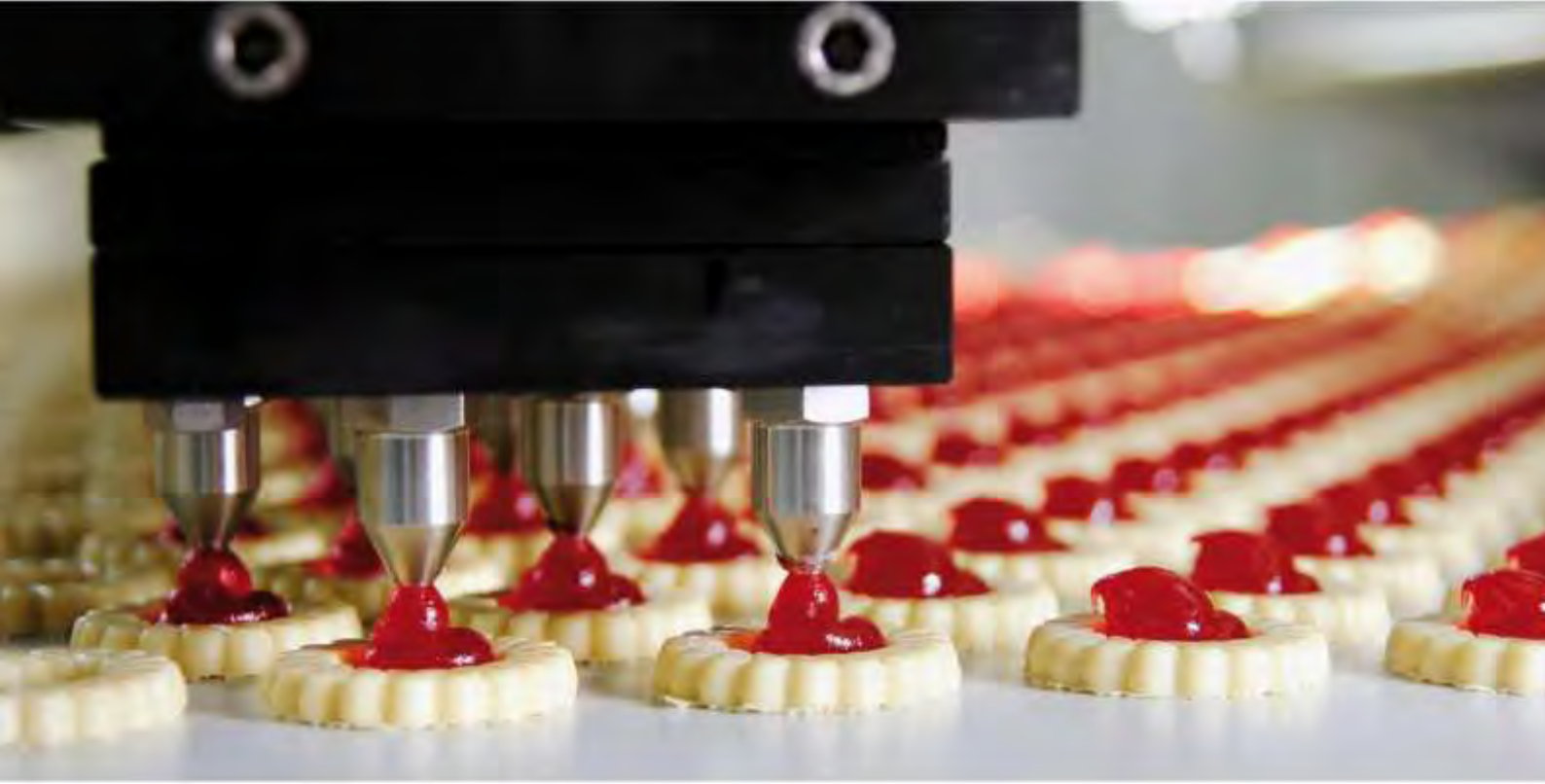


PLANT BISCUIT PRODUCTION SPECIALIST




Participant Handbook

QUALIFICATION PACK

Plant Biscuit Production Specialist

Sector : Food Processing

Sub-Sector : Bread and Bakery

Occupation : Processing

Reference ID : FIC/Q3003

NIFTEM

FICSI
Food Industry Capacity and Skill Initiative

Ver 2.0

Contents

Introduction to Food Processing

At the end of the session, you will be able to:

- list the various sectors of food processing industry;
- define food processing and preservation.

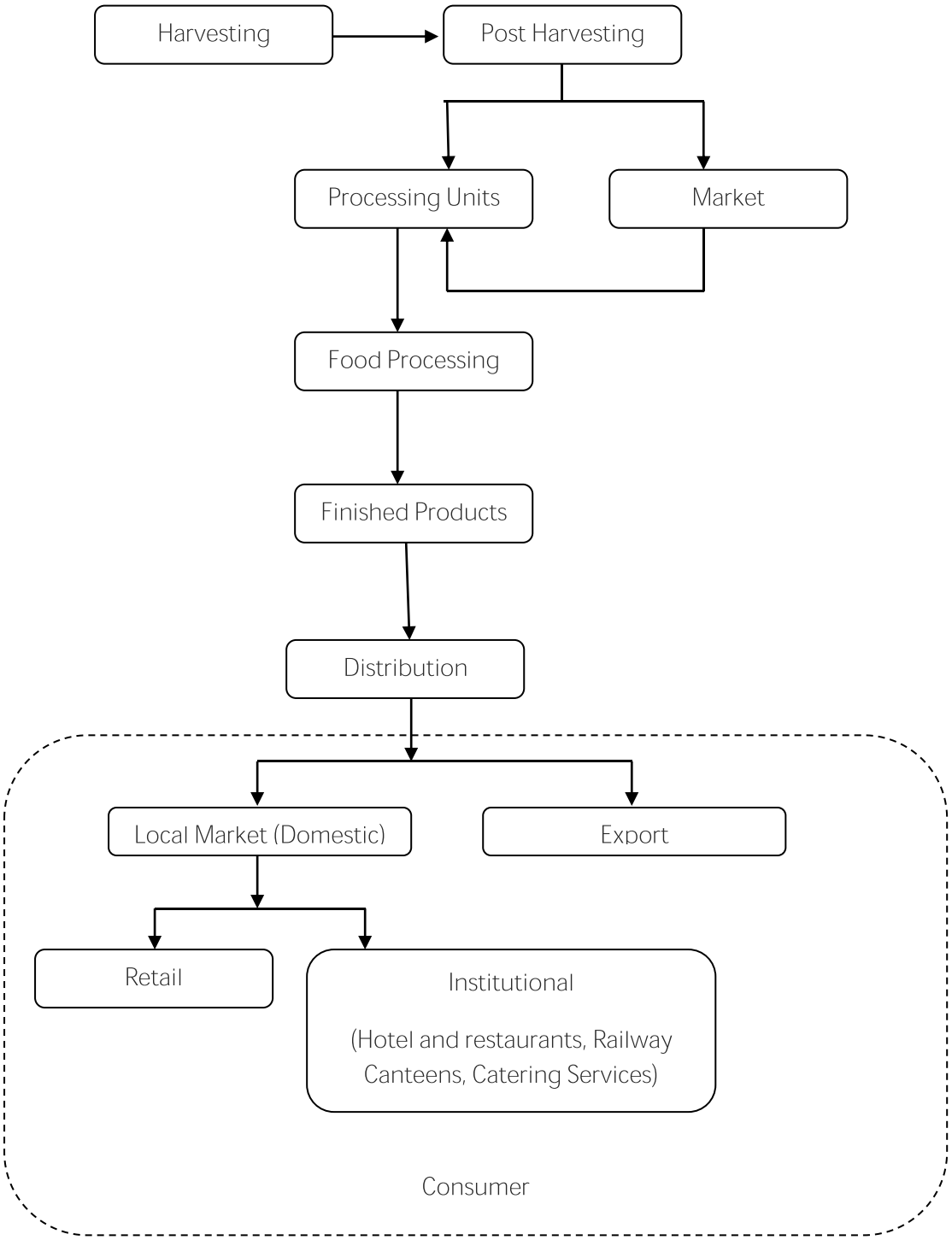
Food Processing

Agriculture is the backbone of the Indian economy. The produce from various agriculture-based occupations is primarily used for consumption within the country. It is exported to different parts of the world as well. Agricultural produce is also used as baking ingredient in the food processing industry.

Food processing is the method used to convert baking ingredients into food products. They could be processed foods, ready-to-eat foods, food additives or foods used to prepare other food products. Besides food processing, the food industry also relies on food preservation as an important method to store food products for longer periods of time.

The food processing industry in India is divided into several sub-sectors. They are:

Sub-Sectors	Produce
Dairy	Whole milk powder, skimmed milk powder, condensed milk, ice-cream, butter and ghee, cheese, etc.
Fruit and vegetable processing	Beverages, juices, concentrates, pulps, slices, frozen and dehydrated products, potato wafers, pickles, etc.
Grains and cereals	Flour, bakeries, starch glucose, cornflakes, malted foods, vermicelli, beer and malt extracts, grain-based alcohol, etc.
Fisheries	Fish oil, frozen and canned products, etc.
Meat and poultry processing	Frozen and packed meat, egg powder, etc.
Bread and bakery	Biscuits, breads, buns, cakes, confectionery, pastries, cookies, etc.
Dairy	Whole milk powder, skimmed milk powder, condensed milk, ice-cream, butter and ghee, cheese, etc.
Consumer foods	Snack foods, namkeen, biscuits, ready-to-eat foods, alcoholic and non-alcoholic beverages, etc.


Harvesting
Post Harvesting
Processing Units
Market
Food Processing
Finished Products
Distribution
Local Market (Domestic)
Export
Retail
Institutional
(Hotel and restaurants, Railway Canteens, Catering Services)
Consumer

Overview of Baking Industry and Bakery Products

At the end of the session, you will be able to:

- list the various products of the bread and bakery sub-sector;
- list the various types of industries within the bakery sub-sector.

Introduction to the Bread and Baking industry

A bakery is an establishment that prepares baked goods. Following is a list of baked products manufactured in the baking industry.

- Breads and buns
- Cakes
- Croissants
- Cookies
- Biscuits
- Crackers

Depending upon the size of the organization, the volume of production, and the turnover, the bread and bakery sub-sector is divided into:

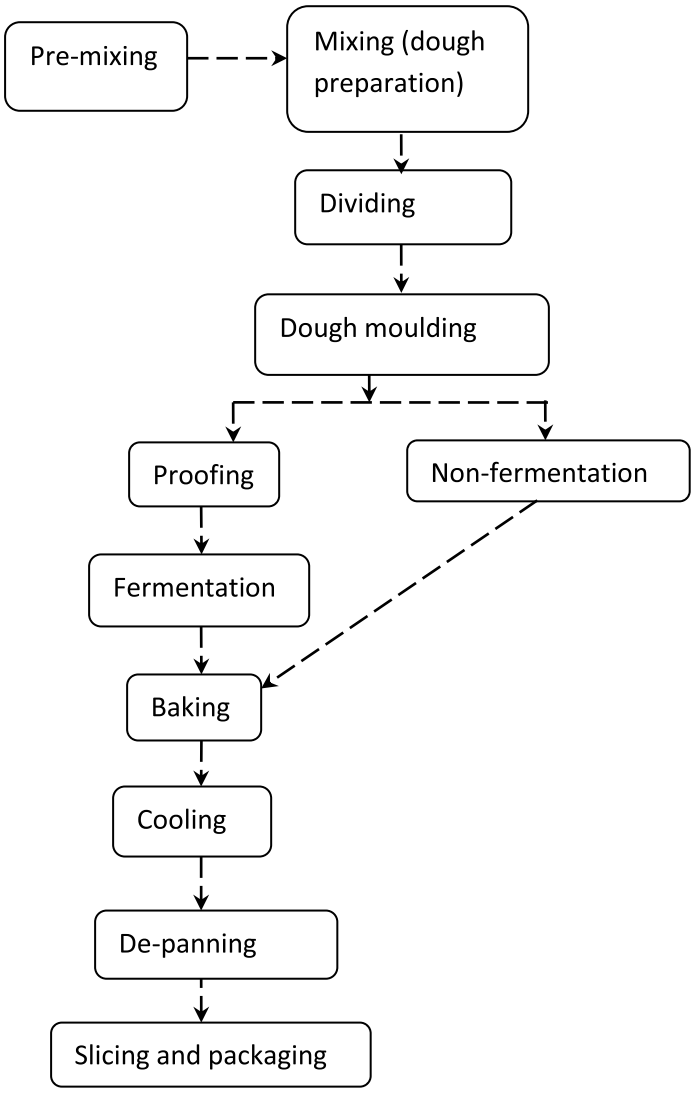
- Small industries (includes tiny, home, and cottage industries);
- Medium industries
- Large industries

Overview of the Baking Process

Baking is the method of cooking food with the help of dry heat that is controlled in an oven, hot ashes or hot stones. A combination of three forms of heat is used for the baking process. These three forms are:

Radiation	Hot Air Circulation	Conduction
• Heat is radiated from walls of the oven	• Hot air is blown in circles inside the oven	• Heat is conducted through baking pan or tray

Following is a process chart giving an overview of the entire process of baking:



Introduction to Biscuit Industry

At the end of the session, you will be able to:

- list the types of biscuits;
- classify biscuits as per the dough.

The bakery sector can be differentiated into three broad segments. They are: bread, biscuits, and cakes. The biscuit segment has seen a rapid growth in the last few years. These have gained popularity among the masses. Changes in eating habits along with becoming increasingly popular have enabled the bakeries to produce a variety of products.

Overview of the Biscuit Segment

It is one the most popularly eaten product across the world as it can be carried around easily and is easily available. They come in various shapes and sizes and have multiple names. Some of them include:

- Cookies
- Biscotti
- Crackers
- Biscuits
- Animal crackers
- Cream biscuits

Introduction to biscuits:

These products are cereal based and baked to moisture content of less that 5%‘.

Types of biscuits:

- Cream crackers
- Soda crackers
- Savoury or snack crackers
- Water biscuits and matzos
- Puff biscuits
- Hard Sweet , Semi Sweet & Garibaldi Fruit Sandwich Biscuit
- Short dough biscuits
- Deposited soft and sponge drop biscuits
- Wafers
- Miscellaneous biscuits-like products

Classification of Biscuits

Biscuits are classified on the quality of the dough type.

Soft dough	Hard dough	Puffed	Others
• Sweet biscuits • Dough is soft • Dough has high sugar level • Also called sweet biscuits • Examples: Glucose, nice, etc.	• Semi-sweet biscuits • Strong hard dough • Dough has low sugar and fat levels hence called tea biscuits • Examples: Marie, arrow root	• Salted biscuits • Fermented dough • Dough has high level of fat hence called salted • Examples: Crackers	• These are made from various combinations of doughs • Can be fermented • Examples: Wafer, milk/cream, etc.

Roles and Responsibilities of Plant Biscuit Production Specialist

At the end of the session, you will be able to:

- state the roles and responsibilities of a plant biscuit production specialist.

Roles and Responsibilities

The following table provides detailed information about the roles and responsibilities of a plant biscuit production specialist.

Roles	Responsibilities
Handle baking ingredient from storage to the process line	• Check baking ingredient for quality • Ensure ingredients are free from dirt, debris, foreign matter, glass, and insects • Ensure minimum loss of baking ingredients
Record-keeping and documentation	• Document and maintain records of baking ingredients • Document and maintain records of production schedule and process • Document and maintain records of finished products
Hygiene and sanitation maintenance	• Adopt safety- and sanitation-related measures • Follow food safety norms and practices
Inspect machines and troubleshoot issues	• Ensure smooth operation of machinery to complete production line • Optimize the use of machinery • Attend to minor repairs of tools and machinery when required • Ensure that safety rules and regulations are observed • Prevent accidents • Escalate issues to the supervisor
Plan and execute baking process	• Examine products at different stages of baking • Adhere to Good Manufacturing Practice (GMP) • Ensure the products meet the quality standards set by the organization • Report any problems, especially during production, to supervisor
Inspect intermediate as well as finished products	• Check proofing and finished products for quantity, quality, and taste • Ensure conformance of quality as per organizational standards
Follow storage and packaging norms	• Ensure safe and proper storage of baking ingredient, packing material, and finished goods

Workplace Ethics

At the end of the session, you will be able to:

- state the standard operating procedures in the baking industry.

How to Conduct Yourself at the Workplace

Workplace ethics are set of guidelines that are followed to ensure smooth and effective functioning of a workplace. Some important ones to remember are:

- Address seniors, assistants, and workers with respect
- Follow the process flow in the manufacturing unit
- Ensure proper execution of the pre-production, production, and post-production plan
- Follow food safety norms at all times
- Do not compromise on the quality of the product at any given cost.
- Perform your work with complete honesty
- Perform all your roles and responsibilities with integrity
- Teamwork takes you a long way

Sanitation and Hygiene

At the end of the session, you will be able to:

- state the personal hygiene and sanitation guidelines;
- state the food safety hygiene standards to follow in a work environment

Personal Sanitation

Sanitation and hygiene are the most important aspects to take care of when working in the food processing industry. Some important sanitation and hygiene practices that must be followed are:

- Maintain a high standard of personal cleanliness viz. have a bath every day and wear clean clothes to work.
- Wear Personal Protective Equipment (PPE) such as aprons, mouth mask, head cover, face mask, hand gloves, gum boots, and beard cover mask at all times during work hours.
- Always keep your finger nails trimmed.
- Always keep your hair trimmed and wear hair net while working.
- Wash your hands and feet at the designated area or wash stations provided.
- Wash your hands with soap and water each time before you enter the production area.
- Refrain from smoking, spitting, chewing paan, sneezing or coughing over any food when in the production area.
- Do not handle food when suffering from a disease, illness, burns, injury or infection.
- Take proper and timely medical treatment when you are ill or if you have met with an accident.
- Visit a registered medical practitioner at regular intervals to keep a check on your health.

Equipment Used in the Baking Process

At the end of the session, you will be able to:

- identify the different equipment used in the baking process.

Equipment Used in the Process of Baking

The tools and equipment used in the process of baking are:

Name of the equipment	Use and operation
Sifter	• It is used to separate coarse grains and fine particles of flour using flat sieves. • The main parts of a sifting machine are the drive mechanism and the set of sieves. • The flour is separated from the grains by horizontal or inclined sieve and sifted into three to six groups as per particle sizes.
Mixers	• It is used to mix cake batter and make whipped cream, dough, icing, and fillings. • There are two types of bakery mixers: planetary and spiral. • A planetary mixer's mixing arm is set in a planetary motion without motion of the bowl and is used for all products. • In spiral mixer, the bowl of the mixer rotates and the hook spins at the same time while spinning and kneading the dough in spiral manner. • It is used to knead and mix dough for bread, bagels, and pizza crusts.
Divider/rounder	• It is used to divide dough into equal proportions. This motor-driven machine is usually used for bread dough.
Dough sheeter	• It is used to roll out dough into a (consistent) sheet with the desired thickness. • Dough is compressed between two or more rotating rollers to produce a consistent sheet. • This equipment is used especially for pastries and biscuits.
Dough moulder	• It is used to give uniform shape to the dough at high speed. • It is highly efficient in terms of fuel and energy consumption. • It is used to get the desired shape of biscuit, cookie or cake.
Proof box/proofers	• It is a sealed space that provides the right environment and encourages fermentation of dough by yeast. • This is done by providing warm temperature and controlled humidity.
Proof box/proofers	• It is a sealed space that provides the right environment and encourages fermentation of dough by yeast. • This is done by providing warm temperature and controlled humidity.
Laminator	• It is used to make sheets leaner giving bite and texture to biscuits.

	• Depending on the orientation, laminators are classified as vertical and horizontal.
Gauge roll stand	• It is used to make dough thin and roll them.
Baking oven	• It is used to bake or roast food in an enclosed compartment or receptacle.
Depositors	• It is used to deposit accurate portions of batter.
Rotary cutter	• It is a pair of rollers with various shapes used for cutting the dough as per the desired shape of the biscuit.
Sprayers/coaters	• It is used for coating or spraying ingredients on baked products to give them a glazed look.
Dusters	• They are used for dusting sugar and/or salt on biscuits.
Cooling conveyor	• It is used for cooling baked products.
Packaging machinery	• It is used for packaging finished products.

Types of Ovens

Ovens are the most important equipment required in the baking process. Different types of baking products require different baking processes. Hence, different types of ovens are used. The following table gives details about the ovens used in the baking industry.

Cabinet type	**Mechanical**	**Masonry**
• Rack ovens and deck convection ovens	• Reel oven and continuous tunnel convection	• Wood fire ovens • Used in private shops and cafes • Optimum temperature of 450°C is maintained
• Large sheet pans can be wheeled for baking in various heights	• The product moves on a conveyor belt inside the oven. • Useful for uniform baking of biscuit	Black ovens: • Heated by burning wood in chamber • The product is cooked in the same chamber
• Small and medium size bakeries use rack, deck, and reel ovens for baking. • Large bakeries use continuous convection ovens as they are economical		White ovens: • Heated by heat transfer • The product is baked in a different chamber

Precautions and safety measures to follow while handling baking equipment:

- Avoid direct spillage of water on electrical components.
- Clean the tools and equipment before and after each operation.
- Ensure regular maintenance of machinery
- Do not open machines with sharp knives during operation. It is safe to open a machine when it is unplugged from an electrical source.
- Regularly check machines like ovens for efficiency of valves.
- Ensure the build-up of heat for such machines is always under control.
- Ensure all controls of all the machines are set to prescribed limits

Materials and Equipment Used for Cleaning and Maintenance

At the end of the session, you will be able to:

- state the materials and equipment used in cleaning and maintenance of the work area and machineries.

