the last layer is filled with only one layer of whipping cream and then easily decorated by the machine, then finished manually. The cake is in the refrigerator until it is sold at the correct temperature.

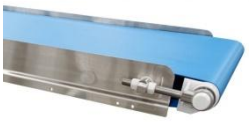
2.5. Flow Chart:

Steps	Machine	Uses	Picture
Ingredients scaling	Weighing scale	Weighting Scales are used to measure the weight of an item	
Mixing	Batter mixer machine	A machine that uses a gear-driven mechanism to rotate a set of "beaters" in a bowl.	

Depositing	Cake Depositor Machine	It's used to fill batters within baking pans or mold for the baking process.	
Baking	Baking oven	An oven is a thermally insulated chamber used for the heating, baking, or drying of a substance.	
De-panning	**De- panning**	De-panning is generally done manually by using different tools.	
Icing	**Cake Icing & Decorating Machine**	As the name suggests, this machine is used to decorate the cake with appropriate cream or icing.	
Storage	**Display Refrigerator**	It's a refrigerator designed to store the given product in temperature controlled space with at least one transparent wall, so as to display stored content.	

2.6. Additional Machine & Equipment:

Machine and Equipment	**Uses**	**Pictures**
Material handling Equipments	These set of tools are specifically used for decorating cakes and other bakery items with appropriate design with cream, chocolate etc.	

Food Grade Conveyor	Generally used to move objects from one location to another.	

2.7. General Failures & Remedies:

S. No.	General Failures	Remedies
1.	Ball bearing failure of various machine	1. Proper periodic lubrication of all bearings in various machines. 2. Regular replacement of all bearing to prevent critical failures.
2.	Power Drive Overload	1. Ensure proper weighing & metering specially in case of semi-automatic plant. 2. Install warning sensor in buffer region of loading capacity to ensure efficient operation.
3.	Mechanical Key Failure	1. Ensure that mechanical keys are replaced as per there pre-defined operational life. 2. Prevent Overloading.
4.	Loss of Interface	1. This problem is dominant in newly established automatic plant, one must learn to maintain rules in plant & ensure no employee goes near transmission lines, unless authorised. 2. Provide proper physical shielding for the connections.

2.8. Nutritional Information:

Adequate nutrition must always be followed as it is important to ensure optimum health. We have to ensure that the nutrients that we get from the food we consume enable us to keep a stable bodily condition and live a long life.

One myth of diet people is that anything nutritious should not be tasty, and delicious food should not be nutritious. This is the conviction that cakes are an indulgent, decadent candy with little to no health benefits.

A nutritional myth is that nothing should be delightful for nutrition and tasty food should not be nutritious on the other side. The idea is that cakes are a tasty and decadent dessert with little to no value to your wellbeing.

Cakes can be made from flour and fruits as filling; margarine or butter that is rich and fluffy in taste; sugar that enhances sweetness and attractiveness to children; mixing liquid; eggs as a binding agent; leavening to increase the dough, and frosting to enhance the aesthetically appealing effect.

100 gram of piece of cake can provide the following nutrient:

S. no.	**Nutrition**	**Qty**
1.	Calories	393 kcal
2.	Saturated Fat	3g
3.	Polyunsaturated Fat	6.4g
4.	Monounsaturated Fat	7.6g
5.	Cholesterol	75mg
6.	Sodium	270mg
7.	Potassium	54mg
8.	Total Carbohydrates	57g
9.	Dietary Fiber	0.3g
10.	Sugars	42g
11.	Vitamin A	2.1%
12.	Vitamin C	0%
13.	Calcium	4.8%
14.	Iron	6%

2.9. Export Potential & Sales Aspect:

The Cake demands in India will increase by 12.5% in the forecast period 2020-2025 with a CAGR. Items from bakeries have long been basic nutrition food items. Comfortable, open, and nutritious profiles are the key factors in their livelihoods on the modern market. Since cakes became increasingly popular items, which are baked or made to the convenience of the

customer, are becoming increasingly noticeable on the market owing to consumer perceptions and convenience and health qualities. As a result of urban development and increased labor force, there has been an increased preference for out-of-home consumption and demand for immediate and nutritious goods, which is expected to stimulate market growth in the forecast period. The cake is being traded worldwide. There are almost 103 countries and territories that actively import Cake from India, the data given on the exportation analysis revealed. Total exports have a combined value of US$ 330.31 million. From Cake export analysis to exports of capital, the following data is complete.

