Ministry of Food Processing Industries
Government of India

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Reading Manual for Cookies

Under PMFME Scheme

National Institute of Food Technology Entrepreneurship and Management
Ministry of Food Processing Industries
Plot No.97, Sector-56, HSIIDC, Industrial Estate, Kundli, Sonipat, Haryana-131028

Website: http://www.niftem.ac.in
Email: pmfmecell@niftem.ac.in
Call: 0130-2281089

CONTENTS

ABBREVIATIONS & ACRONYMS

Sr: No.	Abbreviations &Acronyms	Full Forms
1.	APEDA	Agricultural and Processed Food Products Export Development Authority
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.	kcal	kilocalorie
8.	MoFPI	Ministry of Food Processing Industries
9.	PA	Polyamide
10.	PET	Polyesters
11.	PFA	Prevention of Food Adulteration
12.	SHGs	Self Help Groups
13.	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:

A cookie is a snack that is usually thin, flat and sweet, which is baked or fried. It typically contains flour, sugar and some type of fat or oil. Other could be included components such as raisins, oats, almonds, chocolate chips, etc. Beverages such as milk, coffee or tea are sometimes served with cookies and often 'dunked', a method that releases more sweetness from confections by dissolving the sugars, while still softening their texture.

Most generally, cookies are baked until crisp or only long enough to stay warm, but certain types of cookies are not baked at all. Cookies are produced in a wide range of types, using a range of materials, including Sugar, Cookies, sugar, cocoa, peanut butter, almonds, or dried fruit. The cookie's softness will be based on how long it is cooked.

Baked snacks are sweets. Most commonly made of flour, sugar, liquid and fat, a cookie is a small sweet, crispy or cake-like pastry. They are distinguished by:

- High sugar content
- High fat content
- Low moisture

The name of the cookie derives from the Dutch word koekje, meaning 'little cake.' The first cookie dates back to the 7th century A.D. In Persia, where it was first grown with sugar. Cookies are also called cookies in England and the British colonies. They are called Keks by Germans, or Plätzchen, and they are called galletas by Spaniards. Several types of cookies occur in Italy, including amaretti and biscotti. In America, the most common cookie flavor is chocolate chip.

There are three main stages in the manufacture of cookie dough:

- Creaming: to capture air cells to create a fluffy appearance, the fat or shortening is creamed with sugar. At this point, other ingredients such as salt, dried eggs, and baking powder are also added to boost the homogenization of the dough.
- Liquid incorporation: At this stage, the addition of liquids helps to disperse and homogenize the dough, and aeration continues.
- Inclusion of dry ingredients: The last stage of flour addition, or folding in of the flour, gently introduces the flour into the dough without destroying the air cells. The addition of flour at the last stage also prevents the formation of a gluten matrix, thus creating a short bite for the cookie. This results in the cookie getting a brief bite.

Cookies are manufactured in a variety of formula compositions, in many different shapes and sizes, and by different processes of manufacture. Flour, water, fat, sugar and chemical leavening are the key components.

1.3. Market Potential:

India's biscuit market stood at $3.9 billion in 2016, and is forecast to grow to $7.25 billion by 2022 at a CAGR of 11.27 percent, in value terms, during 2017-2022. The country's biscuit market is being boosted by the increasing number of health-conscious consumers, the expansion of the working population and increasing urbanization. In addition, increasing disposable income along with changing lifestyles, increasing awareness of healthy diets and changing foodstuffs. Some of the other factors that are expected to propel the consumption pattern are demand for biscuits over the next 5 years. The global market size of cookies was valued at USD 30,62 billion in 2018 and is projected to expand from 2019 to 2025 at a CAGR of 5.3 percent. Growing product popularity is expected to be the main factor fueling market development, especially in emerging regions. In addition, strong demand in industrialized economies such as the U.S., Germany, and the U.K. for chocolate cookies That

would help improve the market. By creative packaging methods and by introducing new flavor varieties, such as pineapple, bakery producers draw buyers.

1.4. Raw Material Description:

The raw materials required for Cookies is as follow:

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

Decoration/Filling:

- Chocolate Chip

Usually, a traditional cookie 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 cookies 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 cookie, **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 cookies moist and smooth.
- **Eggs** play a major role, as their intrinsic proteins function to shape the cookies, 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 cookies to achieve a sweet, golden-brown hue.