Cleaning and Sanitization

Cleaning and sanitization of the work area is extremely important for every food-handling operation. Hence, it is important to know:

- What types of materials and equipment must be used to clean the work area?
- How to use these materials and equipment?
- The method of cleaning the work area
- The frequency of cleaning the process machineries

The food processing industry follows standard procedures for cleaning the work area. This is to ensure that there is no bacterial growth due to presence of leftover food particles. For cleaning purposes, the work area is divided into two. They are:

Food contact surfaces	Non-food contact surfaces
Work tables	Overhead structures
Utensils	Walls, ceilings, and shields
Equipment	Lighting equipment
Tools	Refrigeration equipment
Machines that process foods	Air conditioning, heating or ventilating systems

Equipment, Chemicals, and Sanitizers Used for Cleaning

Every organization in the food processing industry follows a cleaning schedule. For instance, a processing unit may follow a weekly, monthly or yearly cleaning schedule. To clean the processing unit, the following equipment and tools are used:

- Cleaning or washing tank
- Cleaning knives and spoons
- Cleaning or sanitizing agents
- Cleaning brushes and scrubbers
- High spray nozzle jets

Some common types of cleaners and sanitizing agents to clean the food contact and non-food contact surfaces are:

Cleaning agents	Used for	Risk	Safety measure
Hypochlorites like potassium hypochlorite, sodium hypochlorite, and calcium hypochlorite	Cleaning stainless steel food contact surfaces	Leads to corrosion	Ensure pH and concentration levels are maintained
Liquid chlorine	Internal cleaning of stainless steel equipment and vessels	Leads to corrosion	Ensure concentration levels are maintained
Hydrogen peroxide	Killing bacterial spores, pathogens, spoilage organisms, and other microorganisms	Has a strong odour	Use in well-ventilated and open spaces
Ozone	Cleaning food-contact and non-food-contact surfaces like equipment, walls, floors, drains, conveyors, tanks, and other containers; Killing microbes	No risk involved since it leaves no residue	Safe to use

Types of Cleaning Processes

At the end of the session, you will be able to:

- state the cleaning processes used to clean the work area.

Clean-In-Place (CIP)

CIP is a method used for internal cleaning of machineries. It is done without dismantling pipes, vessels, process equipment, filters or fittings. In this process, a sanitizing agent is circulated through the entire processing unit with the help of a spray ball. The turbulence created removes soil, ensuring removal of bacteria and chemical residues.

Tips to conduct an effective CIP process:

- Use the right vessels for the right process
- Use the right cleaning and sanitizing solutions
- Ensure correct flow rate
- Ensure all connections are clean
- Monitor and verify the entire process

Clean-Out-Of-Place (COP)

COP is conducted at a cleaning station. This method involves dismantling of the equipment. In this process, equipment and units are scrubbed with soap in COP tanks. After this, the tanks are rinsed again to remove residual detergent or chemicals. Equipment and units are reassembled and sanitized once more with heat treatment or sanitizing agent.

Tips to conduct an effective COP process:

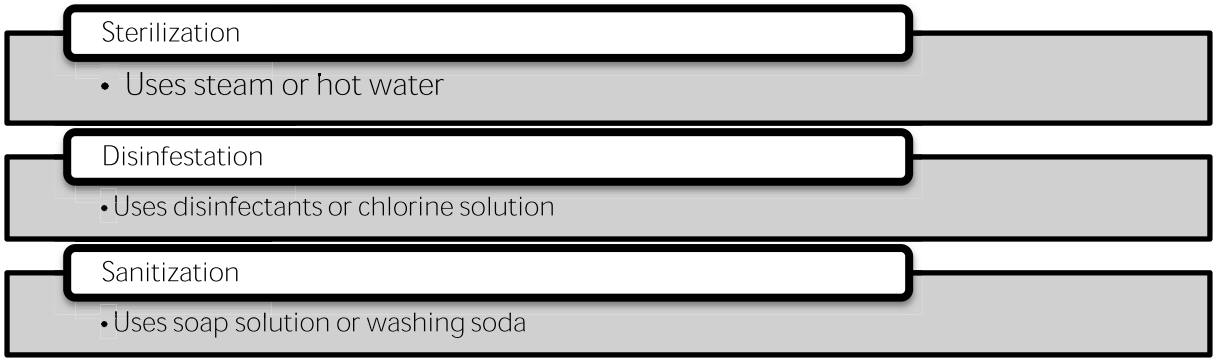
- Follow the order of tasks
- Use cleaning tanks as much as possible
- Ensure tools used in COP do not lead to contamination

Food processing equipment and units that undergo the COP process are:

- Fittings
- Gaskets
- Valves
- Tank vents
- Grinders
- Pumps
- Knives
- Nozzles

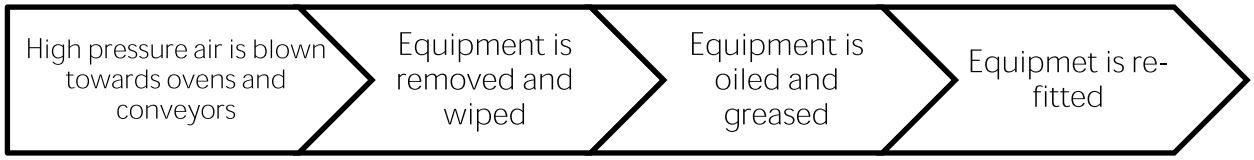
Sterilising-In-Place (SIP)

- SIP is the process by which food-processing equipment is sanitized after the CIP process. It helps to eliminate any residual microbiological contamination.
- SIP is a combination of three processes viz. sterilization, disinfestation, and sanitization.



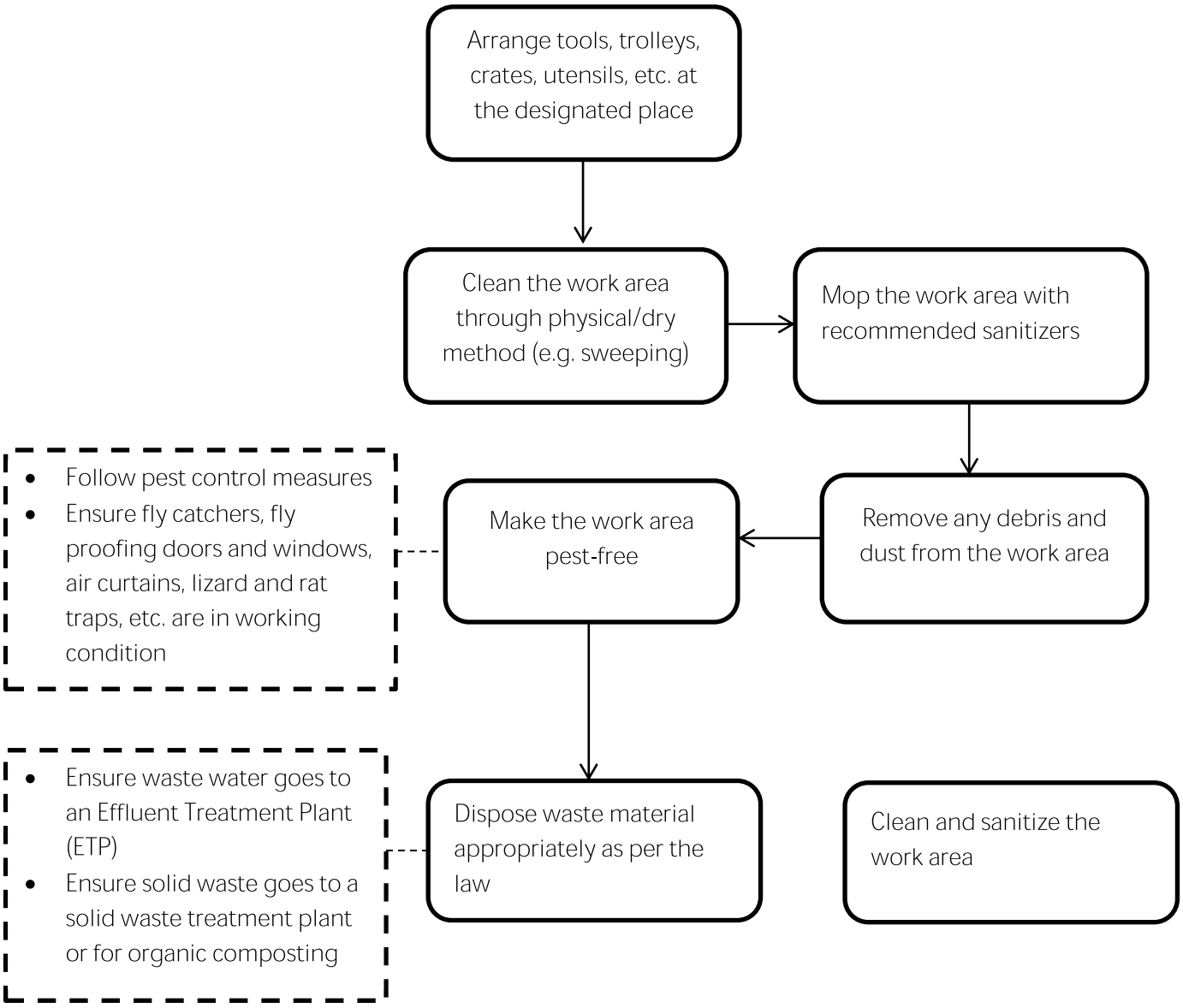
Air-Pressure Cleaning

The baking industry follows the air-pressure cleaning method to ensure cleanliness of regularly used equipment. The following chart explains the process in detail:



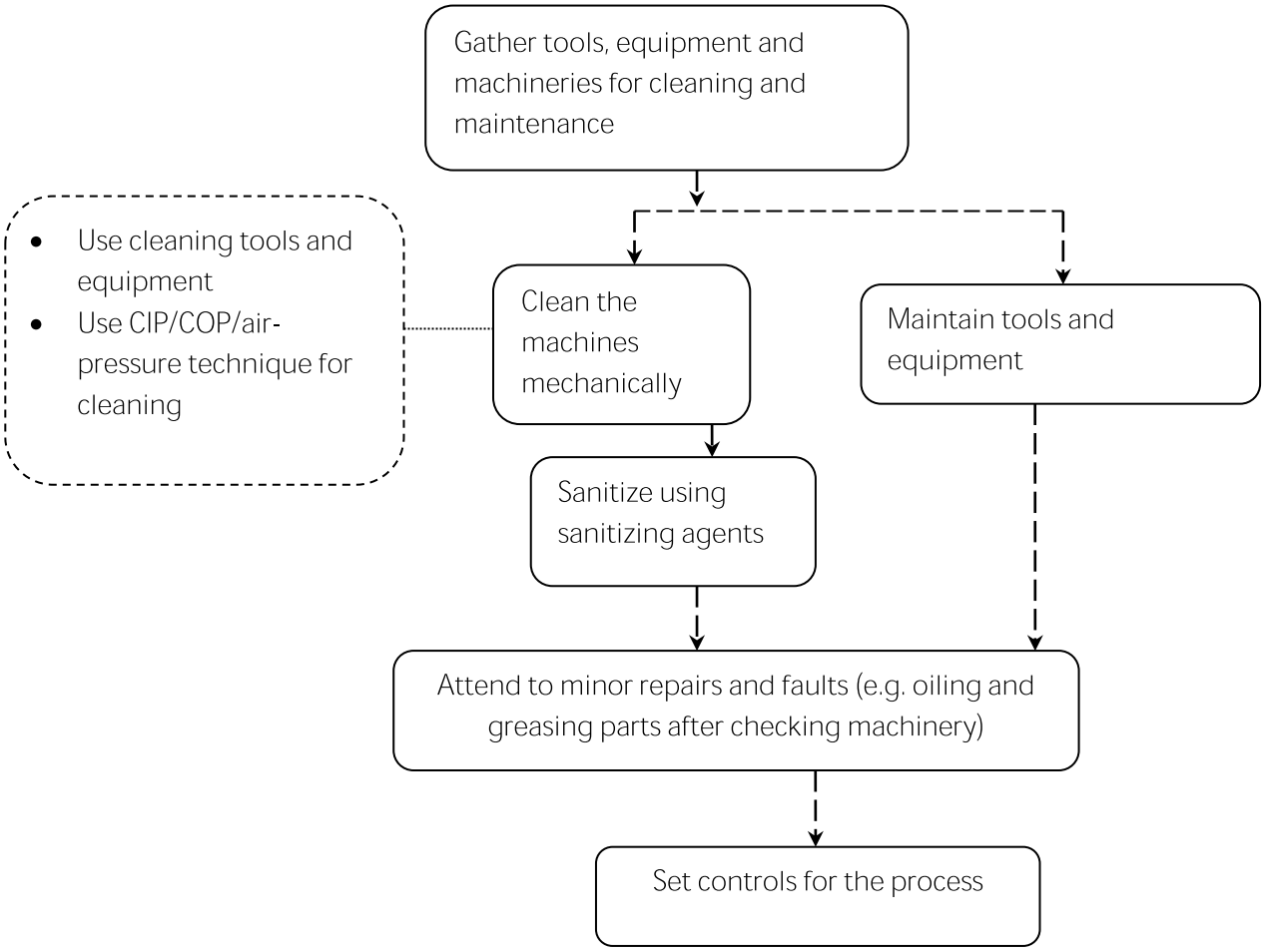
Process of Cleaning the Work Area

The following chart explains the process of cleaning the work area before production. The dotted boxes explain pest-control measures and methods used for waste material disposal in detail.



Process of Cleaning Machineries, Tools, and Equipment

The chart explains cleaning of machineries, tools, and equipment used in the baking industry. The dotted chart states the techniques used for mechanical cleaning of equipment.



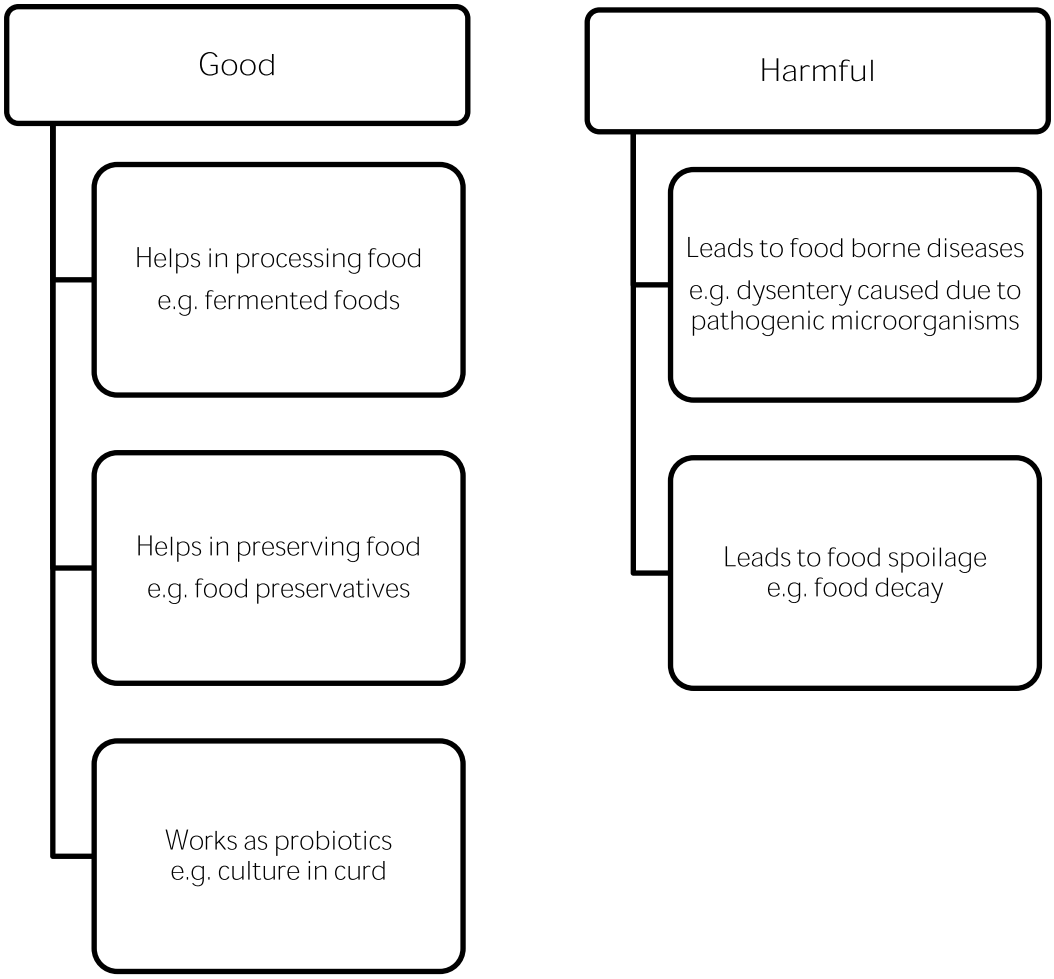
Introduction to Food Microbiology

At the end of the session, you will be able to:

- state the types of food microbes.

What is Food Microbiology

Food microbiology is the study of microorganisms found in food products. Microorganisms are classified as:



Food Spoilage

At the end of the session, you will be able to:

- state the causes for food spoilage;
- state the process for food spoilage;
- state the criteria to check food spoilage.

Types of Food Contaminants

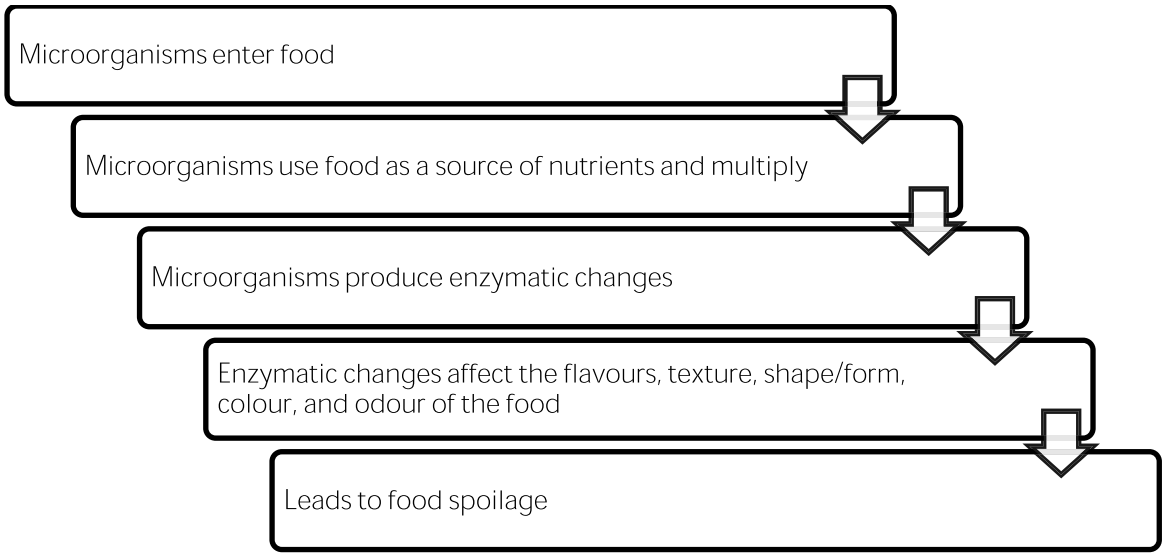
Food spoilage is the process by which the original nutritional value, texture, flavours, and the form of food is damaged. The food then becomes harmful and unsuitable for human consumption.

Some types of contaminants in foods are:

Types of contaminant	Examples
Microbial	Bacteria, moulds, yeasts, viruses, etc.
Biological	Hair, excreta, bone splinters, etc.
Chemical	Pesticide residues, detergents, etc.
Physical	Bolts from machinery, stones, glass, etc.

Process of Food Spoilage

The following process chart shows how food spoilage takes place:



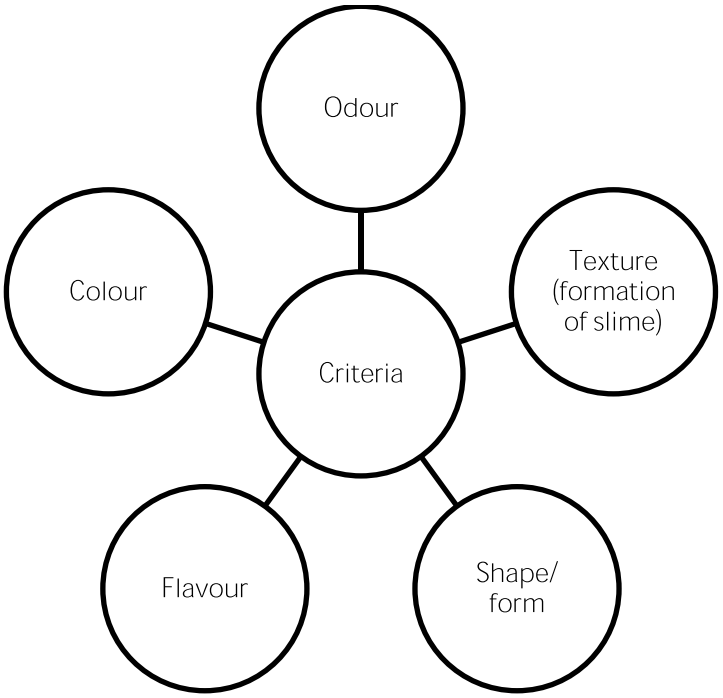
Classification of Food Based on Spoilage

The following table shows how food is classified based on spoilage.

Non-perishable foods	Semi-perishable foods	Perishable foods
Does not spoil unless handled carelessly E.g.: Sugar	Spoils only if handled carelessly or stored improperly E.g.: Potatoes	Spoils readily and needs to be stored with special preservatives/processes E.g.: Milk

Criteria to Check Food Spoilage

This chart will help you to check food spoilage based on the parameters listed below.



Food Preservation

At the end of the session, you will be able to:

- state the need for food preservation;
- state the different types of food preservation processes.

What is Food Preservation

Food preservation is the process by which processed and unprocessed food is protected against microbes, spoiling agents, and contaminants. The objective of preserving processed food is to:

- retain the original nutritive value
- retain the original colour
- retain the original flavour
- retain the original texture of the food
- extend the shelf life of the food
- ensure year-round availability
- prevent or delay spoilage

Common Methods of Food Preservation

The most commonly followed methods of food preservation are:

- Fresh storage
- Cold storage
- Freezing
- Drying/dehydration
- Concentration
- Chemical preservation
- Preservation with sugar
- Pasteurization
- Sterilization
- Filtration
- Irradiation
- Curing
- Fermentation
- Salting

Plan Production Sequence

At the end of the session, you will be able to:

- plan the production sequence to maximise capacity utilization of resources, manpower, and machinery;
- calculate batch size based on the production schedule and machine capacity;
- prioritize urgent orders based on the production schedule;
- check the conformance of baking ingredient quality to company standards.