The table lists India's top five trade partners who import Cake from Indian exporters, from the perspective of Cake's export details, while a total of US$ 273.87 million of the top five countries exports the total value of Cake's exports, representing 82.91% of its export value.

Country	**Value (USD Million)**
USA	170.54
Bangladesh	45.87
Canada	22.18
United Kingdom	21.47
Rep. of Korea	13.81[ii]

CHAPTER 3
PACKAGING

3.1. Shelf Life of Product:

Many new baked goods have a shelf life of just a few days at room temperature. The most popular type of spoilage organism to be related to baked goods is molds. It can last up to 2-3 days when stored in the fridge, or else it lasts for a day or two.

The quality of the product is also established, apart from the basics such as food grade packaging material, the type of process and technology further improves the quality of the product, such as the addition of anti-microbial packaging to the value of the product and thus the quality.

- **Proper Storage**

When food products are stored for a long period of time and not stored properly, other food products that are unhealthy are spoiled. As germs start growing on it, food items that have been stored for a long time get spoiled. Until the food is rotten, it cannot be consumed, and needs to be thrown away. Spoilage is a stage in which food items deteriorate to the extent where there is no edible human food. "In most cases it has been seen that these Maida-based instants take a toll on the digestive process. Its remnants may reach the appendix area of the body and trigger infection."

- **The bad fats:**

Sadly, most processed foods are packed with not-so-good fats, including saturated fatty acids or trans fats. Both monounsaturated fatty acids and polyunsaturated fatty acids are fats that are healthy for you. Edible vegetable oil, sugar, sugar syrup, taste enhancer, and many other agents like these are not ideal for your well-being if you dig deep into food labels and what those words really mean. Instant food has saturated fats that, if consumed heavily or on a regular basis, will raise the amount of cholesterol in the blood. Having high cholesterol increases both type 2 diabetes and heart disease risk.

It is possible to germ-infect food and water. There are germs borne by flies. When they are sitting on our food, they transfer these germs on to our food. There are various factors

responsible for food spoilage, such as bacteria, mold, yeast, moisture, light, temperature, and chemical reactions.

3.2. Cake Packaging:

The packaging material to be used must be carefully chosen, taking into account both practical and marketing specifications, in order to ensure the consistency of the food shape and size during handling, transport, storage, and delivery. In general, the packaging specifications for Bread are listed below:

- To protect the product from spillage and spoilage.
- To provide protection against atmospheric factors such as light, heat, humidity, and oxygen.
- The selected packaging materials should have high water vapour and oxygen barriers.
- The packaging material should have a high barrier property to prevent aroma/flavour losses and in gross of external odour.
- Therefore, the wrapping material should be resistant to grease and oil and be compliant with the commodity.
- The packaging content should, in addition to the above practical specifications, have good machinability, printability and be readily available and disposable.

3.3. Type of Packaging:

The packaging materials that are widely used in cakes are paper. Paper includes oil-resistant paper, wax paper, etc.; nitrocellulose film, polyethylene, polypropylene, and the like are used in plastics.

- Cardboard Cartons: When in transit from the bakery to the customer, cake boxes provide protection for cakes and other bakery products. Usually used in bakeries, solid board and folding carton cake boxes are available in one- and two-piece designs. An interesting, inventive cake box consisting of a tray and lid is named 'Torten Boy.' This box can be opened on two sides to allow horizontal rather than upward removal of the cake. This removes the challenge of extracting the cake from the box and guarantees that there is no risk. In bakeries, solid board and folding carton cake boxes are usually used and available in designs of one and two pieces. 'Torten Boy' is an unusual, inventive cake box consisting of a tray and a lid. This box can be opened on two sides to cut the cake horizontally rather than upwards. This prevents any issues with removing the cake from the box and guarantees that there is no damage.