- **Flour**, thanks to its proteins which mix with water to form gluten, gives the cookie its strength and keeps all the ingredients together. As the cookie 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 cookies 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.
- Chocolate Chips: Cookies, biscuits, waffles, cookies, pudding, muffins, crêpes, sandwiches, hot cocoa, and assorted pastries can be used with chocolate chips. Many other retail food items, such as granola bars, ice cream, and trail mix, also include them.
- Butter: Butter is a dairy product made from the milk or cream components of fat and protein. At room temperature, it is a semi-solid emulsion which consists of about 80 percent butterfat. It is used as a spread, melted as a condiment at room temperature, and used as an ingredient in baking, sauce making, pan frying, and other cooking processes.
- Powder for Baking: A dry chemical leavening agent, a mixture of carbonate or bicarbonate and a weak acid, is the baking powder. By the addition of a buffer such as cornstarch, the base and acid are prevented from responding prematurely. To raise the volume and lighten the texture of baked goods, baking powder is used. It operates by releasing carbon dioxide gas via an acid-base reaction into a batter or dough, allowing bubbles to expand in the wet mixture and thereby leavening the mixture.

1.5. Types of Raw Material:

- Maida is a white flour made of wheat from the Indian subcontinent. Finely milled, polished and bleached without any bran, it closely resembles cake flour. Maida is commonly used to make fast foods, baked goods such as pastries, bread, sweets of different varieties, and traditional flatbreads. It is often branded and sold as "all-purpose flour" due to its wide range of applications, but it is distinct from all-purpose flour.
- Small chunks of sweetened chocolate are chocolate chips or chocolate morsels, used as an ingredient in a variety of desserts (notably chocolate chip cookies and muffins), in trail mixes, and less commonly in certain breakfast foods such as pancakes. They are often

produced as teardrop-shaped volumes with flat circular bases; rectangular or square blocks have the shape of another variety of chocolate chips. They are available in various sizes, usually with a diameter of less than 10 millimetres (0.39 in). Chocolate chips were originally made of semi-sweet chocolate, but there are many flavours nowadays. Bittersweet, peanut butter, butterscotch, mint chocolate, white chocolate, dark chocolate, milk chocolate, and swirled white and dark chips are all included. Melted chocolate chips, although convenient, are not always recommended as a substitute for baking chocolate. They contain less cocoa butter than baking chocolate, because most chocolate chips are designed to retain their shape when baking, and so it can be more difficult to work with melted.

CHAPTER 2
PROCESS & MACHINERY REQUIREMENT

2.1. Raw Material Aspects:

The primary raw materials for this product are maida (All Purpose flour), salt, butter, baking soda, vanilla essence, chocochips etc.

Maida

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 labeled 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 mesh per inch (31 mesh per centimeter). 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 a high gluten content, the heat generated during the milling process results in denaturing of the protein, limiting its use in the preparation of biscuits.

Choco chips

You will also find stocks of a range of chocolate chips, such as mini chips, butter chips, butterscotch chips, cacao chips, white chocolate chips, peanut butter chips, dark chocolate chips, chocolate chips, and caramel chocolate chips, aside from standard chocolate chips. Along with other baking goods, you can use these chips to have the sensation of drooling in your mouth.

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

2.2. Source of Raw Material:

The main wheat producer states in India are Uttar Pradesh is 9.75% (32%), followed by Madhya Pradesh (18.75%), Punjab (11.48%), Rajasthan (9.74%), Haryana (8.36%), and Bihar (6.82 percent). As wheat is an essential cultivable in northern India, the availability of wheat grain is simple. In every district different mandis for wheat are open. Root materials may be collected or directly from the farm milled into the Maida by these local vendors.In the procduction of cumin, India is the largest producer and buyer of cumin seed in the world. It is projected that India accounts for 70% of the world's Production of cumin crops. other raw materials for cumin biscuit is the salt butter, baking soda & Cookies can be easily procured from the markets or local venders.