Planning the Production Sequence

The chart explains the planning process of baking

Baker's Math

At the end of the session, you will be able to:

- state the units of measurement used in the food processing industry.

Baker's Mathematics:

Baker's mathematics is a method of breaking down ingredients into proportions as per requirements by scaling up or down. In baker's math, every ingredient is expressed in terms of the flour weight, which is always expressed as 100 percent.

For example: A typical formula for bread:
Flour: 100%
Water: 70%
Salt: 2%
Instant yeast: 1%
Total: 173%

To make bread with 200 grams of flour, the weight of the other ingredients is

- Water: 200 *70% = 140 grams
- Salt: 200 * 2% = 4 grams
- Instant yeast: 200 *1% = 2 grams

To make 1 kilogram of dough, divide the total of all the ingredient percentages added up (173% = 1.73) into the total weight of the dough:

1 kg = 1000 gms
1000 grams / 1.73 = 578 grams of flour (rounded to nearest gram).

Now the flour weight is = 578 gms, the weight of other ingredients will be:
Water = 578 * 70% = 404 grams (rounded)
Salt = .02 * 578 = 12 grams (rounded)
Instant yeast = 578*1%= 6 grams (rounded)

Formulas:

- To find out what percentage each ingredient is:

  Ingredient Percentage=Ingredient Weight/Total Flour x 100

- To find out what the required weight of each ingredient is needed:

  Ingredient Weight=Ingredient Percentage x Total Flour Weight

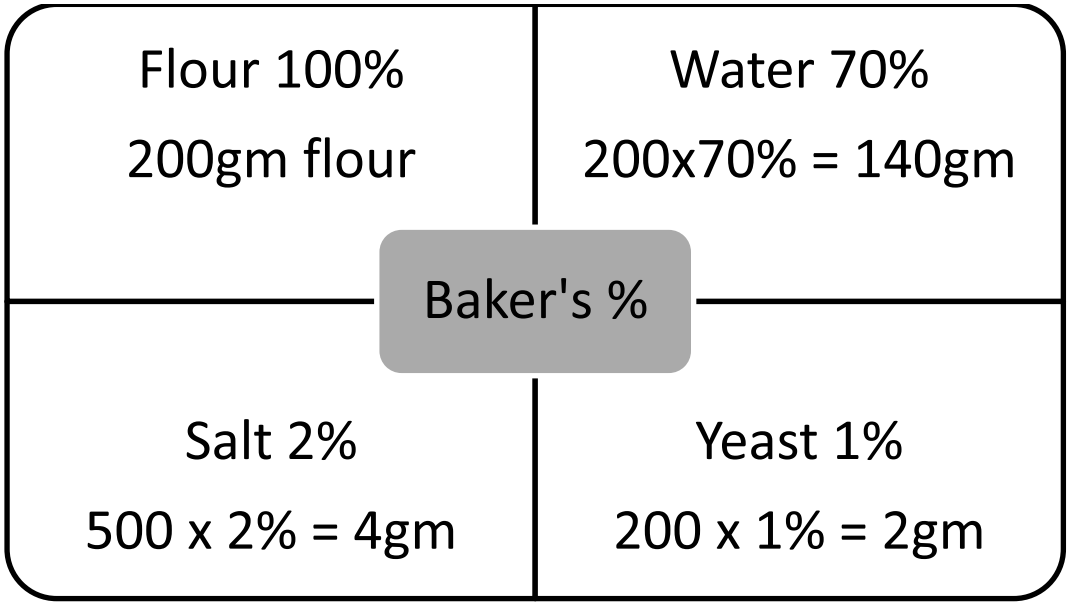
- The total flour weight is given by:

  Total Flour Weight=Total Weight of the dough/Total Percentage of all the ingredients

Baker's percentage is a baker's notation method indicating the flour-relative proportion of an ingredient used when making breads, cakes, muffins, and other pastries.

Baker's percentages enable the user to:

- compare recipes more easily (i.e., which are drier, saltier, sweeter, etc.).
- spot a bad recipe, or predict its baked characteristics.
- alter or add a single-ingredient percentage without changing the other ingredients' percentages.
- measure uniformly an ingredient where the quantity per unit may vary (as with eggs).
- scale accurately and easily for different batch sizes.



Baking Ingredients used in the food processing industry are selected in specific quantity. They are measured in metric units (kg, g, ml etc).

Some common units of measurements used are:

Ingredient	**Unit of measurement**
Dry ingredients	Kilogram(kg) or gram(g), teaspoon (tsp), tablespoon (tblsp), Ounce (oz), tea cups (c), pound
Liquid volume	Litre(L) or millilitre (ml), Ounce (oz)
Temperature	Degree Celsius (°C) or Fahrenheit (°F)
Duration	Time (minutes, hours, seconds)

Overview of Baking Ingredients

At the end of the session, you will be able to:

- identify the baking ingredients required for production as per production schedule and formation;
- organize quality baking ingredient as per production process and company standards.

Baking Ingredients Used in the Baking Industry

The main ingredient used for baking is flour. The most commonly used flour is wheat flour. Flours are graded into strong and soft by the type of milling. Strong flours are flours with hard high protein varieties. Soft flours are flours with low protein varieties.

The baking ingredients in the baking industry are divided into groups as per their roles. The following table explains this classification.

Role	Type of baking ingredient	Function
Structure builder Materials that form the base and act as the binder in a product	Flour	• Hold other ingredients for uniform dough mixing to make dough • Produce gases during fermentation and retain them during baking
	Egg	• Whipped egg forms foam which acts as a leavening agent • Provides colour and flavour
	Milk powder	• Provides enrichment • Provides wholesome flavour, colour, and taste
Tenderiser Materials that give softness/fluffiness/ crunchiness to the product	Sugar	• Imparts sweet taste • Softens gluten • Gives colour • Imparts texture
	Salt	• Strengthens and tightens the dough • Compacts the gluten protein to hold carbon dioxide • Gives taste to product
	Shortening (fats like butter, margarine, vegetable oil)	• Imparts shortening effect to the dough • Makes the dough more extensible • Improves the taste
	Baking chemicals like baking powder	• Aerates products to make them porous and crisp
Moisteners Material that gives slight wetness to the product	Water	• Helps to mix the ingredients to make uniform dough • Helps in gluten development during mixing • Helps in airing of product
	Antioxidants	• Helps to check rancidity of products, keeping them fresh
	Liquid part of milk	• Helps in the development of gluten
	Egg	• Provides nutritive value
Flavouring agents	Flavour and colour	• Imparts and improves specific flavour and

Materials that enhance the taste	(synthetic or natural)	colour to the products
	Chocolate and cocoa products	• Provides a characteristic aroma and taste
	Fruits and nuts	• Adds a specific taste to the products
	Other cereal flours and starches	• Dilutes the effect of strong flours • Imparts specific taste and flavour to the product
Emulsifiers/additives Materials which help in mixing flavouring agents and fats	GMS (Glycerol Monosterate) lecithin, SSL (Sodium Stearoyllactylate) are commonly used	• Helps in uniform dispersion of fats and fat soluble colours and flavours in water.

Quality Parameters

While selecting baking ingredient for the baking process, certain quality parameters have to be met. They are:

Baking ingredient	Bread	Biscuits/cookies	Cake
Flour (clean, characteristic taste and smell, free from insects, fungus infection, rodent contamination and dirt, dusted bran particle, and other foreign matter	High protein, strong flour, good water absorption (60-65 %), high starch, bit granulated (medium)	Soft flour, water absorption of 55 %, fine flour; Certain biscuits require strong flour	Soft flour, low water absorption of 50 %, fine flour
Sugar (according to different particle size used are: granular sugar (6-30 mesh), castor sugar (30-80 mesh), pulverized sugar (80-120 mesh), and icing sugar (120 mesh and above)	Powdered sugar if required, sugar acts as the substitute for honey or molasses	Fine powdered sugar or glucose, malt extract fructose, honey	Fine powdered sugar/sugar syrup which is de-odorized by passing through activated charcoal and is clear in colour is used
Milk/milk products	Dry milk, which has very less fat content but high water absorption	Milk powder in water	Toned milk
Fat	Oil with low viscosity	Hydrogenated vegetable oil (*dalda*)	Butter
Yeast	Dry yeast as it mixes faster when added through water		
Egg	Not applicable	Fresh eggs used (if required)	Fresh eggs used

Specification of flour for biscuits

The following table explains the composition of flour meant for biscuits.

Flour component	Composition
Moisture	1-5%
Cereal base	60%
Sugar	20% for hard dough, 35-40% for soft dough
Fat	16-20% for hard dough, 65-70% for soft dough
Protein	9.5%

Basic Ingredients and Formulation

Biscuits are a common bakery product which comprises primary ingredient flour and other ingredients.

For example: a formulation for baking 12kg biscuits is as follows.

Basic Ingredients	Quantity (weights)
Flour	10 kg
Yeast/baking Powder	25 g
Fat/Egg white	550 g
Sugar	1.5 kg
Milk (liquid or powder) / Water	1.5 kg /l
Flavourings	60 g

Fuels Used in the Baking Industry

At the end of the session, you will be able to:

- identify the various fuels used in the baking industry.

Fuel Types

Fuel being the largest contributor to the operating cost, careful selection of the right fuel is very important. Things to remember while choosing fuel are:

- An economically sound fuel
- Consistent flow/availability of fuel
- Waste produced i.e. type and quantity of ash that is formed
- Energy value of the fuel used
- Neighbourhood/bakery location for any smoke emission disturbances

Following is a list of fuels used in the baking industry:

Name of fuel	Use and properties
Gas fuel (LPG, CNG, biogas)	• Large scale commercial use • Burns clean without any contamination of products • Instant regulated heat
Electricity	• It is expensive • It is used mostly in large scale and medium scale industries
Solid fuel (Wood, charcoal, and coal)	Wood: • Cheap fuel • Used for small scale bakery • Causes smoke and contamination Coal: • It is dense and compact • Produces less ash • Used for small scale bakery Charcoal : • Produces less smoke and is dense • Used for small scale bakery
Liquid fuels (furnace oil or diesel)	• Used in medium or large industries as backup • It is expensive • Highly combustible in nature and has strong odour
Solar energy	• Used in large baking industries • Cost effective • Environment friendly • No storage space required for fuel

Production Processes

At the end of the session, you will be able to:

- state the various production processes followed in the baking industry.

Purpose of Baking

Baking is a crucial step to get the desired product. In the baking process, the dough undergoes physical and chemical changes. The purpose of baking can be stated as follows :

1. Physical changes: crust formation, oven spring formations takes place
2. Chemical changes: the blended effect of all the baking ingredients to give a quality product.

Control Points for Baking

While baking any product, the following points have to be noted. If these control points are not maintained, the product quality may be affected.

- Optimum temperature: 208^0 to 210^0F;
- Time: 25-30 minutes

Production Processes Used in the Baking Industry

In the baking industry, there are two ways to process baked products. They are: Continuous and Batch process. The following table explains these processes in detail.

Continuous	Batch
• A mechanical process which runs non-stop till the process is complete • An automatic machine is used • No manual labour involved • Proofing is done in a flow as a part of process • It saves labour cost • Machine controls are set only once at the start of the entire process • Biscuits, cookies, etc. are baked using this process	• A process which is done step wise • Semi-automatic machines used • Manual labour is involved • Proofing is done in groups of intervals • For each batch, machine setting is required • Bread, cake, etc. is baked using this process

Mixing Methods Used in the Baking Industry

At the end of the session, you will be able to:

- state the different mixing methods used in the baking industry.

Purpose of Mixing

The baking process for any baked good begins with mixing the dough. This stage determines the development of the dough and its temperature. If any of these variables are not met, it will have an effect on the quality of the final product. Hence, mixing is considered as the most important component of the baking process. The purpose of mixing can be stated as follows:

- to ensure uniform distribution of ingredients
- to ensure minimum loss of the leavening agent
- to hydrate dry ingredients
- to ensure perfect blending of ingredients
- to ensure prevention or development of gluten (depending upon the final product)

Control Points for Mixing

Mixing, being the most important stage of the baking process, having proper control over each of the components of the mixing process is extremely important. The following table explains the control points for mixing that one must pay attention to. Also mentioned in the table are the possible effects that may show up, if these control points are overlooked.

Control Point	Effect
1. Scaling	If the quantity of any of the ingredients is miscalculated, it will lead to faulty bread.
2. Mixing	If the dough is under mixed or over mixed, it will affect the handling properties of the dough.
3. Temperature	If the ideal temperature is not maintained, it will affect the rate of fermentation. This will, then, affect volume of the bread and the colour of the crust.
4. Time	If the mixing time is not maintained as per defined norms, it will affect the texture and the grain of the bread crumbs.
5. RPM of machine	If the RPM is not maintained, it will affect the dough quality and consequently, the quality of the final product.

Types of Mixing

Mixing is a crucial step as it gives uniformity to dough which enhances the taste of the end product. Hence, the method in which mixing is done is important for the end product. There are three different ways of mixing which are explained below in the chart:

Creaming mixing method	All-in-one mixing method	Fermented dough
• It is done in two or three stages • In the first stage, sugar and fats are mixed together. • In the second stage, chemicals are mixed followed by addition of salt and flour to the cream mixture. • This method helps in coarse, crumbly soft dough, ideal for biscuits.	• It is one stage mixing method. • Salt, leavening chemicals, colour, flavour, and milk powder are sieved in a tub with flour, sugar, etc. and mixed together with the aid of water to make satisfactory level of dough. • This is ideal for transfering dough into sheets for laminator process.	• All in one mixing and fermentation: All the ingredients including yeast mixed to form a dough that is allowed to ferment for 3 -8 hours • Further, the dough is developed for lamination/cutting process • Two stage mixing and fermentation: A sponge is made by mixing yeast water and flour and fermented for 15-20 hours. • Sponge textured dough is further mixed with remaining ingredients and kept for fermentation for 2-3 hours, which is later used for lamination, etc.

Proofing

At the end of the session, you will be able to:

- state the process of proofing.

What is Proofing

Proofing is the method of final dough rise using a leavening agent. Proofing is a part of the larger fermentation process.

Purpose of Proofing

Proofing is a crucial step that helps in achieving the desired volume as per the required product. The quantity of dough rises by 3-4 times during proofing. It is a period of continuous fermentation during resting of dough. The purpose of proofing is stated below:

1. To relax the dough from the stress received during previous operations.
2. To facilitate production of gas in order to give desired volume to the dough.
3. To mellow gluten to extensible character for oven rise.

Control Points for Proofing

While proofing, the following points have to be noted. If these control points are not maintained, then the product quality is affected.

- Optimum temperature: 95^0—98^0F
- Humidity: 80-85%
- Time: 55-65 minutes

Two stages of dough rising are:

Primary fermentation	Secondary fermentation
This is done right after the dough is mixed together and the size of the dough doubles.	This is final rising period which takes place before dough is shaped for bread.

Leavening agent/leavening is a substance that causes the dough/batter to rise. Yeast or baking soda is used as a leavening agent.

Working of leavening agent:

- In the presence of moisture, heat, and acidity the leavening agent reacts to produce carbon dioxide gas.
- This gas gets trapped as bubbles in the dough and helps to raise the dough making it lighter.
- When the risen dough/batter is baked, the bubbles set and the holes left by the gas bubbles remain.
- This gives the cake, bread, etc. the soft and spongy texture.

Test for proofing:

It is done with the help of poke method. In this method, a pointed stick is poked into the dough. When this is done, one of the following three conditions occurs:

Under proof	Over proof	Proofed
• The dough springs back after poking. • It is sent for proofing	• A tunnel is seen • It is set aside for combining with other dough	• The dough has risen as per desired level. • It is ready to bake

Methods of Dough Forming

At the end of the session, you will be able to:

- describe the methods of dough forming.

Dough Forming

The moulding of dough in various forms is known as dough forming. Dough forming is done after mixing the ingredients as per the finished product. This is done in three methods:

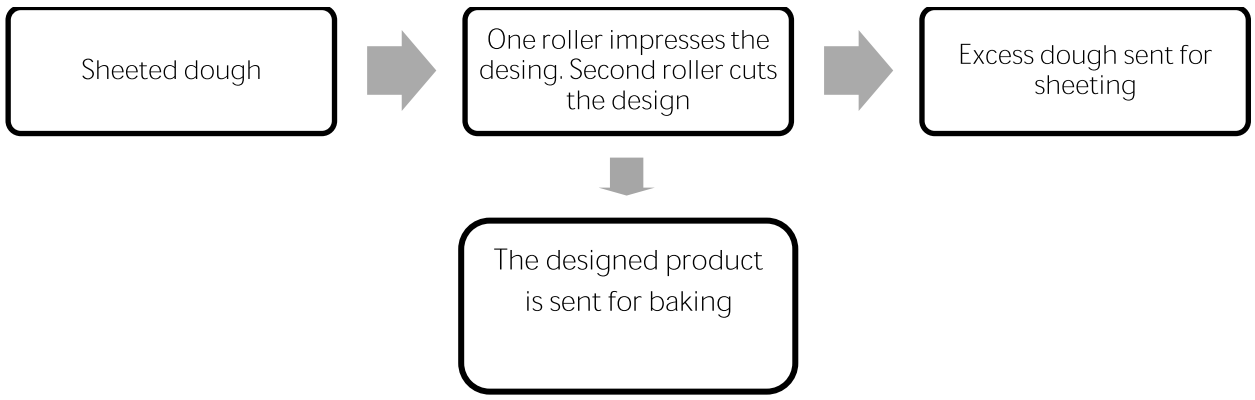
1. **Lamination:** Lamination is the process of alternating layers of dough and butter to make the biscuit crisper. There are three types of laminators: Horizontal, vertical, and stacked horizontal. The purpose of laminating can be stated by the following:

    - It is a method of repairing a poor dough sheet with pre-sheeter rolls.
    - The dough is folded at 90° angles to make it uniform in two directions.
    - Rolling and folding of the dough enhances the gluten, which makes the dough suitable for baking a desirable structure.
    - A layer of fat is inserted between layers of dough to give it a characteristic, flaky structure.

Lamination process is done in two different styles: folding and cut-and-lay

FOLDING	CUT-AND-LAY
• A THIN SHEET IS LAID BACKWARD AND FORWARD ON A CONVEYOR. • THE SHEETS ARE LAID IN A ZIGZAG PATTERN WITH ALTERNATE "TRIANGLES" OF THE UPPER AND LOWER SURFACES OF THE ORIGINAL SHEET.	• A sheet is cut into square pieces and it matches the width of the gauge roll to move forward continuously. • The cut pieces are laid on top of one another in succession behind the previous one.

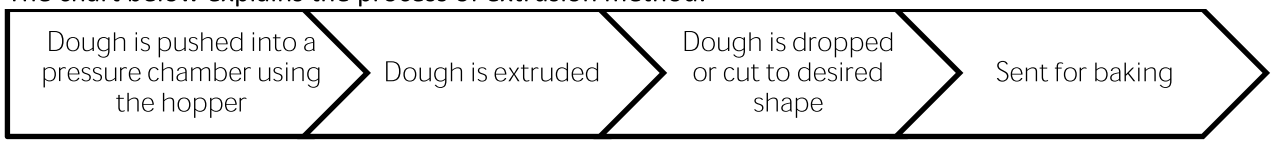
2. **Rotary Moulding:** In this method, soft dough is moulded**.** Uniform fermented/unfermented dough is sheeted through a set of roller which is further moulded by rotary moulding method. The chart given below explains the rotary moulding process of biscuits:



3. **Extrusion**: Extruder-dough formers are used when the dough is soft and evenly pourable. Products made from this method are irregularly shaped. The dough extrusion machine consists of a hopper. The hopper compresses the dough and pushes or drops it depending on the shape to be formed. The final product shape depends on two mechanism used for cutting or pressing. They are:

Wire cut	Rout press
• It is used for semi-liquid/vicious dough • The dough contains coarse particles in this process • Dough is dropped as chunks	• It is used for thinner liquidly dough • The dough is fine • Dough is poured as a ribbon.

The chart below explains the process of extrusion method:



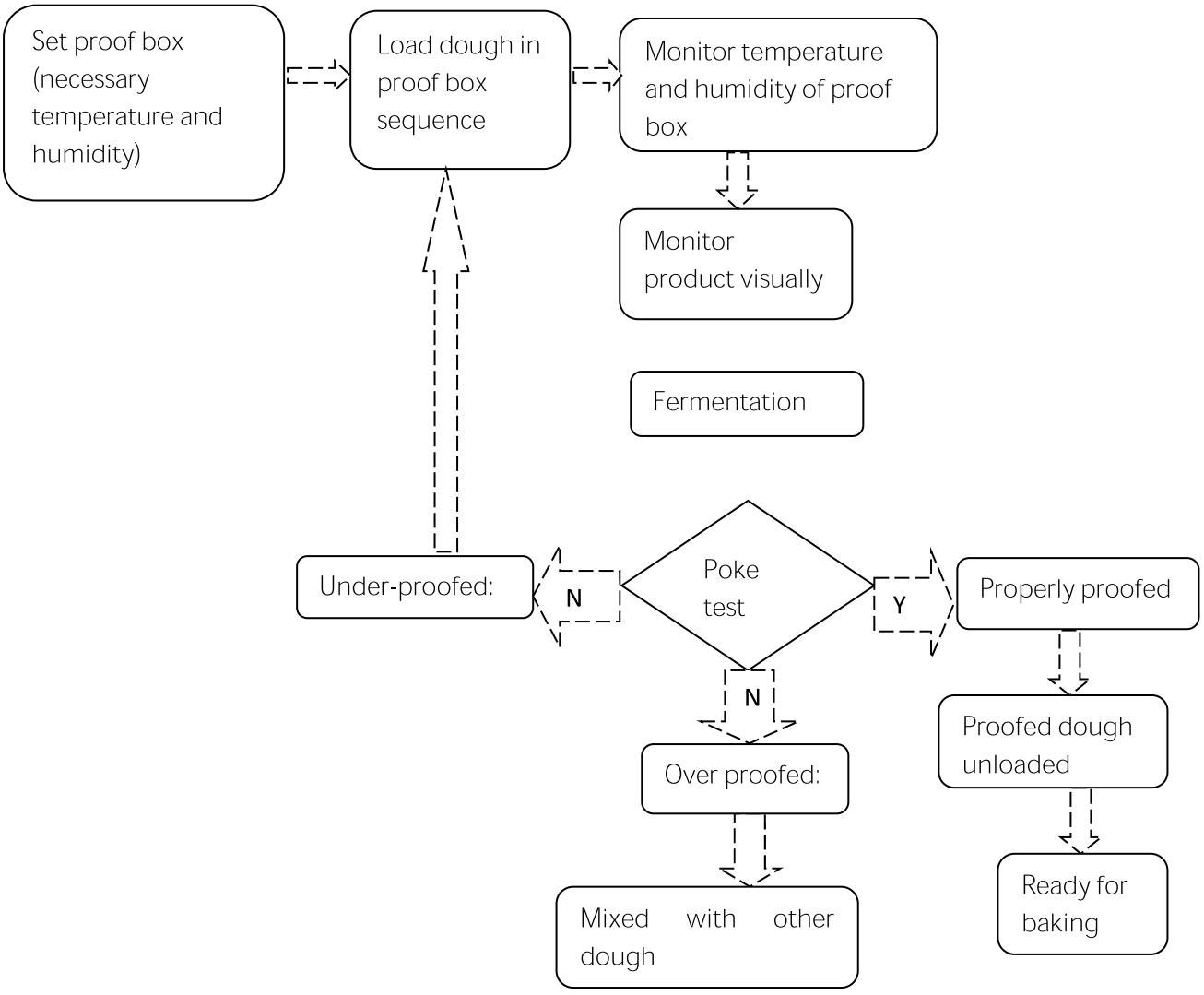
Execution of Baking Process

At the end of the session, you will be able to:

- state the process of proofing in the baking industry;
- state the process for baking plain biscuits in the oven;
- state the process of baking centre filled sandwich biscuits.