- Plastic Boxes: These boxes are made of hard plastic in round shape boxes created for cakes and cookies.
- Cardboard cake box fully enclosed - This is possibly the most common form of cake box. These boxes, often with a glossy outer finish and a matt interior finish, can be made of brown cardboard or white milk board. Some may have separate lids, while others are connected to the rest of the box with a flip lid. They come in a range of sizes to accommodate almost every cake size and shape, and can also be used for pies and cookie cakes.
- A window patisserie box is a box with a transparent 'window' of plastic on top of the lid so you can easily see what is inside the box. These boxes are great for cakes that you would like to feature a special message or decoration on top. They provide individuals with a mouth-watering taste of the tasty treat they are about to consume. They deliver great visibility, visual effect and presentation. And it can also be used for cookies, cupcakes, muffins, tarts, brownies and other pastries since they come in all shapes and sizes.
- Cupcake window box - The cupcake window box has a 'window' on its lid, much like the window patisserie box, from which you can see the box's contents. However, this package has an insert that is specifically designed for cupcakes. The inserts make sure that while loading or unloading the cupcakes from the package, the delicate cupcake icing is not harmed and also holds the cupcakes in place throughout transport. These boxes are mainly intended for cupcakes, but they can also be used for muffins.

Essentials

- ✓ Shelf-life duration, i.e. the degree of protection required by the commodity against pick-up of moisture, preservation of aroma retention, decolouration, etc (in case taste maker is added)
- ✓ During packaging, transportation, and delivery, environmental conditions
- ✓ Business type/sector
- ✓ Preferences for users
- ✓ Printability and appeal of aesthetics

The package types generally used as consumer packs are:

- ✓ Plastic packages of various sizes and shapes with labels and provided with metal or plastic caps. The plastic lids have added inbuilt features of tamper evidence, dispensing, grinding, etc.
- ✓ Printed tinplate container with/without dispensing systems
- ✓ Printed tinplate container with/without dispensing systems
- ✓ Plastic containers with plugs and caps with dispensing and tamper evidence features
- ✓ Printed flexible pouches – pillow pouch, gusseted pouch, stand-up pouch.
- ✓ Lined cartons

3.4. Material of Packaging:

The most common choice of packaging medium is paper/carton boxes as it provides the required protection and preservation, grease resistance, physical strength, machinability, and printability. In terms of preserving consistency during the storage era, the suitability and adoptability of these packaging materials have been examined. Plastic-based packaging materials that can be used for cake are listed below.

- **Polyethylene (PE)-** It is considered to be the backbone of packaging films. Since one of the greatest threats to the quality of product comes from moisture, polyethylene with its low water vapor transmission is of definite interest. Polyethylene films are fairly free of plasticizers and other additives and are quite extensively used as a part of lamination. Its ability to heat seal increases its value. Low-Density Polyethylene (LDPE) is an economical material with low WVTR, however, it has high permeability's to flavors/volatiles, poor grease resistance, and are limp. High-density polyethylene (HDPE) is stiffer, more translucent, and has better barrier properties but needs a higher temperature for sealing.

  Later additions include high molecular weight high-density polyethylene (HM HDPE) and linear low-density polyethylene (LLDPE). HM HDPE is a paper-like film with high physical strength and barrier properties but is less transparent than ordinary polyethylene. HM HDPE is available in twist-wrap grades. Polyethylene films are also suitable for making bags. A copolymer of polyethylene and polyvinyl alcohol and EVOH has outstanding gas barrier properties especially when dry.

- **Polypropylene-** Polypropylene films have better clarity than polyethylene and enjoy superior machinability due to stiffness. Lack of good salability has been a problem; however, PVDC and vinyl coating have been used to overcome this problem. Some varieties of PP have been specially developed for twist-wrap applications as they have the ability to lock in position after twisting.
- **Polyesters (PET) and Polyamide (PA)-** Polyethylene terephthalate film has high tensile strength, gloss, and stiffness as well as puncture resistance. It has moderate WVTR but is a good barrier to volatiles and gases. To provide heat seal property, PET is normally laminated to other substrates. Nylons or polyamides are similar to PET but have high WVTR.