2.3. Technologies:

Dough Making Technique

- **Short dough**

  This is similar to the cake dough but is much less water-related. The name refers, with respect to the flour quality, to their high levels of reduction of fat. This fat decreases the extensibility of the dough and is more likely to crack these biscuits. The paste has high sugar content, the gluten network is given very little mixture so that the strength of the sand can be compared to the watery sand that stays under pressure but collapses easily. There's even a little dough called soft dough, which again includes higher concentrations of fat and sugar that make it even softer.

Baking Technique

- **Infrared Radiation Baking**

  In order to achieve maximum texture, volume and taste, cookies require steady, gentle radiant heat. In addition, heat is easily transmitted from the steel band by conduction, allowing the cookie to expand to its final size in the first oven areas. The Indirect Radiant

Oven heating system is effectively a closed system and the energy needed from the burner is only necessary for each zone to sustain the cooking temperature. In combustion fluid, the burners draw and this is exhausted by a natural convective flue. This hot air can be used in a device for heat recovery that guarantees high fuel consumption.

2.4. Manufacturing Process:

- First of all, as a raw material bakery shortening is kept at a temperature of 8 degree Celsius to 10 degree Celsius to Colden its raw material, so that there will be no lumps issue arise at the time of mixing.
- After that sugar is grinded with the help of Sugar grinder. Then mix well the grinded sugar and bakery shortening together & for mixing use filtered water according to the season type.
- After preparation of mixture add refined wheat flour and flavours as required in it.
- In a separate pan, combine the pastry flour and chocolate chips and add them to the mixer. Mix for 15 seconds at the 1st pace; scrape down and mix for 15 seconds at the 2nd speed. At this point, do not over-mix, or you can grow the gluten network and create a tougher cookie.
- To achieve a homogeneous mixture without hydration of the flour and gluten forming, the mixing is continued at a low speed for no more than one minute. Near to the end of the mix, the chocolate chips or nuts are added and allowed enough time to spread equally over the dough.
- Shift the cookie dough to the depositor. On sheet pans with liners, deposit cookies.
- Then keep ready mixture near dropping machine, where cookies are designed according to size, type by the operator.
- Trays are then loaded to the back of machine, in which cookies start coming on the conveyor drop by drop.
- After that these trays are loaded on trolley and cookies are kept in the open for baking process at 180 degree Celsius for 25 minutes.
- After baking process cookies are send to packaging department.
- The finished product is next packaged and stored for supply.

2.4.1. Control Parameter:

There are several parameters that control the output of the biscuit making Plant, some of the important parameters are discussed below:

- **Production Rate:**

Production rate, in terms of manufacturing, refers to the number of goods that can be produced during a given period of time. Alternatively, the production rate is also the amount of time it takes to produce one unit of a good. Companies often strive for high production rates to help lower the time and cost of a project or the production process. However, a higher production rate can also lead to a decrease in quality if more mistakes are made as employees push to have more units produced or more of a building completed.

- **Baking Temperature:**

During Baking, the temperature of the product rises to a level, which varies with the oil and moisture content of the foods, but foods lose a significant fraction of their moisture &volatile oil or flavouring components due to this temperature rise, thus it needs to be maintained within a narrow margin. The Baking temperature needs to be maintained in order to prevent variation in taste as well as overcooking, for biscuits.

- **Baking Speed:**

It simply refers to the speed at which the given material is being baked, it can be measured either by actual material input & output or it can be defined by another less common method which includes utilizing baking time.

- **Mixing Torque:**

In Mixing Applications, the magnitude of torque depends on three quantities: First, the speed in revolutions per minute; second, the diameter of the propeller; and third, the viscosity of the material being mixed. Additionally, a small amount of torque is required to move the mixing device.

- **Mixing Speed:**

It simply refers to the speed at which the given set of materials are being mixed. An increase in mixing speed resulted in increased higher dough consistency independent of the mixing temperature. The mixing temperature was observed to have higher impact on dough consistency and stability than mixing speed. Softening effect of temperature was more significant at low mixing speeds.

- **Cooling Temperature:**

It simply refers to the temperature at which the given food product is being cooled, which is usually followed after cooking, heating and pasteurization. Improper cooling may also affect taste and moisture.