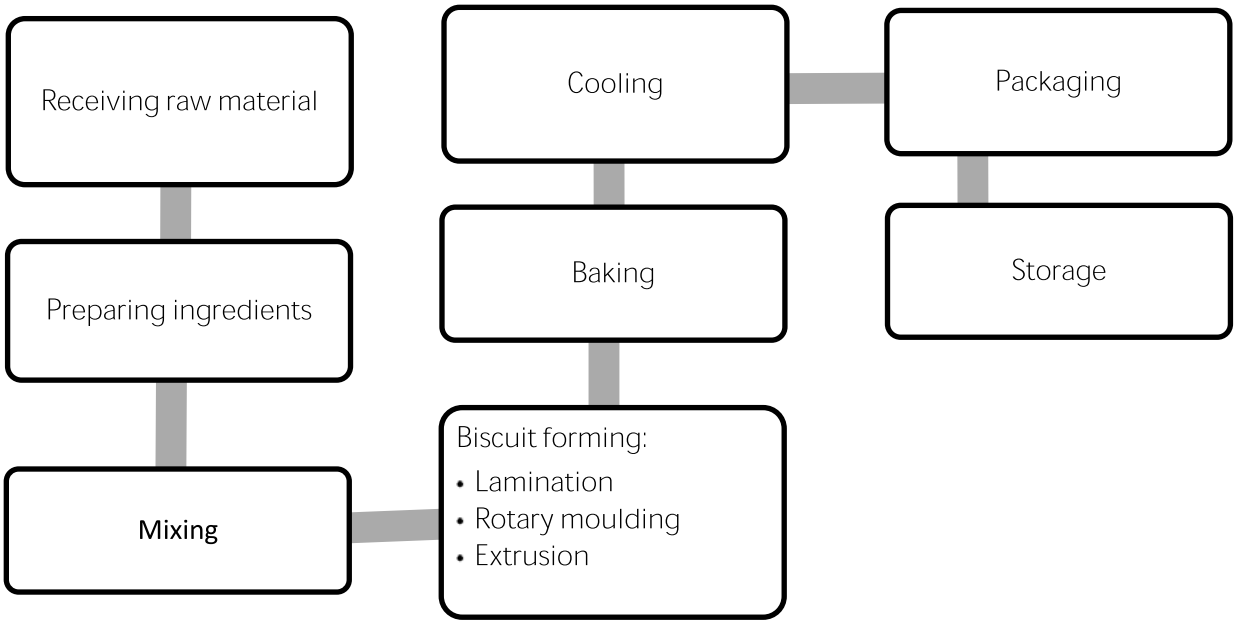
Process of Proofing

The process of proofing is explained in the chart below:



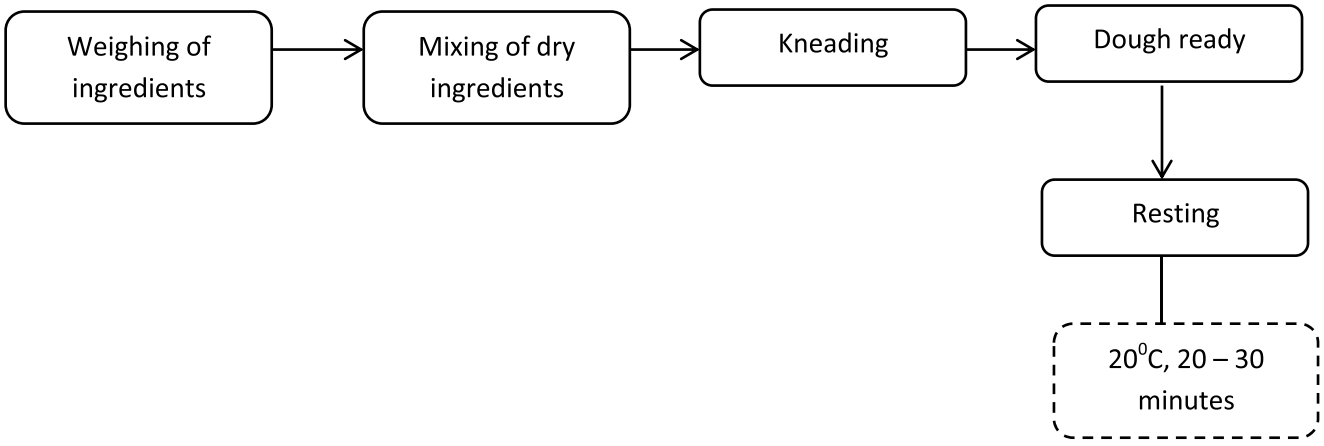
Biscuit Baking Process

The process of biscuit baking is explained in the chart below:

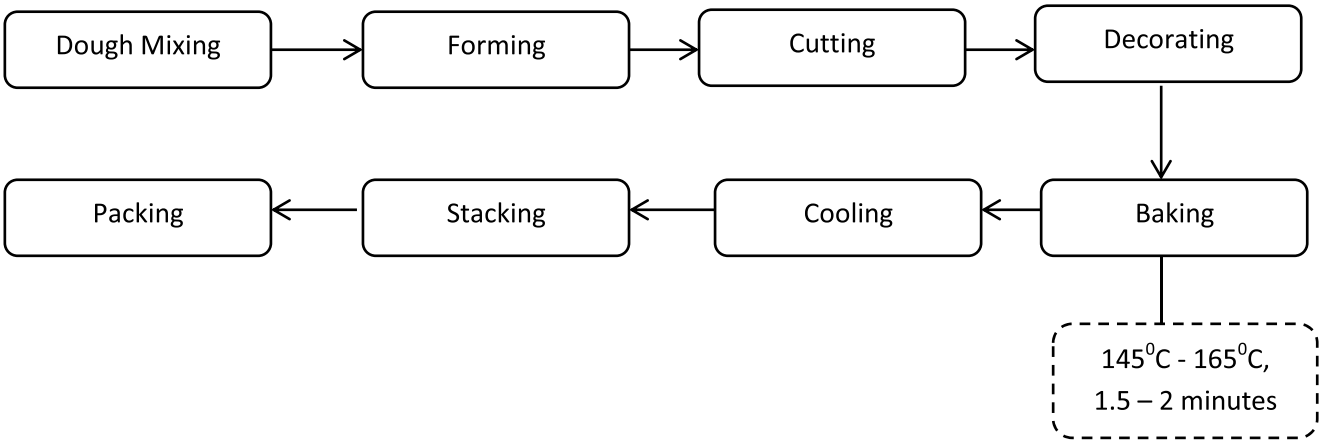


Biscuit Making Process for Soft Dough Biscuits, Hard Dough Biscuits and Crackers

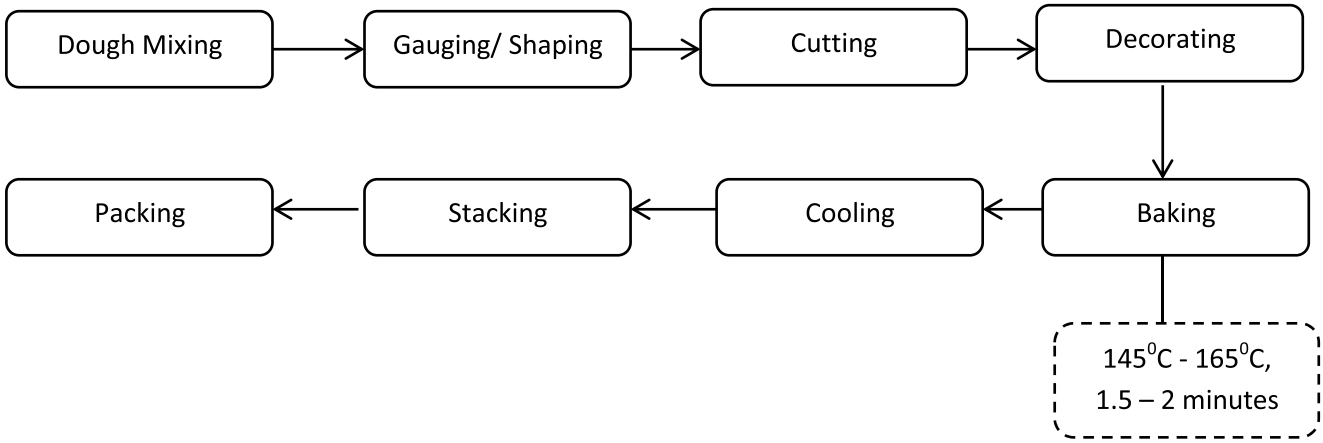
Dough Mixing – Process



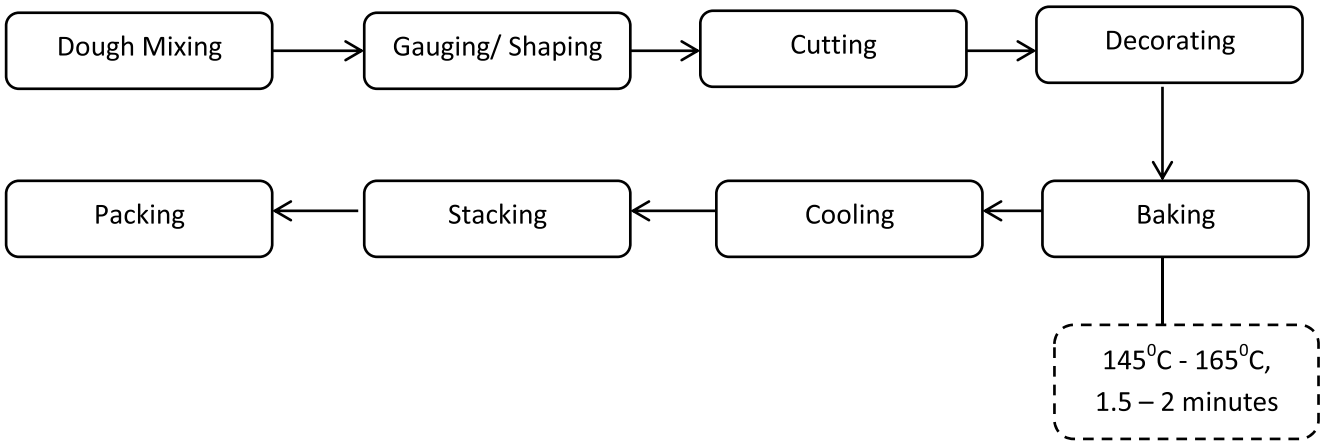
1. Soft Dough Biscuits



2. Hard Dough biscuits

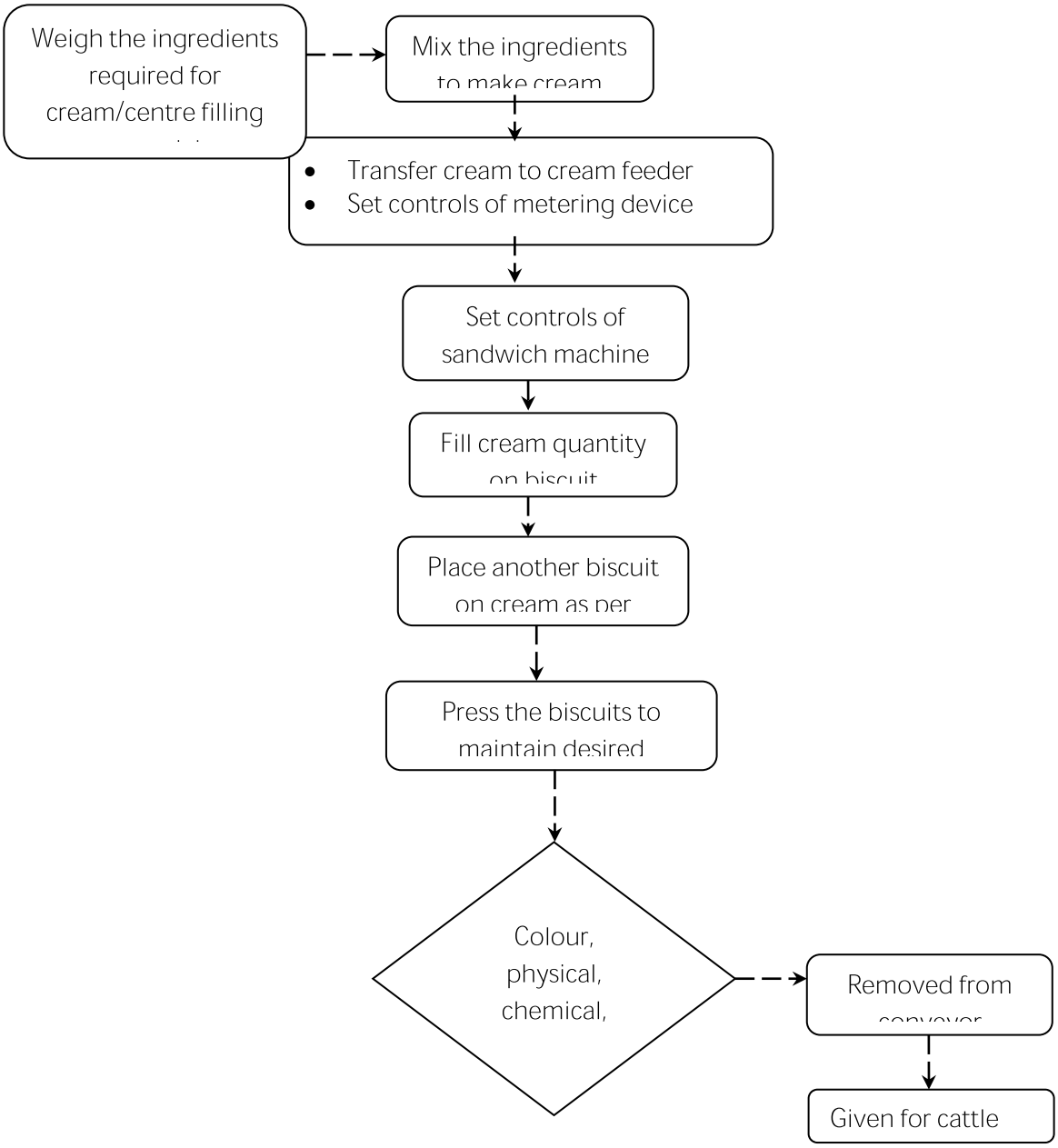


3. Hard Dough biscuits



Centre Filled Sandwich Biscuits

The mechanized process to make centre-filled sandwich biscuits is explained in the chart below



Control points:

Given below are control points for short dough, hard dough, crackers and laminated biscuits

Control points	Short dough	Strong dough	Crackers	Laminated
Temp of dough	210C	26-300C	30-38 0C	40-420C
Baking time	12 + min	15 min	3 min	5.5 min

Quality Check of Baked Product

At the end of the session, you will be able to:

- identify if the final product meets the quality parameters.

Parameters to Check the Baked Product

Once the product is baked, there are several specifications to check if it is as per organizational parameters. The following table illustrates this:

Way of testing	What to observe	How to do
Sensory	Colour	Observation
Physical	Appearance, texture and size	Observation
Organoleptic	Taste, flavour, mouth feel, rancid	By eating it

Faults and Remedies

The following table describes the various faults that may be found in final products and their causes.

Faults	Causes
Lack of volume	• Use of weak flour • Too much salt • Lack of Shortening • Yeast dissolved in hot water • Too much / not enough dough for mixer • Under mixing/ over mixing • Young/old dough • Too long proof/ insufficient proof • Excessive steam pressure in oven • Oven too hot
Too much volume	• Not enough salt • Use of wrong type of flour • Dough slightly overaged • Too much dough for pans • Over proofing • Cool oven
Crust colour too pale	• Too lean formula • Flour lacking diastatic activity • Excessive mineral yeast food • Old dough • Insufficient humidity in proof box • Cool oven • Under baking
Crust colour too dark	• Too much sugar

	• High milk content • Old dough • Oven too hot • Over baking
Blisters under the crust	• Young dough • Excessive steam in proof box • Over proofed • Rough handling at oven
Crust too thick	• Insufficient shortening • Low sugar content • Old dough • Lack of moisture in proof box • Excess steam in proof box • Cool oven • Over baking
Shell tops	• Green or new flour • Stiff dough • Dough too young • Lack of moisture in proof box • Not enough pan proof • Excessive top heat
Lack of break and shred	• Weak flour • Excessive amount of mineral yeast • Young dough • Extremely old dough • Excessive proof
Grey crumb	• Use of too much malt • Old dough • Excessive proofing • Pans too large for amount of dough
Streaked crumb	• Improper incorporation of ingredients • Sponge or dough crusted over during fermentation • Sponge not broken up properly • Excessive trough grease • Scrap dough picked up during make up • Excessive use of divider oil • Excessive dusting flour • Dough crusted during intermediate proof • To much machine punishment • Rough handling at oven
Coarse grain	• Weak flour • Improper mixing • Slack dough • Young dough • Old dough • Improper moulding • Excessive proof • Rough handling at oven • Cool oven

Poor Texture	• Weak flour • Lack of shortening • Improper mixing • Slack dough • Excessive trough grase • Young dough • Old dough • Excessive use of divider oil • Excessive dusting flour • Improper moulding • Cool oven
Poor flavour and taste	• Improper storage of ingredients • Poor quality ingredients • Off-flavoured ingredients • Improper amount of oil • Under fermented dough • Old dough • Unsanitary shop • Dirty pans • Under-baking • Over baking • Bread cooled under unsanitary conditions
Poor keeping qualities	• Too lean formula • Poor quality ingredients • Improper storage of ingredients • Old dough • Stiff dough • Over proofing • Cool oven • Bread cooled too long before wrapping
Holes in Bread	• Unbalanced formula • Flour too strong • Improper incorporation of ingredients • Under mixing • Over mixing • Excessive trough grease • Young dough • Old dough • Excessive use of divider oil • Excessive dusting flour • Too much machine punishment • Proof box too hot • Over proofing

In checking these faults, an analysis of the various causes will show

- inferior ingredients,
- unbalanced formula,
- improper mixing,
- incorrect fermentation time, and
- poor control of temperature, time and humidity throughout the production process,
- poor makeup procedures,
- poor oven conditions
- improper handling in cooling,
- wrapping and shipping account for most of bread faults

Cooling of Baked Products

At the end of the session, you will be able to:

- state the process of cooling baked products.

Cooling Baked Products

Baked products continue to lose moisture and starts setting as time passes. Hence, it is important to cool baked products in the right way. This ensures that baked products have a longer shelf life.

During the cooling process, the humidity of the cooling atmosphere must be controlled. There are two types of cooling systems that have to be followed. They are:

1. Atmospheric multi-tier conveyer cooling: The products from the oven band travel on a canvas web having single, double or three tiers. They are cooled slowly by the surrounding atmosphere.

2. Forced draft-cooling conveyer cooling: In this process, filtered air is blown against the direction of product coming out of the oven on the cooling conveyer. This ensures cooling of products faster than the atmospheric type.

Packaging of Baked Products

At the end of the session, you will be able to:

- state the process of packaging baked products.

Packaging Baked Products

The material used to contain, protect, and handle the delivery and preservation of finished goods from the manufacturer to the user is called packaging material. Materials used for packing baked products are selected if they:

- protect from foreign odour, contamination, heat, and moisture
- protect from mechanical damage
- help in easy handling of product
- are easy to carry
- increase or maintain product's shelf life
- follow legal compliance for values and ingredients for consumers

Packaging is basically categorized into:

Primary packaging	Secondary packaging
It is the packaging that comes in direct contact with the product.	It is the packaging that is used for transportation/warehouse storage/handling
Wax coated or laminated, bopp film paper is used	Cardboard boxes, CBB made of craft papers, tins are used often
E.g. Bread and bun packaging is generally made of a base coated paraffin wax.	E.g. Plastic crates that contain breads and buns

Apart from these, there are some more materials that are used for packaging. They are:

Material	Products
Flexible material (laminates)	Family packs of biscuits
Cardboard boxes	Cakes
Display boxes	Cookies, cakes, biscuits
Sachets or vertical pouches	Cookies and cakes
Polybags	Breads

Method Used for Packaging of Finished Goods

For packaging of finished baked products, a method called Modified Atmosphere Packaging (MAP) is used. The gases used in the method are carbon dioxide and nitrogen that increase the shelf life of the products.