- **Paper Material-** The paper's properties include the paper's thickness, weight, texture, folding resistance, strength and scale. Some paper grades readily tear, although others avoid tearing. Another significant property of paper is the moisture retention ability. Certain paper grades dry very easily and do not absorb moisture.

- **Metallised Films-** When polymeric films are metalized there is an improvement in their barrier properties. Metallization is also used for decorative purposes and aesthetics. The films, which are used for metallization, are PVC, PET, PP, and polyamides.

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CHAPTER-4

FOOD SAFETY REGULATIONS AND STANDARDS OF CAKES

4.1. Introduction to FSSAI:

The Food Safety and Standards Authority of India (FSSAI) has been established under Food Safety and Standards, 2006 which consolidates various acts & orders that have hitherto handled food-related issues in various Departments. The FSSAI is responsible for setting standards for food so that there is one body to deal with and no confusion in the minds of consumers, traders, manufacturers, and investors. The Act aims to establish a single reference point for all matters relating to food safety and standards, by moving from multi-level, multi-departmental control to a single line of command.

Highlights of the Food Safety and Standard Act, 2006-

Various central Acts like Prevention of Food Adulteration Act, 1954 , Fruit Products Order , 1955, Meat Food Products Order , 1973, Vegetable Oil Products (Control) Order, 1947,Edible Oils Packaging (Regulation)Order 1988, Solvent Extracted Oil, De- Oiled Meal and Edible Flour (Control) Order, 1967, Milk and Milk Products Order, 1992 etc will be repealed after commencement of FSS Act, 2006.

The Act also aims to establish a single reference point for all matters relating to food safety and standards, by moving from multi- level, multi- departmental control to a single line of command. To this effect, the Act establishes an independent statutory Authority – the Food Safety and Standards Authority of India with head office at Delhi. Food Safety and Standards Authority of India (FSSAI) and the State Food Safety Authorities shall enforce various provisions of the Act.

Establishment of the Authority-

Ministry of Health & Family Welfare, Government of India is the Administrative Ministry for the implementation of FSSAI. The Chairperson and Chief Executive Officer of Food Safety and Standards Authority of India (FSSAI) have already been appointed by Government of India. The Chairperson is in the rank of Secretary to Government of India.

4.2. FSSAI Registration & Licensing Process:

According to Section 31(1) of Food Safety and Standards (FSS) Act, 2006, Every Food Business Operator (FBO) in the country is required to be licensed under the Food Safety & Standards Authority of India (FSSAI).

As per FSS (Licensing & Registration) Regulations, 2011, Licenses and Registrations are granted to FBOs in a 3 tier system

- Registration - for petty FBOs with annual turnover less than Rs 12 lakhs
- State license - for medium-scale food manufacturers, processor and transporters
- Central License - for large-scale food manufacturers, processor and transporters

FSSAI registration is done online on the FSSAI website through Food Safety Compliance System (FoSCoS)

- FoSCoS has replaced the Food Licensing and Registration System (FLRS).
- Petty food business operators are required to obtain FSSAI Registration Certificate
- "Petty Food Manufacturer" means any food manufacturer, whomanufactures or sells any article of food himself or a petty retailer, hawker, itinerant vendor or temporary stall holder (or) distributes foods including in any religious or social gathering except a caterer;

or

- Other food businesses including small scale or cottage or such other industries relating to food business or tiny food businesses with an annual turnover not exceeding Rs. 12lakhs and/or whose production capacity of food (other than milk and milk products and meat and meat products) does not exceed 100 kg/ltr per day

Any person or entity that does not classify as a petty food business operator is required to obtain an FSSAI license for operating a food business in India.

FSSAI License - two types - State FSSAI License and central FSSAI License

Based on the size and nature of the business, the licensing authority would change.

- Large food manufacturer/processors/transporters and importers of food products require central FSSAI license
- Medium-sized food manufacturers, processor and transporters requires state FSSAI license.

- License period: 1 to 5 years as requested by the FBO.
- A higher fee for obtaining FSSAI license for more years.
- If a FBO has obtained the license for one or two years, renewal may be done, no later than 30 days prior to the expiry date of the license.

4.3. Food Safety & FSSAI Standards & Regulations:

Food Standards

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).