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- **Moisture Content:**

Moisture is the presence of a liquid, especially water, often in trace amounts. Small amounts of water may be found, for example, in the air, in foods, and in some commercial products.
It can be indirectly controlled via other parameters like various temperatures and sometimes balance is maintained by adding extra water during certain processes.

2.4.2. Quality Parameter:

There are several parameters that control the quality of the end product; some of these important parameters are discussed below:

- **Appearance:**

The most important attribute of any food's appearance is its colour, especially when it is directly associated with other food-quality attributes. Other attributes include shape, surface profile, and visible texture. Food presentation is just as essential to the success of a food product as its taste and flavour.

- **Taste:**

The gustatory system or sense of taste is the sensory system that is partially responsible for the perception of taste (flavour). Taste is the perception produced or stimulated when a substance in the mouth reacts chemically with taste receptor cells located on taste buds in the oral cavity, mostly on the tongue.
The various food products have their unique tastes any deviation from them will lead to deviation in the final dish, hence it’s essential to maintain uniform taste in processed food products.

- **Nutritional Content:**

Nutritional value or nutritive value as part of food quality is the measure of a well-balanced ratio of the essential nutrient’s carbohydrates, fat, protein, minerals, and vitamins in items of food or diet in relation to the nutrient requirements of their consumer. Higher the nutritional content of a product higher is its quality, as appropriate ingredients must have been added along with the base ingredient to elevate nutritional value.

2.5. Flow Chart:

Steps	Machine and Equipments	Description	Machine Image
Mixing	Batter mixture	This machine simplify mixes the raw material ingredients i.e. Flour with other raw materials to produce the required batter.	
Baking	Baking Oven	It's an oven with integrated conveyor in which food is cooked as it moves through the oven over conveyor belt.	
Depositing	Batter Depositor machine	This machine is sued to deposit the batter of the cookie in a tray or mould.	
Mixing	Sugar mixture	This machine is used to grind and mix sugar to the batter.	
Packaging	Packaging Machine	This machine simply packs the given product into appropriate food grade packaging for sale and distribution, which in this case are biscuits	

2.6. Additional Machine & Equipment:

Sprinkling Machine	As name suggests, this machine belongs to the class of sprinklers, which is designed to uniformly sprinkle appropriate ingredient like sugar or salt on given product.	
Oil Spraying Machine	This machine simply sprays oil over the given product in this case biscuits, in order to improve their appearance.	
Another Machine	A range of small machines are required to perform various small tasks and to support the main machines.	

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:

The nutrition information for chocolate chip cookies is focused on two big cookies, containing oil, sugar, and chocolate chips. Numbers have been determined by calorie counting (using gram measurements when available). They'll have 85 calories per cookie if you make four cookies instead of two.

SL.No.	**The nutritional value of two big cookies serving 54g**	
1.	Calories 171	Calories from fat 80
2.	Total Fat 8.8g	14%
3.	Cholesterol 1mg	0%
4.	Sodium 153 mg	6%
5.	Protein 2.5g	
6.	Total Carbohydrates 22.0g	7%
7.	Dietary Fibre 2.0g	
8.	Vitamin A 0%	
9.	Calcium 2%	Iron 4%[i]

2.9. Export Potential & Sales Aspect:

Throughout the forecast era, the Global Cookie Market is predicted to report a 5.05% CAGR. Globally, increase in the number of cafés has fuelled the cookie market. Consumers tend to enjoy a small snack with hot drinks, such as tea or coffee. The cookie has also made the ease of storage and portability a common "on-the-go" snack among consumers. The demand for oats and digestive cookies would be boosted by good eating patterns. Given the changing lifestyle of the mass public, the market for gluten-free cookies will also see a surge. In addition, customers are seeking exotic add-on ingredients, which would also contribute to demand for creative and creatively flavoured cookies during the forecast timeframe. The

biggest demand for cookies is Asia-Pacific. The big nations driving the cookie demand in the region are India, China, and Australia. In addition, government funding for the development of production plants and factors such as agro-climatic zones are fuelling the growth of the demand in these countries. North America is the cookie market's second largest country, followed by Europe. The U.K. and Germany are the main countries that dominate the European market for sweets.