Thermoforming	Pre-formed container mechanism	Horizontal or vertical form-fill-seal
• The packing material is drawn from the reel into a heating station to soften. • It is sent to forming station where it is moulded into a shape of the container with aid of vacuum and air pressure.	• An automatic tray sealer holds a tray/container held on conveyor chains throughout the length of the machine. • The product is loaded into a tray. • Then it is passed into a gas chamber together with the top lidding material where gas is flushed and the tray is sealed.	• A fully automated system and machines form their own flexible or semi-rigid containers from a base film in the forming station. • Heat softens the film before it is moulded in desired shape and size with the aid of vacuum. • The formed containers are loaded with the product. • Covering is done in the vacuum and gas chamber • Heat-sealed and sent for cutting, tamping, and labeling

Storage of Materials

At the end of the session, you will be able to:

- state the method of storing baking ingredients;
- state the method of storing finished products.

Storage of Baking ingredients

When storing baking ingredients, the baking industry follows some common methods. They are:

- Stock rotation methods like FIFO (First-In-First-Out) and FEFO (First-Expired-First-Out), especially for perishable baking ingredient, is used.
- Coolers are set at appropriate cooling temperatures (e.g. 41°F/5°C) for safety.
- Leftovers from a process are stored appropriately.
- Potentially hazardous items are thawed in the refrigerator, never at room temperature.
- Newly received baking ingredients are stored in the manufacturers' original packaging.
- Eggs and egg washes are never stored above baked products to avoid cross-contamination.
- Baking ingredients are stored at least 6 inches (15 cm) above the floor.
- All the bins containing ingredients are covered in order to protect them from rodents and pests.
- All baking ingredients stored are properly labelled.

Storage of Finished Products

When storing finished products, some common methods are followed. They are:

- Stock rotation methods like FIFO and FEFO is used to rotate finished products.
- Bakery items which may contain perishable ingredients like cream, cheese or eggs must be kept under refrigeration.
- Products that may have a longer shelf life can be stored at room temperature.
- All finished products are stored with labels of its ingredients and shelf life.

FIFO and FEFO methods of Storage:

FIFO	FEFO
• Abbreviation for First-In-First-Out • First received product leaves first from the store room/warehouse.	• Abbreviation for First-Expired-First-Out • Product, which has shortest shelf life, will leave first, irrespective of the order in which it comes in.

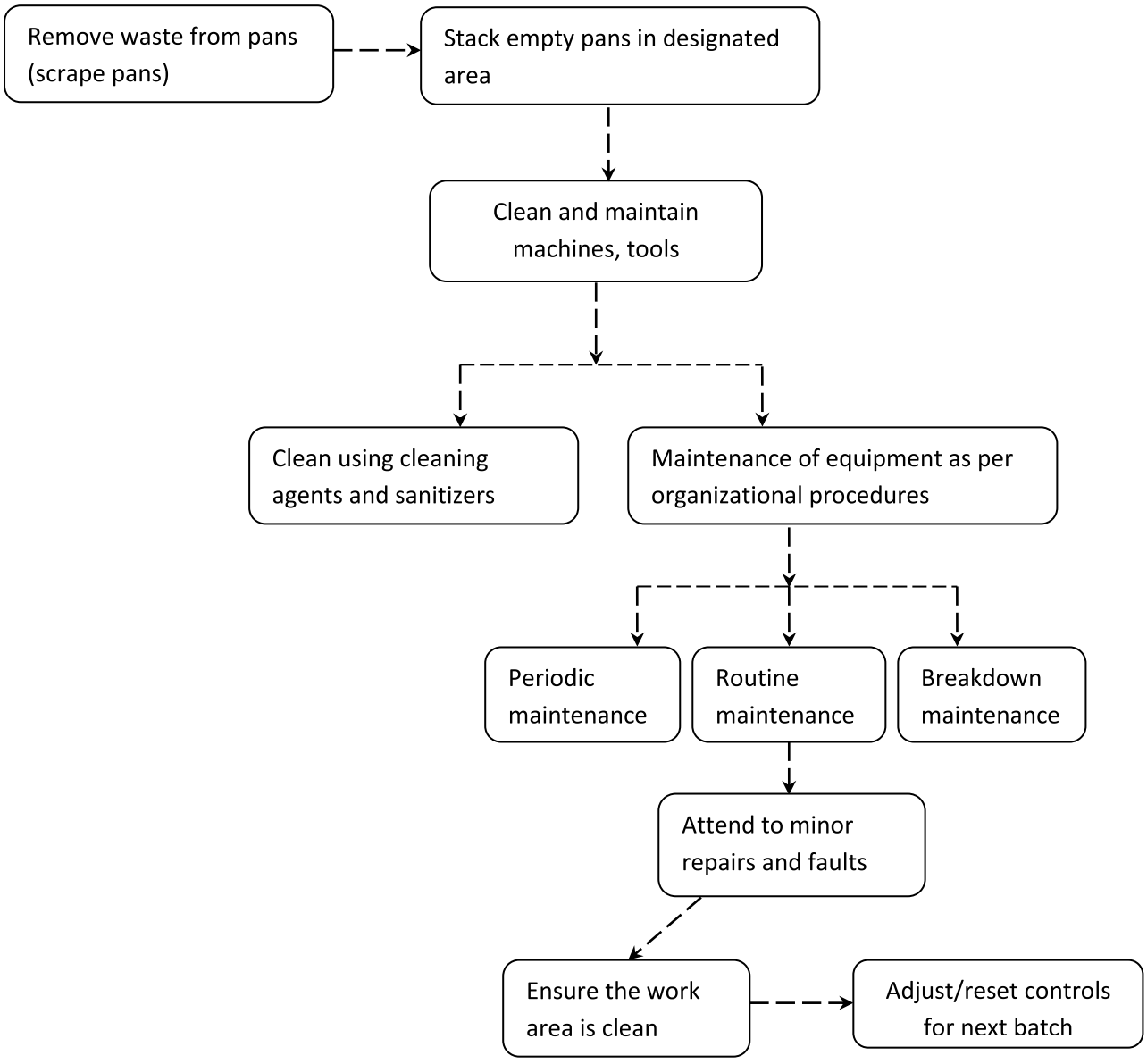
Post-Production Cleaning and Maintenance

At the end of the session, you will be able to:

- demonstrate the process of cleaning the work area and machineries after production.

Method of Post-Production Cleaning

The chart below shows how to clean and maintain the work area after production. The cleaning and maintaining process has been detailed inside the dotted box.



Types of Maintenance

After the production process is over, all food-handling equipment and tools are cleaned. Machineries are also checked for smooth and efficient functioning. The maintenance process of machineries can be classified as:

Routine maintenance	Periodic maintenance	Breakdown maintenance
It refers to checking and resolving any fault in the machinery after every batch production. It also includes regular maintenance and up-keep of the machine.	It refers to checking and resolving any fault in the machinery at scheduled intervals. These could be every day, week, month, and/or year.	It refers to checking and resolving any fault in the machinery if they breakdown.

Documentation

At the end of the session, you will be able to:

- state the need for documenting and maintaining records of baking ingredients, process, and finished products.

Need for Documentation

Every organization has to maintain records of baking ingredient procurement, production processes, and sales. This is to ensure that the business runs effectively and is profitable. Listed below are some reasons why there is a need for documentation:

- It gives detailed knowledge about running of the business.
- It helps to control product quality.
- It helps to keep track of the money invested in the business.
- It helps to identify the separate costs of baking ingredients.
- It helps to identify the production cost of a particular process.
- It helps to ensure that quality assurance procedures are followed.
- It helps to ensure that the production unit is running smoothly/effectively.
- It works as an evidence for legal procedures.
- It helps to set an appropriate product price.
- It helps to take corrective measures at the right time.

Record - Keeping

At the end of the session, you will be able to:

- state the method of documenting and recording the details of baking ingredients to final finished products.

How to Keep Records

Every food processing organization follows a more or less similar way of keeping records. Production records keep a log of:

- the quantity and type of ingredients used
- the processing conditions in which production took place (e.g. the temperature set or the air pressure applied)
- the product quality

Product quality can be maintained only when:

- The same quantity and quality of ingredients and baking ingredients are mixed in every batch
- A standard formulation is used for every batch
- Standard process parameters are applied for every batch

Every batch of food is given a batch number. This number is recorded in:

- stock control books (where baking ingredient procurement is noted)
- processing logbooks (where production process is noted)
- product sales records (where sales and distribution is noted)

The batch number must correlate with the product code number, which is printed on labels. This helps the processor to trace any fault found in a batch back to the baking ingredient used or the production process.

Example of a stock control book:

• **Product Name**			• **Batch Number**	
• **Baking ingredient***	• **Supplier**	• **Results of inspection for:**		
		A	**B**	**C**

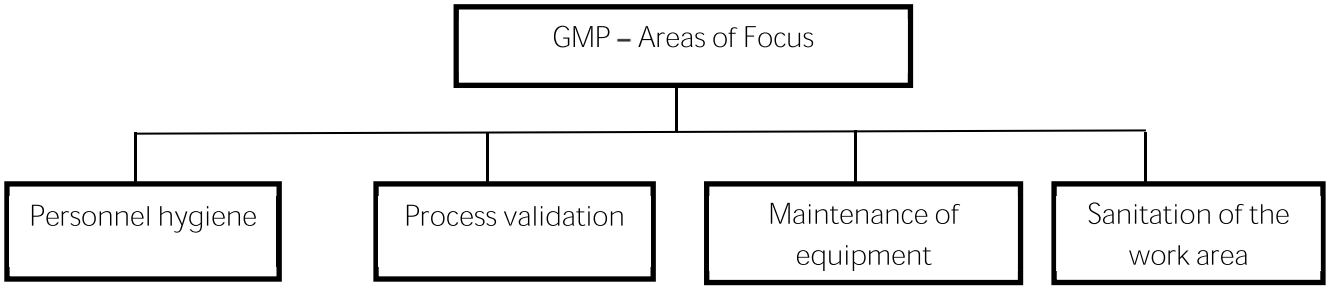
Good Manufacturing Practices (GMP)

At the end of the session, you will be able to:

- state the importance of safety, hygiene, and sanitation in the baking industry;
- follow the industry standards to maintain a safe and hygiene workplace.

Good Manufacturing Practices (GMP)

GMP is a set of guidelines proposed by the Food Safety Standards Authority of India (FSSAI) to ensure the production of high quality and safe processed foods. It requires a qualitative approach towards manufacturing to reduce chances of microbial contamination, spoilage, and errors.



Area of focus	GMP
Personnel hygiene	• Your organization follows strict hygiene and sanitation guidelines • You are provided training on Good Manufacturing Practices (GMP) • You are in sound health condition during working hours • You follow high standards of cleanliness • Your processing unit has enough facilities for toilets and wash stations
Sanitation of the work area	• The processing unit where you work is located in a clean, pollution-free area. • The entire processing unit is well ventilated and has adequate lighting. • The entire work area follows high standards of cleaning and sanitization. • There is a designated area for keeping utensils and equipment. It is kept clean and pest-free at all times.
Equipment maintenance	• The equipment used for processing foods is protected against contamination from lubricants, metal fragments, fuel, and contaminated water. • The cleaning and maintenance of tools, materials, and equipment is an easy process. • The organization follows a cleaning and sanitising drill as per daily, weekly, and monthly schedules.

Process validation	• All processes of production, like baking ingredient procurement, execution, storage, packaging, and logistics follow strict organizational parameters. • Quality checks are conducted at each step of production. This helps to ensure that food quality is maintained as per prescribed norms and standards. • The stock rotation of finished product follows the FEFO and FIFO methods. This is to ensure that there is a minimum chance of food spoilage. It will also help to retain the taste of processed foods.

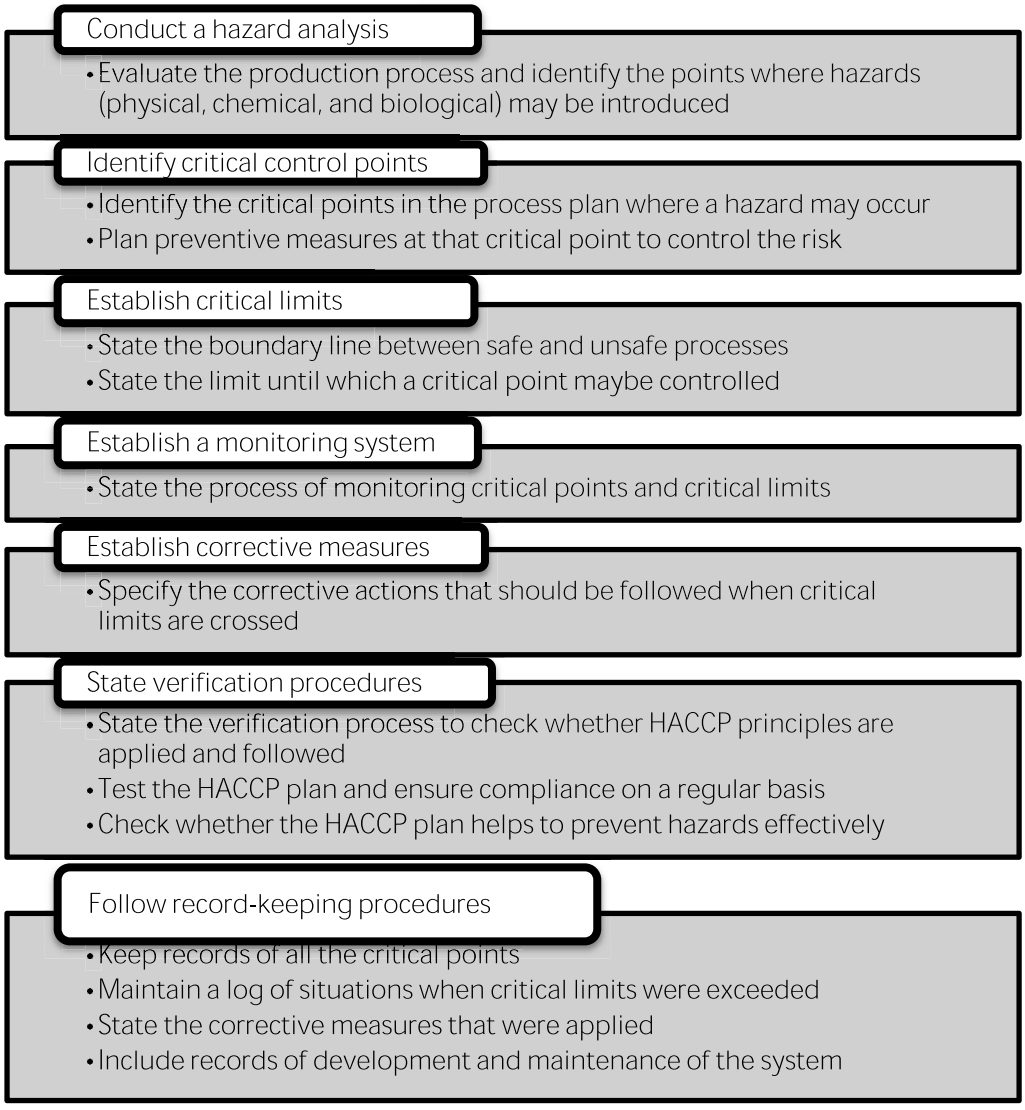
Hazard Analysis and Critical Control Point (HACCP)

At the end of the session, you will be able to:

- follow HACCP principles to eliminate food safety hazards in the process and products.

What is HACCP

Hazard Analysis and Critical Control Point (HACCP) is an international food safety regulation that is followed to reduce the risk of hazards in a food-processing unit. It is a system that identifies possible hazards and controls them at various points of the production process. The HACCP is based on seven principles. They are:



Example of an HACCP Plan

OPERATIONAL STEP	HAZARD	CONTROL MEASURE	CRITICAL LIMIT	MONITORING METHOD	CORRECTIVE ACTION	RESPONSIBILITY	RECORD
PROCURE-MENT OF BAKING INGREDIENTS	Physical (dirt, stone particles)	Supplier guarantee specifications established by quality assurance department	As per company internal specifications	Supplier guarantee certificate is visually confirmed	Reject materials if not accompanied by supplier guarantee	Store manager	Supplier guarantee
	Chemical (toxins, pesticides from baking ingredient)	Relative humidity of the store to be maintained					
	Microbiological (high microbiological load of baking ingredients, presence of pathogenic bacteria)	FIFO system should be established		Monitor temperature and humidity of storage			Store temperature logs

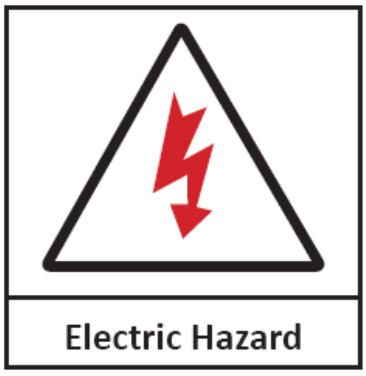
Safety Practices

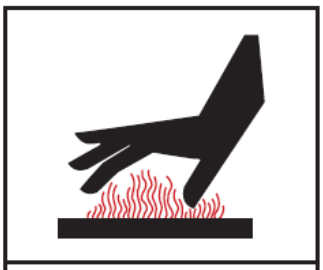
At the end of the session, you will be able to:

- follow safety practices in the work area.

Fire Safety Practices

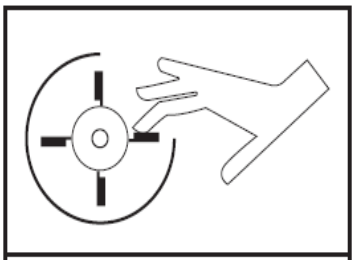
There are some symbols that you must know and understand to ensure safety in case of an emergency or fire. They are:





Hot Surface
Do Not Touch

Mind
Your Head

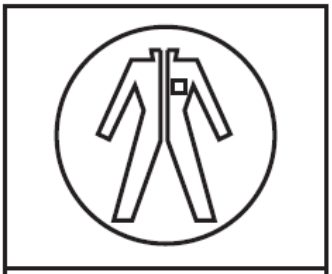


Never open the cover during the operation.

Use the Dustbin

Never Touch
Moving Part

Wear Eye
Protection



Wear Protective
Clothing

Warning
Slippery Floor

THIS IS A
TOBACCO FREE
WORKPLACE

Assembly Point

Emergency Measures

During an emergency, you must follow certain measures to tackle the situation in an organized manner. These measures are:

- Do not panic
- Respond to your senior immediately or escalate the matter to the concerned person
- Prepare against the emergency situation by keeping a fire bucket and a water source handy
- Evacuate the work area

After the emergency, you must:

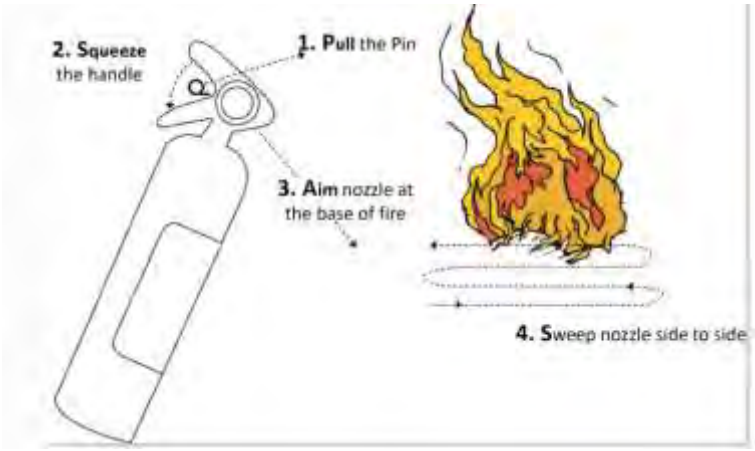
- Report the situation to a senior or the concerned authority
- Undertake recovery measures

Fire Safety Measures

Just like emergency measures, some common fire safety measures must be followed in case of fire. They are:

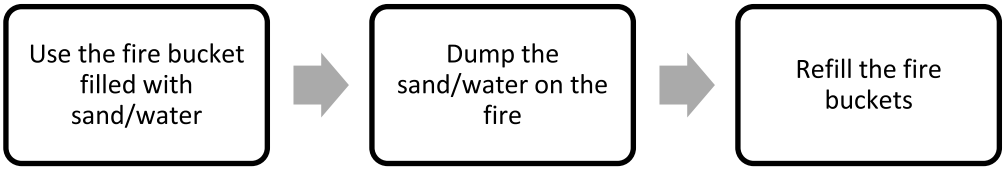
- Press the closest fire alarm button (if available)
- Call the fire brigade
- Assemble at the assembly point or designated area for safety
- Evacuate the building from the closest fire exit

Steps to Use the Fire Extinguisher



Fire extinguisher

Steps to Use the Fire Buckets



Fire bucket

SWOT Analysis

Strengths	Weaknesses
Opportunities	**Threats**

Field Visit

Field Observation Sheet					
#	Date of Visit	Name of the Industry and Location	Brief Description of the Industry Visited	Facilities Visited	Observations

List of Practicals

1. Equipment Used in the Baking Process
2. Prepare and Maintain Work Area
3. Prepare and Maintain Process Machineries and Tools
4. Plan Production Sequence
5. Proofing
6. Execution Process
7. Post-Production Cleaning and Maintenance

FIC/N5009 **Prepare and maintain work area and process machineries for producing bisuits in industrial units**