"2.4.15 for the bakery products" Provided that it may contain food additives specified in these regulations. 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 Labelling) 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 per cent.

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

Food Safety

Part I - General Hygienic and Sanitary practices to be followed by Petty Food Business Operators applying for Registration.

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 equipment’s 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.

4.4. Labelling Standards (Regulation 2.5 of FSS)

Labelling requirements for packaged food products as laid down in the Part 2.4 of the Prevention of Food Adulteration (PFA) Rules, 1955, and the Standards of Weights and Measures (Packaged Commodities) Rules of 1977, require that the labels contain the following information:

1. Name, trade name or description
2. Name of ingredients used in the product in descending order of their composition by weight or volume
3. Name and complete address of manufacturer/packer, importer, country of origin of the imported food (if the food article is manufactured outside India, but packed in India)
4. Nutritional Information
5. Information Relating to Food Additives, Colors and Flavors

6. Instructions for Use
7. Veg or Non-Veg Symbol
8. Net weight, number or volume of contents
9. Distinctive batch, lot or code number
10. Month and year of manufacture and packaging
11. Month and year by which the product is best consumed
12. Maximum retail price

Provided that — (i) the nutritional information may not be necessary, in case of foods such as raw agricultural commodities, like, wheat, rice, cereals, flour, spice mixes, herbs, condiments, table salt, sugar, jaggery, or non –nutritive products, like, soluble tea, coffee, soluble coffee, coffee-chicory mixture, packaged drinking water, packaged mineral water, alcoholic beverages or flour and vegetables, processed and pre-packaged assorted vegetables, flours, vegetables and products that comprise of single ingredient, pickles, papad, or foods served for immediate consumption such as served in hospitals, hotels or by food services vendors or halwais, or food shipped in bulk which is not for sale in that form to consumers.

Wherever applicable, the product label also must contains the following

The purpose of irradiation and license number in case of irradiated food. Extraneous addition of colouring material.

Non-vegetarian food – any food which contains whole or part of any animal including birds, fresh water or marine animals, eggs or product of any animal origin as an ingredient, not including milk or milk products – must have a symbol of a brown color-filled circle inside a brown square outline prominently displayed on the package, contrasting against the background on the display label in close proximity to the name or brand name of the food.

Vegetarian food must have a similar symbol of green color-filled circle inside a square with a green outline prominently displayed.

All declarations may be: Printed in English or Hindi on a label securely affixed to the package, or Made on an additional wrapper containing the imported package, or Printed on the package itself, or May be made on a card or tape affixed firmly to the package and bearing the required information prior to customs clearance.

Exporters should review the Chapter 2 of the “FSS (Packaging and Labelling) Regulation 2011” and the Compendium of Food Safety and Standards (Packaging and Labelling)

Regulation before designing labels for products to be exported to India. FSSAI revised the labelling Regulation and a draft notification to that effect was published on April 11, 2018, inviting comments from WTO member countries and the comments received are under review and the publication date remains unknown.

According to the FSS Packaging and Labelling Regulation 2011, “pre-packaged” or “pre packed food” including multi-piece packages, should carry mandatory information on the label.[iii]

CHAPTER - 5

OPPORTUNITIES FOR MICRO/UNORGANIZED ENTERPRISES

5.1. PM-FME Scheme:

Ministry of Food Processing Industries (MoFPI), in partnership with the States, has launched an all India centrally sponsored "PM Formalisation of Micro Food Processing Enterprises Scheme (PM FME Scheme)" for providing financial, technical and business support for up-gradation of existing micro food processing enterprises. The objectives of the scheme are:

I. Support for capital investment for up-gradation and formalization with registration for GST, FSSAI hygiene standards and Udyog Aadhar;
II. Capacity building through skill training, imparting technical knowledge on food safety, standards & hygiene and quality improvement;
III. Hand holding support for preparation of DPR, availing bank loan and up-gradation;
IV. Support to Farmer Producer Organizations (FPOs), Self Help Groups (SHGs), producers cooperatives for capital investment, common infrastructure and support branding and marketing.[iv]

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[iii] https://www.fssai.gov.in/cms/food-safety-and-standards-regulations.php

[iv] https://mofpi.nic.in/pmfme/