CHAPTER 3
PACKAGING

3.1. Shelf Life of Product:

Bakeries or homemade cookies can be kept in the refrigerator at room temperature for two to three weeks or two months. When frozen for eight to 12 months in the fridge, cookies maintain their flavour. For seven days, moist bars, such as cheesecake and lemon bars, may be refrigerated. Store the bars in the freezer for two to three months for the highest consistency.

For soft cookies, applying a slice of bread to an airtight jar will help prolong the shelf life. The extra attachment to the bag would not be appropriate for crispy treats, such as ginger snaps. The slice of bread stops the baked goods from losing moisture so that they can sit longer on the counter while smelling new.[ii]

Depending on the quality of the food, the longer food is processed, the flavour and nutrient quality reduces when first packaged. Studies have demonstrated, however, that freeze-dried and dehydrated foods, properly packed and sealed, preserve their calories, and calories, even if preserved beyond their allocated time, can sustain life in an emergency and avoid hunger.

The shelf life of stored foodstuffs depends on the following 4 major criteria:

- Temperatures: According to results from recent research, foods kept at room temperature or colder (75 °F/24 °C or lower) can be nutritious and edible for longer than commonly assumed. Foods processed (which is optimal) at 50 °F to 60 °F can last longer than foods stored at higher temperatures. Fire kills food and its nutritious value entirely. Proteins can break down and lose certain vitamins. The taste, colour, and smell of certain foods can change as well.
- Humidity: The explanation for dehydrated or freeze-dried long-term food preservation is to remove moisture. Too much moisture fosters a climate in which microorganisms can flourish and chemical reactions in food cause degradation that can eventually make us ill.
- Oxygen: Too much oxygen, especially in fats, vitamins, and food colours, can degrade food and encourage the growth of microorganisms. That is the explanation for the dry packaging of your own food items using oxygen absorbers.

- Light: Exposure to too much light will cause food to deteriorate. In specific, it influences the colour of food, the lack of vitamins, fats and oils, and proteins. Maintain long-term food storage in places with low light with the longest shelf life.

Usually, cookies have a moisture content of less than 4 percent and a long shelf life of six or more months. Shelf life is an essential property of all food, and from source to customer, it is of importance to anyone in the food chain. In the context of effective sensory analysis, well designed and performed market acceptability assessments are an important aspect of every product's shelf life assessment. The transfer of moisture and water vapor serves as a primary element impacting shelf life.

3.2. Cookies Packaging:

To keep air and other toxins out, cookies should be kept in a tightly closed jar or covered in plastic wrap. You can freeze your cookies for a long-term alternative while retaining their flavour if you use an air-tight freezer protected jar. After freezing, for a near replication of the just baked flavour, aim to microwave them very quickly before feeding. Packaging refers to the act of designing and producing the container or wrapper of a product. It is one of the most important parts of marketing.

There are many factors that need to consider while selecting a suitable type of pack for the product:

- The product contents.
- The application of the product.
- Content stability.
- Protection from any environmental factors
- Acceptability of the pack to the customer.
- Regulatory, legal, and quality issues.

Characteristics of packaging material:

The material selected must have the following characteristics:

- ✓ Must meet tamper-resistance requirements
- ✓ Must not reactive with the product
- ✓ They must protect the preparation from environmental conditions
- ✓ Must be non-toxic
- ✓ Must not impart odour/taste to the product
- ✓ Must be FDA approved.

Biscuits is packed directly in gunny bags, gunny poly-line bags for bulk sale, and for retail sale in laminated pouches or poly-bags.

- **Hanging Bags-** Hanging bags in grocery stores and other shopping outlets are commonly used. They are a type of plastic bag that is also sealed with a back-middle seam on both ends as well. Hanging bags have a pre-cut hole that makes it easier for them to hang from hooks so that they can be seen in an attractive way.
- **Pillow bags -** A pillow bag is another typical type of package. The bags are named for their shape, which is like a cushion. They are found lying flat on grocery store shelves in the grocery store and were known to carry the items.
- **Gusseted Poly Bags-** Gusseted bags are often called flat-bottom bags because they feature a tucked in pleat that's been pressed flat. It allows the bag to expand for greater carrying capacity and to keep the shape of a box if necessary. These types of poly bags can be heat sealed, tied, stapled, or taped shut. They're the perfect poly bag for anyone looking to get more flour in a single bag.
- **Flexible Pouches-** Flexible pouches are a perfect way to carry most packaged items. They can be made with zipper-seal closures, which tend to keep the inside contents fresh for use. Flexible pouches offer amazing printing capabilities, so you can add your attractive product branding to the pouch itself. Many pouches stand up on their own, which helps you improve your shelf appearance.