National Occupational Standard

Unit Code	FIC/N5009
Unit Title(Task)	**Prepare and maintain work area and process machineries for producing biscuits in industrial units**
Description	Preparing work area for hygiene and safety, and ensuring performance, efficiency and maintenance of process machineries and tools for producing biscuits in industrial units as per the specifications and standards of the organization.
Scope	This unit/task covers the following: • Prepare and maintain work area (for production of biscuits in industrial units) • Prepare and maintain process machineries and tools (for production of biscuits in industrial units)
Performance Criteria(PC) w.r.t. the Scope	
Element	**Performance Criteria**
Prepare and maintain work area (for production of biscuits in industrial units)	PC1. clean and maintain the cleanliness of the work area using approved sanitizers and keep it free from dust, waste, flies and pests PC2. ensure that the work area is safe and hygienic for food processing PC3. dispose waste materials as per defined SOP's and industry requirements
Prepare and maintain process machineries and tools (for production of biscuits in industrial units)	PC4. check the working and performance of all machineries and tools used for production such as proof box, oven, packaging machines, etc. PC5. clean the machineries and tools used with approved sanitizers following specifications and sops PC6. place the necessary tools required for the process PC7. attend minor repairs/ faults of machines, if required
Knowledge and Understanding (K)	
A. Organizational Context (Knowledge of the organization and its processes)	The user/individual on the job needs to know and understand: KA1. organization standards, process standards and procedures followed in the organization KA2. types of products produced by the organization KA3. code of business conduct KA4. dress code to be followed KA5. job responsibilities/duties and standard operating procedures KA6. internal processes such as procurement, store management, inventory management, quality management and key contact points for query resolution KA7. provision of wages, working hours as per organization policy KA8. food safety and hygiene standards followed
B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. types of chemicals, materials and equipment required for cleaning and maintenance KB2. cleaning process to disinfect equipment/ tools KB3. supplier/manufacturers instructions related to cleaning and maintenance KB4. knowledge on Food Safety Standards and Regulations (as per FSSAI) KB5. knowledge on legal regulations pertaining to work place such as health and safety, recommended dosage for use of sanitizers, control of substances hazardous to health, handling/storage/ disposal/ cautions for use of sanitizers

FIC/N5009 **Prepare and maintain work area and process machineries for producing bisuits in industrial units**

	and disinfectants, fire precautions/ occurrences, hygiene practice, disposal of waste, environmental protection, etc.
Skills (S)	
A. Core Skills/ Generic Skills	**Writing Skills**
	The user/ individual on the job needs to know and understand how to: SA1. note the information communicated by the supervisor SA2. note the raw materials used for production and the finished products produced SA3. note the readings of the process parameters and provide necessary information to fill the process chart SA4. note down observations (if any) related to the process SA5. write information documents to internal departments/ internal teams SA6. note down the data for ERP or as required by the organization
	Reading Skills
	The user/individual on the job needs to know and understand how to: SA7. read and interpret the process required for producing various types of products SA8. read and interpret and process flowchart for all products produced SA9. read equipment manuals and process documents to understand the equipment operation and process requirement SA10. read internal information documents sent by internal teams
	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to : SA11. discuss task lists, schedules and activities with the supervisor SA12. effectively communicate with the team members SA13. question the supervisor in order to understand the nature of the problem and to clarify queries SA14. attentively listen and comprehend the information given by the speaker SA15. communicate clearly with the supervisor and cross department team on the issues faced
B. Professional Skills	**Decision Making**
	The user/individual on the job needs to know and understand how to: SB1. analyse critical points in day to day tasks through experience and observation and identify control measures to solve the issue SB2. handle issues in case the supervisor is not available (as per the authority matrix defined by the organization)
	Plan and Organize
	The user/individual on the job needs to know and understand how to: SB3. plan and organize the work order and jobs received from the supervisor SB4. organize raw materials and packaging materials required for all products following the instruction provided by the supervisor SB5. plan and prioritize the work based on the instructions received from the supervisor SB6. plan to utilise time and equipment's effectively SB7. organize all process/ equipment manuals so as to access information easily SB8. support the supervisor in scheduling tasks for helper(s)

FIC/N5009 **Prepare and maintain work area and process machineries for producing bisuits in industrial units**

	Customer Centricity
	SB9. understand customer requirements and their priority and respond as per their needs
	Problem Solving
	The user/individual on the job needs to know and understand how to: SB10. support supervisor in solving problems by detailing out problems SB11. discuss the possible solutions with the supervisor for problem solving
	Analytical Thinking
	The user/individual on the job needs to know and understand how to: SB12. apply domain information about maintenance processes and technical knowledge about tools and equipment
	Critical Thinking
	The user/individual on the job needs to know and understand how to: SB13. use common sense and make judgments on day to day basis SB14. use reasoning skills to identify and resolve basic problems SB15. use intuition to detect any potential problems which could arise during operations SB16. use acquired knowledge of the process for identifying and handling issues

FIC/N5010 **Prepare for production of biscuits in industrial units**

National Occupational Standard

Unit Code	FIC/N5010
Unit Title(Task)	**Prepare for production of biscuits in industrial units**
Description	This unit is about preparation for production of biscuits in industrial units through planning of raw material and ingredients, machinery utilization and manpower requirement.
Scope	The scope of this role will include: • Plan for production (for biscuits in industrial units) • Plan equipment utilization and manpower (for production of biscuits in industrial units) • Organize and check equipments and raw material for carrying out production (for biscuits in industrial units)
Performance Criteria(PC) w.r.t. the Scope	
Element	**Performance Criteria**
Plan for production(for biscuits in industrial units)	PC1. read and understand the production order from the supervisor PC2. check the availability of raw materials and ingredients such as flour, sugar, shortenings, additives, preservatives, etc., packaging materials, working of machineries and availability of manpower PC3. calculate total weight of dough required for order quantity (considering process loss) PC4. plan production sequence by: • grouping similar type of products (hard and soft biscuits) • grouping similar type of dough (hard and soft dough) • grouping products that require similar process and process parameters • grouping products that require same processing machineries • planning maximum capacity utilization of machineries • avoiding clean-in-place (CIP) after each type of product • planning efficient utilization of resources/manpower • prioritizing urgent orders
Plan equipment utilization and manpower (for production of biscuits in industrial units)	PC5. ensure the working and performance of each equipment required for the process PC6. calculate the process time for each batch for effective utilization of machineries PC7. plan batch size considering full capacity utilization of machineries PC8. allot responsibilities/ work to the assistants and helpers
Organize and check equipments and raw material for carrying out production (for biscuits in industrial units)	PC9. refer to the process chart/ product flow chart/formulation chart for product(s) produced PC10. weigh the raw materials and ingredients required for the batch PC11. check the conformance of raw material quality to organization standards by verifying the quality analysis report from the supplier/ internal lab and by checking the physical parameters like appearance, colour, aroma, texture etc.

	PC12. organize the equipments as per the process requirement PC13. change dies, moulds, etc. and other parts of machineries to prepare for production PC14. start machine and check the working and performance of the machine PC15. make minor adjustments or repairs (if required) PC16. keep the tools accessible to attend repairs/faults in case of breakdown
Knowledge and Understanding (K)	
B. Organizational Context (Knowledge of the organization and its processes)	The user/individual on the job needs to know and understand: KA1. organization standards, process standards and procedures followed in the organization KA2. types of products produced by the organization KA3. code of business conduct KA4. dress code to be followed KA5. job responsibilities/duties and standard operating procedures KA6. internal processes such as procurement, store management, inventory management, quality management and key contact points for query resolution KA7. provision of wages, working hours as per organization policy KA8. food safety and hygiene standards followed
B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. types of raw materials, ingredients used in bakery KB2. types of raw materials, ingredients, additives, etc. used for production of various types of biscuits KB3. types of dough for making biscuits KB4. methods for preparing various types of dough for biscuit making KB5. process and process parameters for baking various types of biscuits KB6. varieties of biscuits obtained from each type of dough KB7. types of machineries used for making biscuits KB8. types of machineries used in the baking units and machineries used in the organization KB9. maintenance of baking equipments KB10. supplier/manufacturer's instructions for all baking machineries and equipments KB11. basic mathematics to calculate raw material required for obtaining specified quantity of finished product KB12. quality parameters and quality assessment based on physical parameters KB13. food safety and hygiene KB14. good manufacturing practice (GMP) KB15. hazard analysis and critical control point (HACCP)
Skills (S)	
Core Skills/ Generic Skills	**Writing Skills** The user/ individual on the job needs to know and understand how to: SA1. note the information communicated by the supervisor SA2. note the raw materials used for production and the finished products produced SA3. note the readings of the process parameters and provide necessary information to fill the process chart

	SA4. note down observations (if any) related to the process SA5. write information documents to internal departments/ internal teams SA6. note down the data for ERP or as required by the organization
	Reading Skills
	The user/individual on the job needs to know and understand how to: SA7. read and interpret the process required for producing various types of products SA8. read and interpret and process flowchart for all products produced SA9. read equipment manuals and process documents to understand the equipment operation and process requirement SA10. read internal information documents sent by internal teams
	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to : SA11. discuss task lists, schedules and activities with the supervisor SA12. effectively communicate with the team members SA13. question the supervisor in order to understand the nature of the problem and to clarify queries SA14. attentively listen and comprehend the information given by the speaker SA15. communicate clearly with the supervisor and cross department team on the issues faced
B. Professional Skills	**Decision Making**
	The user/individual on the job needs to know and understand how to: SB1. analyse critical points in day to day tasks through experience and observation and identify control measures to solve the issue SB2. handle issues in case the supervisor is not available (as per the authority matrix defined by the organization)
	Plan and Organize
	The user/individual on the job needs to know and understand how to: SB3. plan and organize the work order and jobs received from the supervisor SB4. organize raw materials and packaging materials required for all products following the instruction provided by the supervisor SB5. plan and prioritize the work based on the instructions received from the supervisor SB6. plan to utilise time and equipment's effectively SB7. organize all process/ equipment manuals so as to access information easily SB8. support the supervisor in scheduling tasks for helper(s)
	Customer Centricity
	SB9. understand customer requirements and their priority and respond as per their needs
	Problem Solving
	The user/individual on the job needs to know and understand how to: SB10. support supervisor in solving problems by detailing out problems SB11. discuss the possible solutions with the supervisor for problem solving
	Analytical Thinking
	The user/individual on the job needs to know and understand how to: SB12. apply domain information about maintenance processes and technical

	knowledge about tools and equipment
	Critical Thinking
	The user/individual on the job needs to know and understand how to: SB13. use common sense and make judgments on day to day basis SB14. use reasoning skills to identify and resolve basic problems SB15. use intuition to detect any potential problems which could arise during operations SB16. use acquired knowledge of the process for identifying and handling issues

FIC/N5011 **Produce biscuits in industrial units**

National Occupational Standard

Unit Code	**FIC/N5011**
Unit Title(Task)	**Produce biscuits in industrial units**
Description	This OS unit is about producing biscuits in industrial units as per the defined SOPs of the organization.
Scope	The scope of this role will include: • Organize raw materials • Mix Ingredients • Laminate and mould dough • Bake biscuits • Prepare centre filled/sandwich biscuits • Post process cleaning and regular maintenance of equipments
Performance Criteria(PC) w.r.t. the Scope	
Element	**Performance Criteria**
Organize raw materials	PC1. refer to the work order and formulation and organize all the ingredients required for the order PC2. check the quality of each ingredient through physical parameters such as appearance, colour, odour, texture, etc. for its conformance to organization standards PC3. weigh and measure all ingredients such as flour, fat, water, sugar, additives, flavours, spices, etc. required for product/batch and sift the ingredients manually (in manually operated unit) PC4. set and control metering devices that weigh, measure, sift, and convey each approved ingredients into the mixing machine for each ingredients such as flour, fat, water, sugar, additives, approved flavours and colours spices etc required for the product (in mechanized unit) PC5. check the scale indicators to confirm if specified amount of ingredients have been added
Mix Ingredients	PC6. mix all the ingredients manually to desired consistency PC7. transfer all the ingredients together or sequentially into the mixer depending on the method followed by the organization PC8. set the mixer speed, time and temperature depending on the mixing processes followed by the organization and start the mixer to mix and knead the ingredients to make hard/ soft dough for biscuits PC9. control the mixing time and mixing temperature which are critical for making hard/soft dough for biscuits PC10. check the dough consistency periodically until achieving dough of desired consistency PC11. ferment the dough, if required
Laminate and mould dough	PC12. feed the hard dough into the layering or forming machines or dough feeder as required PC13. ensure the correct forming and moulding of the dough PC14. set the controls of each sheeting roller of the laminator machine to produce continuous sheet of hard dough as per specifications and standards (for hard dough) PC15. set the required moulding roller/ cutter/ die

	PC16. set the controls of rotary cutter machine to cut the sheet of hard dough to desired size, shape and design as per specifications and standards of the organization PC17. set the controls of the conveyors to separate the cut hard dough and control scrap return PC18. control operation of the sprinkler PC19. set the controls of rotary cutter machine and start machine to mould soft dough to desired size, shape, weight and thickness as per specifications and standards of the organization (for soft dough) PC20. ensure correct transfer of dough pieces to the oven band
Bake biscuits	PC21. pre-heat the oven and set the oven parameters such as baking temperature and baking time (batch process), load the filled pans /moulds in the oven and bake the dough monitoring oven parameters during baking process PC22. set and maintain the speed of the panning conveyor to control the shaped/moulded dough entering the tunnel oven (continuous process) PC23. set the oven parameters such as temperature, time, conveyor speed, etc. and monitor the oven parameters during baking process PC24. observe baking of biscuits through the observation window of the tunnel oven PC25. observe quality of baked biscuit coming out of oven through parameters such as color, aroma, texture, etc. to detect over baking /under baking and control oven parameters to achieve finished product of uniform quality PC26. remove non-conforming products from the conveyor PC27. check the quality of the finished products through physical parameters such as colour, size, appearance, texture, aroma, taste, etc. and compare against standard PC28. set, control and maintain speed of the cooling conveyor to cool the biscuit
Prepare centre filled/sandwich biscuits	PC29. weigh the ingredients such as fat, sugar, chocolate, flavour, etc. required for preparing the cream/centre filling material for soft dough biscuits PC30. transfer the ingredients into the mixer, set and adjust controls and start mixer to mix cream ingredients PC31. transfer cream into the cream feed and set controls of metering devices of cream feed on the sandwiching machine PC32. set controls of the sandwiching machine to fill measured quantity of cream on soft dough biscuit, position and place another soft dough biscuit over cream filled biscuit, press the biscuits and maintain the thickness of the cream biscuit PC33. check the quality of the finished products through physical parameters such as colour, size, appearance, texture, aroma, taste etc. and compare against standard PC34. remove non-conforming products from the conveyor PC35. report discrepancies/concerns in each stage of production to department supervisor for immediate action

Post process cleaning and regular maintenance of equipments	PC36. clean the work area, machineries, equipment and tools using recommended cleaning agents and sanitizers PC37. attend minor repairs/faults of all machines (if any) PC38. ensure periodic (daily/weekly/monthly/quarterly/half yearly/annual) maintenance of all machines and equipment following the SOP or following suppliers instructions/manuals
Knowledge and Understanding (K)	
C. Organizational Context (Knowledge of the organization and its processes)	The user/individual on the job needs to know and understand: KA1. organization standards, process standards and procedures followed in the organization KA2. types of products produced by the organization KA3. code of business conduct KA4. dress code to be followed KA5. job responsibilities/duties and standard operating procedures KA6. internal processes such as procurement, store management, inventory management, quality management and key contact points for query resolution KA7. provision of wages, working hours as per organization policy KA8. food safety and hygiene standards followed
B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. types of raw materials, ingredients used in bakery KB2. types of raw materials, ingredients, additives etc used for production of various types of biscuits KB3. types of dough in bakery for preparing various types of biscuits KB4. methods for preparing various types of dough KB5. process parameters to prepare various types of dough KB6. types of ingredients required for preparing different type of dough KB7. types of biscuit products obtained from each type of dough KB8. process and process parameters for preparing various types of biscuits KB9. types of machineries used for making dough and in the baking process KB10. types of machineries used in the baking units and machineries used in the organization KB11. maintenance of baking equipments KB12. supplier/manufacturer's instructions for all baking machineries and equipments KB13. basic mathematics to calculate raw material required for obtaining specified quantity of finished product KB14. quality parameters and quality assessment based on physical parameters KB15. food safety and hygiene KB16. good manufacturing practice (gmp) KB17. hazard analysis and critical control point (haccp)
Skills (S)	
B. Core Skills/ Generic Skills	**Writing Skills**
	The user/ individual on the job needs to know and understand how to: SA1. note the information communicated by the supervisor SA2. note the raw materials used for production and the finished products produced

	SA3. note the readings of the process parameters and provide necessary information to fill the process chart SA4. note down observations (if any) related to the process SA5. write information documents to internal departments/ internal teams SA6. note down the data for ERP or as required by the organization
	Reading Skills
	The user/individual on the job needs to know and understand how to: SA7. read and interpret the process required for producing various types of products SA8. read and interpret and process flowchart for all products produced SA9. read equipment manuals and process documents to understand the equipment operation and process requirement SA10. read internal information documents sent by internal teams
	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to : SA11. discuss task lists, schedules and activities with the supervisor SA12. effectively communicate with the team members SA13. question the supervisor in order to understand the nature of the problem and to clarify queries SA14. attentively listen and comprehend the information given by the speaker SA15. communicate clearly with the supervisor and cross department team on the issues faced
B. Professional Skills	**Decision Making**
	The user/individual on the job needs to know and understand how to: SB1. analyse critical points in day to day tasks through experience and observation and identify control measures to solve the issue SB2. handle issues in case the supervisor is not available (as per the authority matrix defined by the organization)
	Plan and Organize
	The user/individual on the job needs to know and understand how to: SB3. plan and organize the work order and jobs received from the supervisor SB4. organize raw materials and packaging materials required for all products following the instruction provided by the supervisor SB5. plan and prioritize the work based on the instructions received from the supervisor SB6. plan to utilise time and equipment's effectively SB7. organize all process/ equipment manuals so as to access information easily SB8. support the supervisor in scheduling tasks for helper(s)
	Customer Centricity
	The user/individual on the job needs to know and understand how to: SB9. understand customer requirements and their priority and respond as per their needs
	Problem Solving
	The user/individual on the job needs to know and understand how to: SB10. support supervisor in solving problems by detailing out problems SB11. discuss the possible solutions with the supervisor for problem solving
	Analytical Thinking
	The user/individual on the job needs to know and understand how to:

FIC/N5011 **Produce biscuits in industrial units**

	SB12. apply domain information about maintenance processes and technical knowledge about tools and equipment
	Critical Thinking
	The user/individual on the job needs to know and understand how to: SB13. use common sense and make judgments on day to day basis SB14. use reasoning skills to identify and resolve basic problems SB15. use intuition to detect any potential problems which could arise during operations SB16. use acquired knowledge of the process for identifying and handling issues

FIC/N5012 **Complete documentation and record keeping related to production of biscuits in industrial units**

National Occupational Standard

Unit Code	FIC/N5012
Unit Title(Task)	**Complete documentation and record keeping related to production of biscuits in industrial units**
Description	This OS unit is about documenting and maintaining records of raw materials, process and finished products related to production of biscuits in industrial units.
Scope	This unit/task covers the following: • Document and maintain record of raw material (for production of biscuits in industrial units) • Document and maintain record of production schedule and process parameters (for production of biscuits in industrial units) • Document and maintain record of finished products (for production of biscuits in industrial units)

Performance Criteria(PC) w.r.t. the Scope	
Element	**Performance Criteria**
Document and maintain record of raw material (for production of biscuits in industrial units)	PC1. document and maintain record of all raw materials used for making biscuits such as name of raw materials, supplier details, batch number, receiving date/ date of manufacture, expiry date, supplier quality document, quality parameters of all raw materials, internal quality analysis report, etc. as per organziational standards PC2. maintain record of observations (if any) related to raw materials PC3. load the raw materials details in ERP for future reference PC4. verify the documents and track from finished product to raw materials, in case of quality concerns and during quality management system audit
Document and maintain record of production schedule and process parameters (for production of biscuits in industrial units)	PC5. document and maintain record of production details such as the product produced, production sequence, equipments and machinery details, efficiency and capacity utilization of equipment PC6. document and maintain record of process details such as type of raw material used, type of dough, process parameters (temperature, time, etc.) for entire process in process chart or production log for all products produced PC7. document and maintain record of batch size, raw material used, yield after each stage of process, wastage, energy utilization and final products produced PC8. maintain record of observations (if any) or deviations related to production and process parameters PC9. load the production plan and process details in ERP for future reference PC10. verify documents and track from finished product to ingredients, in case of quality concerns and for quality management system audits
Document and maintain record of finished products (for production of biscuits in industrial units)	PC11. document and maintain record of finished products details such as type of products produced, quantity produced per batch, quantity produced in each type of product, batch number, time of packing, date of manufacture, date of expiry, other label details, primary ,secondary and tertiary packaging materials for all finished products, storage conditions, etc. as per organizational standards PC12. maintain record of observations or deviations (if any) related to finished

FIC/N5012 **Complete documentation and record keeping related to production of biscuits in industrial units**

	products PC13. load the details of finished products in ERP for future reference PC14. verify the documents and track from finished product to raw materials, in case of quality concerns and for quality management system audits
Knowledge and Understanding (K)	
D. Organizational Context (Knowledge of the organization and its processes)	The user/individual on the job needs to know and understand: KA1. organization standards, process standards and procedures followed in the organization KA2. types of products produced by the organization KA3. code of business conduct KA4. dress code to be followed KA5. job responsibilities/duties and standard operating procedures KA6. internal processes such as procurement, store management, inventory management, quality management and key contact points for query resolution KA7. provision of wages, working hours as per organization policy KA8. food safety and hygiene standards followed
B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. documentation system followed in the organization such as production chart, process chart and finished products chart KB2. details of raw materials and finished products to be recorded KB3. details of production and process parameters to be recorded and maintained KB4. methods to document and maintain records of observations (if any) related to raw materials, process and finished products KB5. methods to track back the record from finished product to raw material KB6. basic computer knowledge KB7. entering the details in erp system followed by the organization
Skills (S)	
C. Core Skills/ Generic Skills	**Writing Skills** The user/ individual on the job needs to know and understand how to: SA1. note the information communicated by the supervisor SA2. note the raw materials used for production and the finished products produced SA3. note the readings of the process parameters and provide necessary information to fill the process chart SA4. note down observations (if any) related to the process SA5. write information documents to internal departments/ internal teams SA6. note down the data for ERP or as required by the organization
	Reading Skills The user/individual on the job needs to know and understand how to: SA7. read and interpret the process required for producing various types of products SA8. read and interpret and process flowchart for all products produced SA9. read equipment manuals and process documents to understand the equipment operation and process requirement SA10. read internal information documents sent by internal teams

FIC/N5012 **Complete documentation and record keeping related to production of biscuits in industrial units**