3.3. Packaging:

- **Primary packaging:** Primary packaging is packaging which is in close association with the product itself and is often referred to as a consumer unit. The main purpose of the primary packaging is to contain, protect and/or conserve the final product, in particular against contamination.
- **Secondary packaging:** Secondary packaging is the outer packaging of the main packaging, which connects packages and further covers or marks the prescription component.
- **Tertiary packaging:** Tertiary packaging is used for the handling, transportation, and delivery of bulk products.

3.4. Material of Packaging:

In addition to cellulose and Aluminium foil, a very large amount of polymeric materials is used for packaging products. Paper boards and metal containers are also used for such

purposes. While a range of packaging materials are available, the ultimate option of the packaging depends on the appropriate shelf life, the efficiency of the packaging machine, and the cost that is purely based on the market segment targeted by the manufacturer. The most common choice of packaging medium is plastic (usually flexible) as it offers the requisite safety and preservation, resistance to grease, physical strength, machinability, and printability.

Plastics that are lighter in weight are also the most preferred material for the packaging of flour. There are changing trends in the packaging of Flour. Plastic films and their laminates are increasingly used due to better properties and aluminium laminates due to price and better flex crack properties. Plastic packaging products that can be used are described below.

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.

Poly Vinyl Chloride (PVC)- PVC is a stiff and clear film having a low gas transmission rate. PVC can be used as small wraps, bags, and pouches. PVC when co-polymerized with polyvinylidene chloride is known as Saran. Since it is a costly material, it is only used as a coating to obtain barrier properties and heat salability. PVC film is also used for twist wraps, as it has twist retention properties and is excellent on high-speed machines.

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.

CHAPTER-4
FOOD SAFETY REGULATIONS AND STANDARDS OF COOKIES

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

2.1.7: Dairy Based Desserts/ Confections

Ice Cream, Kulfi, Chocolate Ice Cream or Softy Ice Cream(hereafter referred to as the said product) means the product obtained by freezing a pasteurized mix prepared from milk and /or other products derived from milk with or without the addition of nutritive sweetening agents, fruit and fruit products, eggs and egg products, coffee, cocoa, chocolate, condiments, spices, ginger and nuts and it may also contain bakery products such as cake or cookies as a separate layer and/or coating. The said product may be frozen hard or frozen to a soft consistency; the said product shall have pleasant taste and smell free from off flavour and rancidity; the said product may contain food additives permitted in these regulation including the said product shall conform to the microbiological requirements specified below; the said product shall conform to the following requirements, namely:—

Total Solid	Not less than 36.0 percent	Not less than 30.0 percent	Not less than 26.0 percent
Wt/Vol (gms/l)	Not less than 525	Not less than 475	Not less than 475
Milk Fat	Not less than 10.0 percent	More than 2.5 percent but less than 10.0 percent	Not more than 2.5 percent
Milk Protein (Nx6.38)	Not less than 3.5 percent	Not less than 3.5 percent	Not less than 3.0 percent

[iii]

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 equipment's 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 coloring 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 Labeling) Regulation 2011" and the Compendium of Food Safety and Standards (Packaging and Labeling) 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 Labeling Regulation 2011, "prepackaged" or "pre packed food" including multi-piece packages, should carry mandatory information on the label.

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.

Reference:

[i] https://chocolatecoveredkatie.com/chocolate-chip-cookie-nutrition-information/

[ii] http://www.eatbydate.com/grains/baked-goods/cookies-shelf-life-expiration-date/

[iii] https://www.fssai.gov.in/upload/uploadfiles/files/Food_Additives_Regulations.pdf