	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to : SA11. discuss task lists, schedules and activities with the supervisor SA12. effectively communicate with the team members SA13. question the supervisor in order to understand the nature of the problem and to clarify queries SA14. attentively listen and comprehend the information given by the speaker SA15. communicate clearly with the supervisor and cross department team on the issues faced
B. Professional Skills	**Decision Making**
	The user/individual on the job needs to know and understand how to: SB1. analyse critical points in day to day tasks through experience and observation and identify control measures to solve the issue SB2. handle issues in case the supervisor is not available (as per the authority matrix defined by the organization)
	Plan and Organize
	The user/individual on the job needs to know and understand how to: SB3. plan and organize the work order and jobs received from the supervisor SB4. organize raw materials and packaging materials required for all products following the instruction provided by the supervisor SB5. plan and prioritize the work based on the instructions received from the supervisor SB6. plan to utilise time and equipment's effectively SB7. organize all process/ equipment manuals so as to access information easily SB8. support the supervisor in scheduling tasks for helper(s)
	Customer Centricity
	The user/individual on the job needs to know and understand how to: SB9. understand customer requirements and their priority and respond as per their needs
	Problem Solving
	The user/individual on the job needs to know and understand how to: SB10. support supervisor in solving problems by detailing out problems SB11. discuss the possible solutions with the supervisor for problem solving
	Analytical Thinking
	The user/individual on the job needs to know and understand how to: SB12. apply domain information about maintenance processes and technical knowledge about tools and equipment
	Critical Thinking
	The user/individual on the job needs to know and understand how to: SB13. use common sense and make judgments on day to day basis SB14. use reasoning skills to identify and resolve basic problems SB15. use intuition to detect any potential problems which could arise during operations SB16. use acquired knowledge of the process for identifying and handling issues

FIC/N9001 **Food safety, hygiene and sanitation for processing food products**

National Occupational Standard

Unit Code	**FIC/N9001**
Unit Title(Task)	**Food safety, hygiene and sanitation for processing food products**
Description	This OS unit is about maintaining food safety, hygiene and sanitation in work area and processing unit for processing food products
Scope	The scope of this role will include: • Perform safety and sanitation related functions (for processing food products) • Apply food safety practices (for processing food products)
Performance Criteria(PC) w.r.t. the Scope	
Element	**Performance Criteria**
Perform safety and sanitation related functions (for processing food products)	PC1. comply with food safety and hygiene procedures followed in the organization PC2. ensure personal hygiene by using of gloves, hairnets, masks, ear plugs, goggles, shoes, etc. PC3. ensure hygienic production of food by inspecting raw materials, ingredients, finished products, etc. for compliance to physical, chemical and microbiological parameters PC4. pack products in appropriate packaging materials, label and store them in designated area, free from pests, flies and infestations PC5. clean, maintain and monitor food processing equipment periodically, using it only for the specified purpose PC6. use safety equipment such as fire extinguisher, first aid kit and eye-wash station when required PC7. follow housekeeping practices by having designated area for materials/tools PC8. follow industry standards such as GMP and HACCP and product recall process PC9. attend training on hazard management to understand types of hazards such as physical, chemical and biological hazards and measures to control and prevent them PC10. identify, document and report problems such as rodents and pests to management PC11. conduct workplace checklist audits before and after work to ensure safety and hygiene PC12. document and maintain raw material, packaging material, process and finished products for the credibility and effectiveness of the food safety control system
Apply food safety practices (for processing food products)	PC13. determine the quality of food using criteria such as aroma, appearance, taste and best before date, and take immediate measures to prevent spoilage PC14. store raw materials, finished products, allergens separately to prevent cross-contamination PC15. label raw materials and finished products and store them in designated storage areas according to safe food practices PC16. follow stock rotation based on FEFO/ FIFO
Knowledge and Understanding (K)	
E. Organizational	The user/individual on the job needs to know and understand:

FIC/N9001 **Food safety, hygiene and sanitation for processing food products**

Context (Knowledge of the organization and its processes)	KA1. organization standards, process standards and procedures followed in the organization KA2. types of products produced by the organization KA3. code of business conduct KA4. dress code to be followed KA5. job responsibilities/duties and standard operating procedures KA6. internal processes such as procurement, store management, inventory management, quality management and key contact points for query resolution KA7. provision of wages, working hours as per organization policy KA8. food safety and hygiene standards followed
B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. possible physical, chemical and biological hazards and methods of prevention of various hazards KB2. personal hygiene requirement KB3. different types of sanitizers used for process area, equipment and the procedure to use them KB4. knowledge on Food Safety Standards and Regulations (as per FSSAI) KB5. quality parameters and quality assessment based on physical parameters, basic food microbiology KB6. labelling/marking requirements for raw materials, finished goods, stored materials, packaging materials and their designated storage area KB7. cleaning and sanitation of equipment and work area KB8. CIP and COP methods and procedures KB9. storage norms for raw materials, packaging material and finished products KB10. stock rotation of ingredients and finished products based on FEFO/FIFO KB11. method of maintaining safety check lists for all machineries KB12. GHP KB13. GMP KB14. HACCP
Skills (S)	
D. Core Skills/ Generic Skills	**Writing Skills**
	The user/ individual on the job needs to know and understand how to: SA1. note the information communicated by the supervisor SA2. note the raw materials used for production and the finished products produced SA3. note the readings of the process parameters and provide necessary information to fill the process chart SA4. note down observations (if any) related to the process SA5. write information documents to internal departments/ internal teams SA6. note down the data for ERP or as required by the organization
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FIC/N9001 **Food safety, hygiene and sanitation for processing food products**

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Entrepreneurship

Contents

Concept of Entrepreneurship

At the end of the session, you will be able to:

- describe the concept of entrepreneurship;
- state the benefits of entrepreneurship.

Concept of Entrepreneurship

Entrepreneurship is doing something new. A person who starts a truck service in an area where there are no trucks, a man who develops salt pans where they do not exist, an inventor who invents a new product are all entrepreneurs. They are doing something new. Entrepreneurship is different from running a business. A man, who runs a textile factory inherited from his father, is a businessman. He is hardly an entrepreneur.
Usually, entrepreneurship has a profit motive behind it. When there is no profit motive, and it is done for the good of the community, it becomes Social Entrepreneurship. A man who starts a free school in an area where there is low literacy may not expect any returns or profit from the school. He is doing it with a motive of benefiting his village or community. He is a Social Entrepreneur.

Who is an Entrepreneur?

An ***entrepreneur*** is one who creates a new business in the face of risk and uncertainty for achieving profit and growth opportunities and assembles the necessary resources to capitalize on those opportunities.

Traits of an Entrepreneur

- Desire for responsibility
- Preference for moderate risk
- Confidence in their ability to succeed
- Desire for immediate feedback
- High level of energy
- Future orientation *(serial entrepreneurs)*
- Skill in organization
- Value of achievement over money
- High degree of commitment
- Willingness to accept risk, work hard and take action
- Flexibility

The Benefits of Entrepreneurship

The primary benefits entrepreneurs enjoy include the opportunity to:

- Create your own destiny
- Create a new product or service
- Make a difference to the society
- Generate impressive profits
- Do what you enjoy and have fun at it!

Notes

Business Opportunities in Entrepreneurship

At the end of the session, you will be able to:

- explore opportunities in the field of business;
- identify the right opportunity in the food processing sector.

Exploring Opportunities

Opportunity is defined as an uncertainty that could have a positive effect on a business leading to benefits or rewards. An opportunity if not availed at an appropriate time may become a threat in the long run as it may be harnessed later by the competition. At a time several opportunities may coexist in the market and a marketer may have to prioritize and identify the right opportunities that he can serve. Focus on the right opportunities brings a strategic advantage into the business while inability to do so makes the business vulnerable to competitive forces.

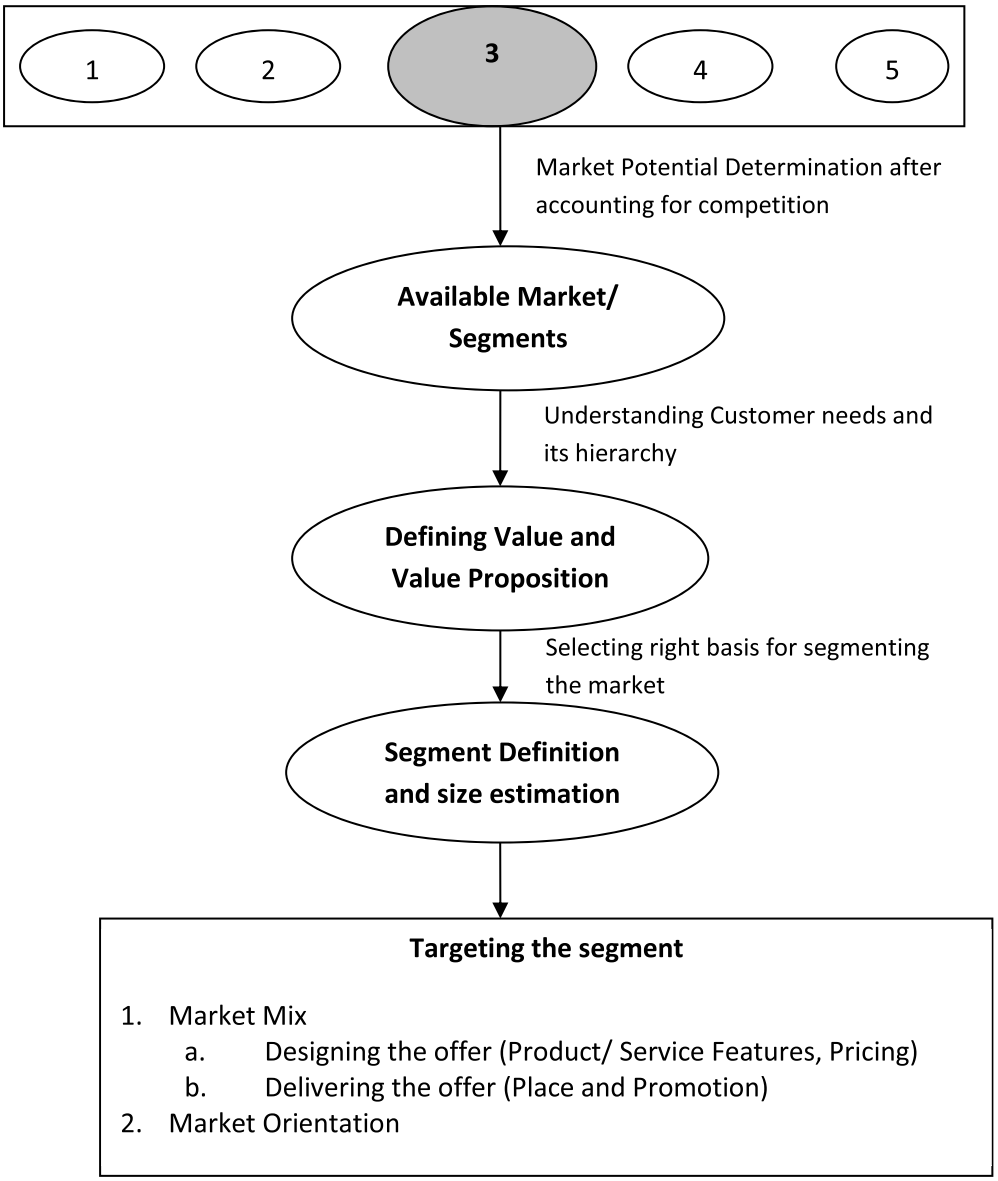
Opportunities and threats refer to external factors that can affect the future of business over which it has no control. Opportunities are observed trends/possible trends in the environment, which are attractive to the firm. Threats are observed/possible trends in the environment that could be detrimental to the firm. Failure to identify opportunities and threats could lead to a position of stagnation.

Assessing opportunity means finding out how big a particular opportunity is. If a rural entrepreneur decides to start a bicycle repair shop, before making any investments, he should have a good idea as to how much money he can make from it. He should also be aware of the capital investments that he would have to make.
Assessing opportunity means finding out the demand for bicycle repair. In order to do that, he first has to estimate the number of bicycles, the frequency of them going in for repairs, the different types of repairs possible and the prices he can charge.

Opportunity Analysis in Steps

- The first and foremost step in opportunity analysis is to prioritize the available opportunities on the basis of their gross market potential.
- The business may select the most promising opportunity by estimating the available market upon excluding the already served market. The served market is usually captured by direct or indirect competition.
- The business then defines the value it can provide to the customers within the available market. On the basis of the value proposition it wants to offer, the business defines the market segment to be served.
- The size of the market segment needs to be estimated to understand the actual potential of the business proposition.
- The next step is of targeting the identified market segment with appropriate marketing mix and market strategy. It involves decisions like product and service features, pricing, promotion and distribution channel.

Identifying the Right Opportunity



Communication Skills

At the end of the session, you will be able to:

- state the different types of communication;
- identify the barriers of communication;
- state the importance of clear communication;
- differentiate between effective and ineffective communication.

What is Communication

Communication is being able to clearly state one's thoughts or message to another person. Communication is the process by which people exchange information and feelings through verbal and non-verbal messages. The act of communication requires skills such as speaking, listening, observing, questioning, processing, analyzing and evaluating.

Communication consists of two aspects, verbal and non-verbal.
Verbal communication includes all the spoken elements. Verbal communication is:

- the use of sounds and language to convey a message.
- it helps us express our desires, ideas and concepts through words.

Non verbal communication includes body language, gestures, facial expressions, eye contact, etc., which also become a part of the communicating process; as well as the written and typed modes of communications.

Communication is successful only when both the sender and the receiver understand the same information as a result of the communication. If there is clarity in communication, that means the goal of communication will be achieved.

Do's and Don'ts of Communication

Do's	Don'ts
Smile	Avoid having an unkind expression
Keep your arms open - Shows positive body language	Do not keep hands on hip – Shows aggressive body language
Be friendly in tone of voice even while teasing your friends	Do not use challenging tone of voice
Welcome juniors	Do not show lack of courtesy in choice of words used
Speak slowly and clearly	Do not be nervous or speak fast
Be respectful in your choice of words	Do not use rude words
Be genuine	Do not use over-polite language; it seems affected

Banking

At the end of the session, you will be able to:

- state the functions of banking.

Why Do We Need Banking

Banking is very important in today's world. People deposit their savings in banks. In return, banks give them an interest on the money deposited. Banks then lend out the same money to various borrowers. They charge the borrowers a higher interest than the interest they pay to the depositors. The difference in the interest is their profit.

The various functions that a banking system serves for a small business are:

- Giving loans to the businessmen at a reasonable interest rate
- Accepting deposits and paying interest on deposits. However, they do not lend out all the money that is deposited. Banks maintain enough cash balance to meet the demand of the depositors as and when needed. So the depositor can earn interest on the deposit, but still has the ability to withdraw his money whenever he wants, with absolutely no risk of default.
- Cheques book facility provides safety, as the account holder need not maintain cash balance. Further, instruments like demand drafts, etc. helps in transferring money from one place to another.

Types of Bank Accounts

Banks generally does not charge any amount for opening an account. A single person/businessman can open multiple types/ numbers of accounts. Joint accounts can be opened with instruction of operating the same by either both the signatories and any one of them. This is very important when one of the partners is not available immediately.

There are a number of different types of bank deposit accounts available. Choosing the right one depends on the circumstances and the purpose for which one wants to open an account. Normally the bank staffs helps in selecting the right type of accounts catering to one's need.

The various types of deposit accounts are:

a. Savings Bank Account

- Normally opened for saving excess funds
- Restrictions on number of transactions (withdrawals) during a period
- Interest is earned on the balance is higher than that earned on current account but less than interest rates earned on fixed deposits.

b. Current Account

- Normally opened by businessmen for day-to-day business transactions
- No restrictions on number of transactions during a period.
- Nil/ Nominal interest is paid on the balance in the account.

c. Fixed Deposit

- Opened to save money for a fixed duration

- Although pre-mature withdrawal (withdrawal before end of fixed period) is allowed, a penal charge (decrease in interest rate) may be imposed.
- Interest rate is highest compared to other types of accounts.

d. Recurring Deposit Account

- A constant amount is deposited regularly at a fixed interval of time (daily, weekly, bimonthly, and monthly, etc.)
- Banks appoint agents who collect the money from your doorstep.
- All deposit along with interest is withdrawn after the specified period (on maturity).
- Interest rate is higher than savings bank account but less than fixed deposits.
- Helpful to businesspersons and other persons who have a regular income

e. Loan Accounts

Borrowers can borrow money from banks. The various types of loan/credit facilities offered by banks are given below.

- Cash credit
- Overdraft facility
- Term Loans

Account Opening Process

The procedure to open an account is very simple.

1. Type of Account: Decide on the type of account to be opened. The bank generally help the depositor decide on the type of account that will be helpful for them.
2. Cheque book facility: Decide whether to avail the cheques book facility or not.
3. Arrange the following documents:
   - Proof of address (Ration card, Voter's Identity card, letter from Village Panchayat, etc)
   - Two photographs of the applicant/s
   - PAN of the applicant/s
4. Introducer: An existing accountholder need to certify that he/she knows the account-holder.
5. Account Opened: After paying the minimum deposit amount after submitting the above documents, the banks open an account in the name of the applicant. Cheque book is issued if the facility is availed.

Bank Pass Book or Statement of Account

Date	Cheque No.	Particulars	Withdrawals	Deposits	Balance

Bank Reconciliation Statement

It is necessary to track the balances in the bank statement/ pass book. Whenever a transaction happens, it is very important to know how much money is in your account. In order to keep a track a statement is prepared at regular intervals. Such statement is called as a bank reconciliation statement.

Bank Reconciliation Statement as on _____ (date)

	Particulars	Amount
	Balance as per bank pass book	
Add	Cheques issued but not presented for payments	
	Wrong credits given by bank	
	Total	
Less	Cheques deposited but not cleared	
	Total	
	Balance as per bank pass book	

Notes

Managing Finance

At the end of the session, you will be able to:

- apply the concept of accounting to make business decisions;
- apply the concept of cost management to make business decisions.

Basics of Accounts

Accounting revolves around three key concepts – EQUITY, ASSETS and LIABILITIES.

- Equity is what the owner in a business has final claim to.
- Assets are things of value. It could be cows, furniture, house, cash, bank deposit, etc.
- Liabilities are what the owner owns to others.

Assume that the owner owns furniture of Rs 2,000 and he has Rs.500 cash in his pocket. He also has a bank balance of Rs.1,200. Also assume that he owes a friend Rs.700 and Rs.200 to the grocer.
In this scenario, his assets are furniture, cash and bank balance. His assets are worth Rs.3,700 and his total liabilities are Rs.900.

Assets	**Amount (Rs.)**
Furniture	2000.00
Cash	500.00
Bank Balance	1200.00
Total	**3700.00**

Liabilities	**Amount (Rs.)**
Payable to a friend	700.00
Payable to grocer	200.00
Total	**3700.00**

Of the total assets Rs.3,700, he has to pay Rs.900 to others. So how much of his assets does he have a claim to?
He has a claim to 3,700 – 900 = Rs.2,800.
That is his equity. Equity means 'having a claim to'. It represents final ownership.

Fundamental Equation of Accounts

- ASSETS = EQUITY + LIABILITIES

This is known as the fundamental equation of accounting.

Transactions

A transaction is an economic exchange. Buying and selling are transactions. Getting a loan, giving a loan, repaying a loan, paying salaries, paying electricity bills are all transactions.
A transaction often changes the values of assets, equity and liabilities. The accounting equation however remains unchanged.

Business Entity Concept

When we write books of account, we do not consider personal expenses. We treat that the business is separate from the person. In other words, we treat the business as a separate person for the accounting purposes. Personal expenditures are not mixed with business expenditures. Accountants call this as a business entity. Business entity concept means that the business is a separate entity (i.e. person) from the owner for accounting purposes. Usually, when someone starts a business, he opens a separate bank account for the business. He also keeps business cash separately from his personal cash.

Assets

Assets are things that have monetary value that can be measured and can be expressed in terms of money e.g. cash, investments, amounts receivable from others, inventory (ie stock of goods in hand), land, buildings, equipment, and vehicles.

Liabilities

Liabilities refer to the obligations of the owner. They are moneys the owner has to pay in future. They refer to the amounts owed to lenders, suppliers, amounts received in advance for a future sale or for a future service to be performed.

Examples of liabilities	Description
Loan from bank	Amount owed to lenders
Amount payable to suppliers of raw material who have given credit	Amounts owed to suppliers
Advance received from customers, outstanding expenses i.e. expenses incurred but not paid off	Salaries pending to employees

Income, Expenses and Profits

Income refers to all sales of goods or services. As an example, consider a businessperson who sells saris. If he buys a sari for Rs.300 and sells it for Rs.400, then the sale of Rs.400 is his income. Note the income refers to the sales and not to the moneys earned. In this example, Rs.300 is the expense and profit is Rs.100.

- Income increases Equity
- Expense decreases Equity

Sale and Purchase of Goods on Credit

A Sale is considered an income whether goods are sold on credit or for cash. When it is sold for cash, cash assets increases. When it is sold on credit, receivables, another asset increases. In both cases, it is considered an income.
Similarly, expenses are recognized whether cash is paid out or not. When cash is paid out, cash, asset decreases. When cash is not yet paid, payables, a liability increases. In both cases, it is considered as an expense.

Expenses v/s expenditure

Just because it is an expense it does not mean that cash is paid out. Similarly, just because cash is paid out does not make it an expense. When a business purchases goods or services, it is expenditure. Expenditure necessarily involves a cash payout. But it may not be an expense.

Profits

PROFIT = INCOME - EXPENSE
Income increases equity and Expenses decrease equity. The net increase in equity from business is the profit.

Financial Statements

Financial statements, summarizes the accounts of the business. They are the result of the collection, tabulation and summation of accounting data. The two main financial statements are-

- Balance Sheet
- Profit and Loss Statement

Balance Sheet

It is a statement showing financial condition (position) of a business at a point in time. It is the summary of all assets one side and 'liabilities and equity' on the other side. Both sides of the balance sheet should always match.

A TYPICAL BALANCE SHEET

As on Mar 31, YYYY

Liabilities and Capital	**Amount**	**Assets**	**Amount**
Capital	10000.00	Land & Buildings	5000.00
Retained Earnings	5575.00	Furniture	3000.00
Bank Loans	1500.00	Vehicles (Motor Car/ Scooter/ Cycle)	2000.00
Creditors	1000.00	Security Deposits Paid	1500.00
Advance Received from customers	425.00	Bank Balance	2000.00
Outstanding Expenses		Receivables	3000.00
- Rent Due but not Paid	750.00		
- Salary Outstanding	250.00	Prepaid Expenses	
		- Prepaid Insurance	500.00
Income Received in Advance			
- Commission received in advance	500.00	Cash in hand	3000.00
	20000.00		**20000.00**

Profit and Loss Statement

This statement shows the results of business for the period. It summarizes the income and expense for the period. The result of the account is either the profit or loss for the period.

A TYPICAL PROFIT AND LOSS ACCOUNT
As on Mar 31, YYYY

Expenses	**Amount**	**Income**	**Amount**
To Cost of Goods Sold	10000.00	By Sales	18000.00
Direct Expenses		**Direct Incomes**	
- Carriage Inward	1800.00	- Discount Received on Purchase	1000.00
- Commission on purchase	1200.00	-	
Gross Profit / (Loss)	7000.00		
	20000.00		**20000.00**
Indirect Expenses:		Gross Profit/ (Loss)	7000.00
- Rent	500.00		
- Salaries	400.00	**Indirect Incomes**	
- Electricity	450.00	- Sale of Old Newspaper	500.00
- Insurance	150.00	- Commission Received	300.00
- Bank charges	100.00	- Rent received on sublet	200.00
- Conveyance	250.00		
- Postage	125.00		
- Telephone	200.00		
Loss on sale of assets	250.00		
Net Profit/ (Loss)	5575.00		
	8000.00		**8000.00**

What is Cost

In simple terms, cost the amount spent in getting something.
Let us consider an example of a maker of shirts.
Cost of materials and services to make a shirt:

- cloth Rs.150
- buttons and others Rs.5
- tailoring charges Rs.50

then the cost of the shirt is Rs.205.
The shirt could be sold for Rs.400. The cost is still remains Rs.205.

Rs.400 is called the 'Selling Price' or 'Price'. It has nothing to do with cost.
Selling price is decided by the maker of the shirt. Cost is determined by the amount of money it takes to make the shirt.

Direct Costs and Indirect Costs

- Direct costs can be directly traced to a product or a department, and hence can be charged directly to the product. For example, direct material cost, direct labour costs, etc.
- Indirect costs are common cost across departments. They cannot be allocated to a product or department but is apportioned on a suitable basis among the departments.

Variable Cost and Fixed Cost

- Variable Cost is the cost that tends to vary proportionately with the level of activity within the relevant range and within a given period. For example, clothes required for manufacturing a shirt varies directly with the number of shirts that are manufactured and hence the cost of clothes is variable. The cost is constant per unit.
- Fixed Costs remain constant in total regardless of changes in volume up to a certain level of output. They are not affected by changes in the volume of production. For example, rent of the office, etc.

Sunk Cost and Relevant Cost

- Sunk Costs are those for which the expenditure has taken place in the past. This cost is not affected by current and future decisions.
- Relevant Costs are the costs that are appropriate and that affect the decision in hand.
  In any decision-making situation, such as make or buy, buy or lease, etc. only the relevant cost are taken into consideration while evaluating the various options.

- **Break Even Analysis**

Break-even analysis is a technique where total variable and fixed costs are compared with sales revenue in order to determine the level of sales volume, sales value or production at which the business makes neither a profit nor a loss (the "break-even point"). It also helps us determine the sales quantity, which will enable us to make a make a certain amount of profit.

Summary

1. All costs can be classified under the two heads – Variable cost and Fixed Cost
2. Variable cost per unit is constant, no matter what the level of output is. Total variable cost varies proportionately with level of output.
3. Total fixed cost is constant for all levels of production. It does not vary with actual number of units produced.
4. Selling price per unit is constant.
   Variable cost, fixed cost, selling price can be determined in advance.

Interpersonal Relationships

At the end of the session, you will be able to:

- describe the role of communication and behaviour in a business relationship;
- state the importance of interpersonal skills to maintain good relationships at the workplace.

What are Interpersonal Skills

The ability to develop fruitful relationships with others is called interpersonal skills. You would be working with other members in the team at your workplace. Therefore knowing how to develop healthy working relationships with people at the workplace will contribute significantly to your success. Most importantly building a rapport with the customer, earning his trust, providing him excellent customer service depends largely on having excellent interpersonal skills.

How Can You Develop Good Interpersonal Skills

Effective communication plays a key role in developing good interpersonal skills.

- Non verbal communication which result in achieving positive interpersonal skills are:
  - smile and eye contact
  - use of correct postures and gestures
  - touch.
- Listening is an activity of paying attention to and trying to get meaning from something we hear.
  - It patiently conveys that “you care”
  - It enables you to understand other people’s viewpoints and empathize with their situation.
- Verbal communication which result in achieving positive interpersonal skills are:
  - voice
  - intensity
  - sounds
  - giving criticism in a positive manner.

Managing Networks

At the end of the session, you will be able to:

- explain the concept of networking;
- demonstrate the steps involved to create business networks;
- state the benefits of networking in business.

What is a Network

A Network is "An extended group of people with similar interests or concerns who interact and remain in an informal contact for mutual assistance or support" (The American Heritage Dictionary, 2000)

In India social networks are present almost everywhere. To begin with, the multiple systems of belongingness are a basis for starting a relationship or a network. Many of us recall the question when we enter a new system, "Where are you from? What is your native place?"

Family, school, neighborhood are some of the basis for relationships. In addition, we may be customers to some and suppliers to others.

Why Network

In India, networks come alive in social events, or when there is a crisis. Flood, fire or earthquakes are prime examples when a large part of the society gets into action and contributes however they can. At a micro level many of us recall experiencing a sense of social warmth when we are affected by a major sickness or death of a family member and a large member of people turn up.

Networks can also be purposive i.e. focused on a specific purpose. However, many networks, apart from the main purpose, simultaneously provide opportunities for building strong relationships; provide access to information and mobilize available knowledge wisdom for learning. Some of the objectives/purposes of a network include:

- Brokering (Mediating)
- Building a common perspective
- Implementing Large Scale Changes

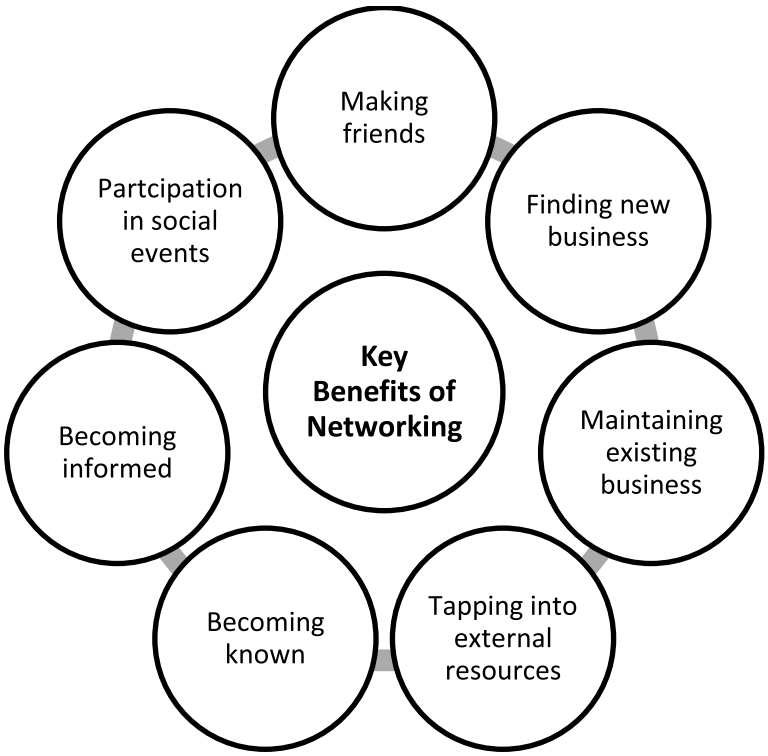
Roles Played in the Network

Seen earlier relationships have three elements: understanding, trust and tolerance. Those relationships having more of these elements are stronger (e.g. networking in the family). A group of co-travelers in the train have relationships that have less of these elements and thus the relationships are weaker.

Depending on the relationship as well as the situational context, individuals in the network perform various roles as follows:

- Advisor
- Informer/Grapevine
- Merchant
- Inspiration
- Expert

Key benefit of Networking



Food Laws

At the end of the session, you will be able to:

- state the need for food laws;
- state the important food laws.

Need for Food Laws

- To meet a country's sanitary requirements, food must comply with the local laws and regulations to gain market access.
- These laws ensure the safety and suitability of food for consumers.

- The Indian Parliament has recently passed the Food Safety and Standards Act, 2006 that overrides all other food related laws, such as:
    - 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 are repealed after commencement of FSS Act, 2006.

Food Safety and Standards Authority of India (FSSAI)

The Food Safety and Standards Authority of India (FSSAI) has been established under Food Safety and Standards Act, 2006 which consolidates various acts and orders that have hitherto handled food related issues in various Ministries and Departments.
FSSAI has been created for laying down science based standards for articles of food and to regulate their manufacture, storage, distribution, sale and import to ensure availability of safe and wholesome food for human consumption.

Functions Performed by FSSAI

Framing of Regulations to lay down the standards and guidelines in relation to articles of food and specifying appropriate system of enforcing various standards.

Bureau of Indian Standards (BIS)

The Bureau of Indian Standards (BIS), the National Standards Body of India, resolves to be the leader in all matters concerning Standardization, Certification and Quality

AGMARK

Standards are being harmonized with international standards keeping in view the WTO requirements. Certification of agricultural commodities is carried out for the benefit of producer/manufacturer and consumer.
Products available under AGMARK are as follows:

- Pulses
- Whole spices & ground spices
- Vegetable oils
- Wheat Products
- Milk products.

Fruit Product Order (FPO), 1955

The main objective is lay down quality standards to manufacture fruit & vegetable products maintaining sanitary and hygienic conditions in the premises.

Meat Food Products Order (MFPO)

The main objective is to regulate production and sale of meat food products through licensing of manufacturers, enforce sanitary and hygienic conditions prescribed for production of wholesome meat food products, exercise strict quality control at all stages of production of meat food products, fish products including chilled poultry etc.

Milk and Milk Product order (MMPO)

The objective of the order is to maintain and increase the supply of liquid milk of desired quality in the interest of the general public and also for regulating the production, processing and distribution of milk and milk products.

Prevention of Food Adulteration Act, 1954

The Act was promulgated by Parliament in 1954 to make provision for the prevention of adulteration of food. Broadly, the PFA Act covers food standards, general procedures for sampling, analysis of food, powers of authorized officers, nature of penalties and other parameters related to food.

Self - Assessment

At the end of the session, you will be able to:

- conduct a self – assessment to identify strengths and weaknesses;
- practice goal setting and plan activities to achieve the same.

Strengths	**Weaknesses**
Opportunities	**Threats**

Business Plan

At the end of the session, you will be able to:

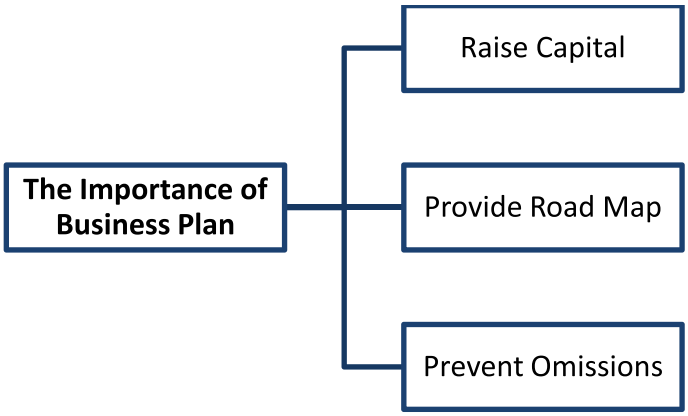
- explain the purpose and importance of business plan;
- describe the components of a business plan;
- create a business plan;
- state the features of a bankable projects;
- identify the various types of risks and challenges in setting up a business;
- explore the possibilities of using technology effectively in the business setup;
- state the process of setting up a business.

Business Plan

A business plan is a document that contains the objectives, scope and direction for your business. It aids in determining the feasibility of your business ideas and raise capital. It is a road map for your business operations.

The purpose of writing a business plan is to detail:

- what you seek to achieve;
- how you intend to take to achieve it.



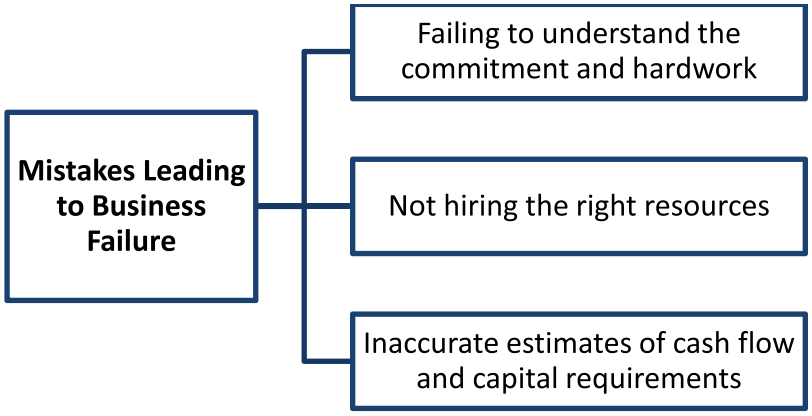
There is no rigid formula existing for writing business plans. Every new business may be unique to the business situation or idea. Even so, there are some general guidelines to be followed while preparing a business plan.
A business plan is a detailed project report that becomes a base document for planning and implementing. It serves as collateral with future cash flow and profitability, to be acceptable to raise the necessary funds (bankable project).
After the preparation of a business plan, it is advisable to get expert advice of the concerned areas of operations and modify it accordingly.

Components of a Business plan

The major sections of a business plan include the detail of the business idea, the formation of type of company/ business, products or services, manufacturing and operations plan, marketing plan, the team, critical risks and assumptions, benefits to the community, exit strategy, financial plan (sources and uses of funds), possible contingencies that you should anticipate etc.

Understanding the Risks of Small Business

The decision to start your own business should be made with a full understanding of the risks involved. You should be able to anticipate problems and reduce the possibility of loss, and increase your chances of success.
The prospect of failure should serve as a warning to you. You need a vision, resources, and a plan to take advantage of the opportunity that exists.



Business risk can be classified into risk of damage to assets and risk of personal lives. Damage to assets like plant and machines can be avoided by way insuring the assets, which also includes cash (loss due to theft etc). Personal insurance for own life is covered by life insurance periodical premium payments.

Form of Business

The entrepreneurs may decide to set up the business on its own or may decide to start jointly with others. The various factors that one needs to consider while deciding on form of organization are funds required, risk associated with the projects, length of the project, etc. In case of partnership, there is an added requirement on deciding the terms of the agreement, capital ratio, profit sharing, legal documentation, etc.

Sources of funds

The entrepreneur should calculate the total funds required under the following heads:

- Fixed Capital Requirement: the funds required to acquire fixed assets for the business. These can be owner's capital investment or long-term loans.

- Working Capital Requirement: the minimum funds required to effectively cover the costs and expenses necessary to operate the business.

Cash Flow Statement

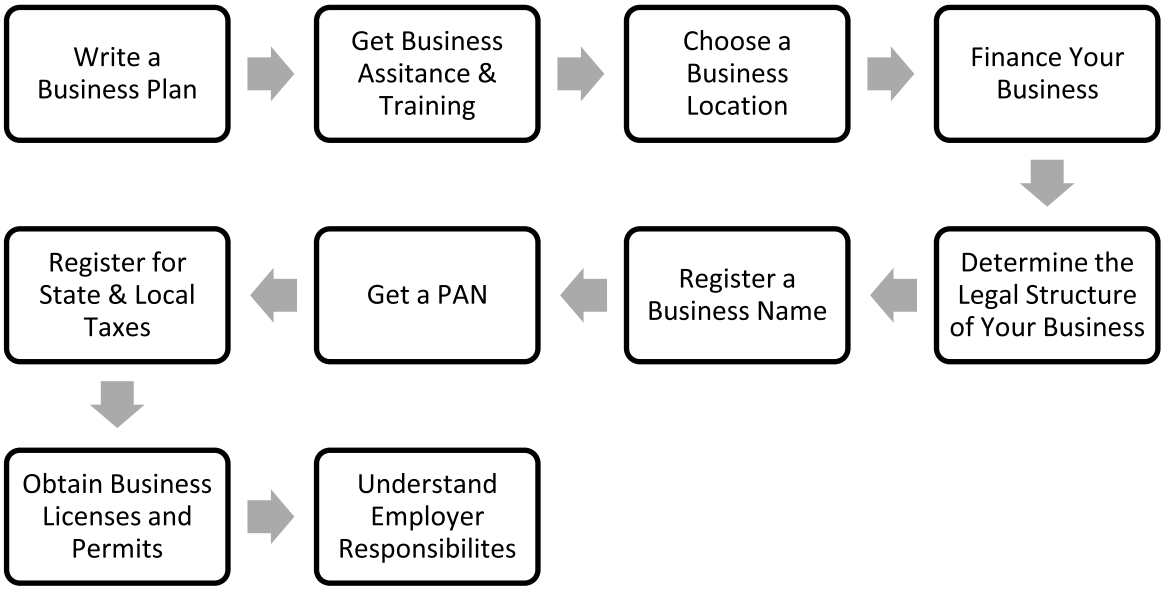
A cash flow statement shows how money enters and exits your business. It is a financial document that shows the amount of money a business has on hand at the beginning of a time period, receipts coming into the business, and money going out of the business during the same period.

Evaluation of Profitability

Profitability should not be measured in terms of absolute profit amount. Rather, profitability means the returns as a percentage of capital invested in the business.

Ten Steps Process of Setting up the business

Now, we come to the actual process of setting up the business. Given below is a simple ten-step process to follow:



My business idea is here.....

Exercise

You should ask these twenty questions to yourself before considering entrepreneurship. Read the clue given in brackets for possible answers.
(*Source: 20 Questions Before Starting. (n.d.). Retrieved May 1, 2015, from https://www.sba.gov/content/20-questions-before-starting-business*)

1. **Why am I starting a business?**
   (is it to make a lot of money, to fulfil a need in the market, to compete with the existing market, to introduce an innovation)

   _____

2. **What kind of business do I want?**
   (think about the type of activity you will be engaged in, where you will operate from - home-based, online, small office/ setup etc.)

   _____

3. **Who is my ideal customer?**
   (think about the demographic you wish to serve – age group, socio-economic class, their characteristics etc.)

   _____

4. **What products or services will my business provide?**
   (think about what will you offer as products/ services and in what form)

   _____

5. **Am I prepared to spend the time and money needed to get my business started?**
   (you will be working for longer hours every day and may be even weekends too. Also need to have a enough savings or at least an assured sum to establish your business)

   _____

6. **What differentiates my business idea, and the products or services I will provide, from others in the market?**
   (this is to see if you are offering something new or better than what already exists in the market, what is it that makes your product stand out, something unique or valuable to offer that will sell)

   _____

7. **Where will my business be located?**
   (will you operate out of home, buy a place, or rent one, if your business requires you to be visible and easily reachable)

   _____

8. **How many employees/ workers will I need?**
   (you need to know exactly how many people you need to get the work done, and whether you have adequate funds to pay them, you may outsource some work)

   _____

9. **What types of suppliers do I need?**
   (suppliers are those who provide raw material for creating your product, or to resell your finished product)

   _____

10. **How much money do I need to get started?**
    (the money required to set up the business and begin work)

    _____

11. **Will I need to get a loan?**
    (how will you organise the funds to start the business, will you apply for a loan, approach funders, tap into your own resources)

    _____

12. **How long will it take before my products or services are available?**
    (the time you will need to be ready to launch your product or service, you need to set tentative deadlines)

    _____

13. **How long do I have until I start making a profit?**
    (you need to have some idea of how long it will be before you can break even and make a profit)

    _____

14. Who is my competition?

(you need to know who your competitors, you should also be certain of the strengths of your product or service)

_____

15. How will I price my product compared to my competition?

(this will depend on your target audience and how you choose to place your product in the market)

_____

16. How will I set up the legal structure of my business?

(sole proprietorship, partnership, franchisee, do you need any license or certification to start, have you collected the information regarding this, how long it takes to get the legalities done etc.)

_____

17. What taxes do I need to pay?

(sales tax, service tax, professional tax - you need to be aware of which taxes apply to you)

_____

18. What kind of insurance do I need?

(you may need to insure the premises or the machinery you have invested in)

_____

19. How will I manage my business?

(this refers to the people and processes you will need to run your business effectively)

_____

20. How will I advertise my business?

(will you use print, online channels, local cable TV operators, friends etc. for promoting your business)

_____

Notes

Notes

Motivation

At the end of the session, you will be able to:

- identify ways to motivate yourself;
- differentiate between internal and external motivation to sustain a business.

Motivation

Motivation is necessary to achieve anything. Motivation is what pushes people to act and it is an important ingredient for success in life. Most of us have goals, but the difference between those who actually go out and achieve their goals and those who don't is in people's level of motivation. While motivation can be artificially created by external factors such as facing negative consequences for not doing something, the most powerful motivation comes from within.

Types of Motivation

External	Internal
• driven by desire • to gain reward or avoid negative consequences • to achieve short-term goals	• true passion to fulfil a dream • less dependent on reward or negative consequences • to achieve long-term goals

Valuing Self

1. List three things you really do well.
2. List three things you do fairly well.
3. List three things you would like to be able to do.
4. List of three things you like about yourself in each of these categories: Appearance Personality Abilities Which of these listed do you value the most and why?
5. If you could be an animal for a day, which animal would you choose to be and why? Draw the animal.
6. Choose one of your friends. Write a description of the ways in which your friend is special to you. Show your friend what you have written. Ask your friend to write comments about what you have written.
7. Complete these sentences: I feel angry when….. I feel jealous when….. I feel disappointed when….. I am happiest when….. I am proud of myself when…..

Notes

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