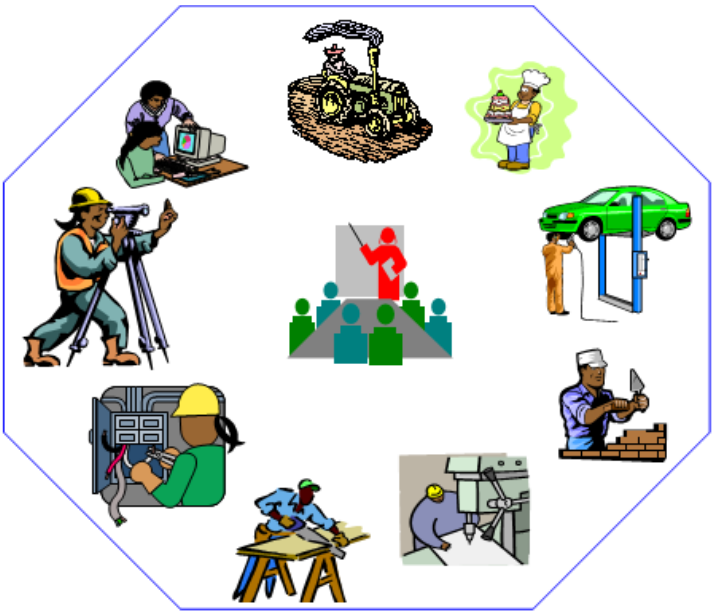
Cereal processing

Level-III



Based on October 2019, Occupational standards

Version 2

Module Title: Preparing Batter, Baking and Decorating Sponges, Cakes and Cookies

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Table of content

LG #21	LO #1- Clean equipment

Instruction sheet

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- Cleaning equipment
- Disposing wastes
- Maintaining work area with housekeeping standards
- Conducting work with workplace environmental guidelines

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Clean equipment
- Dispose wastes
- Maintain work area with housekeeping standards
- Conduct work with workplace environmental guidelines

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below.
3. Read the information written in the information Sheets
4. Accomplish the Self-checks
5. Perform Operation Sheets
6. Do the “LAP test” back to “Operation sheets”.

Information Sheet 1- Cleaning equipment

1.1 Introduction

Cleaning is a physio-chemical process involving a number of factors. It is a process, not just pouring a chemical onto a surface, wiping it around, and declaring that the surface has been cleaned, disinfected, and sanitized. There are three steps in a complete cleaning process. The first is washing. The function of the wash step is to ensure that the cleaning agent makes contact with the soil on the surface, to remove soil from the surface and keep it away from the surface. The next step is rinsing. Thorough rinsing is essential to remove the cleaning agent; it may also continue the cleaning action. Drying, the third step, removes water and volatile residue.

1.2 Bakery equipment

Baking becomes enjoyable if you have a complete baking tools and equipment needed for baking. Baking can be made easy and fast when all the necessary tools and equipment are available.

- **Rack oven**

A large oven into which entire racks full of sheet pans can be wheeled for baking

Figure 1. Rack oven

- **Mechanical oven**

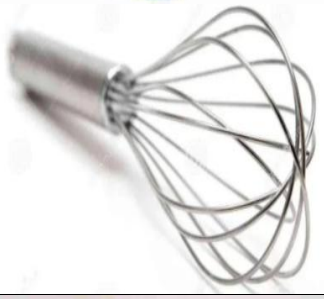
The food is in motion while it bakes in this type of oven. The most common types are a revolving oven, in which his mechanism is like that of a Ferris wheel. The mechanical action eliminates the problem of hot spots or uneven baking because the mechanism rotates throughout the oven. Because of its size it is especially used in high volume operations. It can also be equipped with steam ejector.

Figure 2. Mechanical oven

Table 1. Basic equipments used for cake and cookies processing

List of Equipment	Function	Picture
Cake tin	✓ Dark-coloured silicone bakeware has a tendency to absorb heat and make the sides of the cake dark. ✓ It's essential to use the correct tin size and shape stated in the recipe.	
Cooling rack	✓ This is an essential piece of equipment for helping air to circulate around your freshly baked cake or biscuits, avoiding sogginess during the cooling process	
Mixng bowl	✓ Hold ingredients until properly mix	
Flour sifter	✓ Used for sifting flour	

Grater	✓ Used to grat chees, chocolate and fress fruits	
Measuring spoon	✓ Measure rcipes	
Electric mixer	✓ Is used for different baking procedure for beating, stirring, and blending	
Measuring cups	✓ Measuring cups: Consist of two types namely: ✓ A graduated cup with fractions (1, ¾, 2/3, ½, 1/3, ¼, 1/8) marked on each side. ✓ A measuring glass made of transparent glass or plastic is more accurate for measuring	

Weighing scale	✓ Weighing scale Is used to measure ingredients in large quantities	
Wire whisk	✓ Used to beat or whip egg whites or cream	
Wooden spoon	✓ Is also called mixing spoon which comes in various sizes suitable for different types of mixing	
Beater	✓ Used in beating eggs or whipping cream.	
Manual loader	✓ Used to transfer dough or batter to the oven	

Lifting machine	✓ Used to uplift and unload dough or batter to the next steps.	

Tube Center Pan	✓ Deeper than a round pan and with a hollow center, it is removable which is used to bake chiffon type cakes.	
Muffin pan	✓ Has 12 formed cups for baking muffins and cup cakes.	
Cake Pans	✓ Comes in different sizes and shapes and may be round square rectangular or heart shaped.	
Jelly Roll/Pan	✓ Is shallow rectangular pan used for baking rolls	

Bundt /Pan	✓ Is a round pan with scalloped sides used for baking elegant and special cakes	

1.3 Cleaning methods of bakery equipment

A key part of safe food manufacturing is cleanliness, which is why solid cleaning-in-place (CIP) and cleaning-out-of-place (COP) systems are essential.

1.3.1 Clean-in-Place (CIP)

Clean-in-place (CIP) is a cleaning method widely used in the food, dairy, pharmaceutical, brewing and winemaking industries that require the highest standards of plant hygiene.

CIP implies cleaning equipment and its parts without disassembling them. CIP methods can include:

- Soaking/agitation systems
- Solvent refluxing
- High-impact spray-cleaning
- Turbulent flow systems

The time for rinse and wash cycles varies from five minutes to one hour. To ensure product quality, operators must use the appropriate amounts of cleaning solutions and make sure those solutions have been removed completely before the next processing run.

The components of a CIP system are:

- Storage and recirculation tanks
- Supply pump (centrifugal or positive displacement)
- Piping for connection of pieces of equipment
- Valves and fittings for controlling flow
- Heat exchangers
- Water addition assembly (e.g., spray nozzles)

Systems that can be cleaned-in-place include equipment, accessories, and fittings:

- Piping
- Valves

- Pumps
- Filters
- Augers or dough pumps
- Storage vessels
- Heat exchangers (e.g., tubular, plate)

The main advantages CIP systems include:

- Cleaning efficiency
- Improved operator's safety
- Shorter downtime and setup time
- Reduction or elimination of cross contamination
- Money savings in labor

1.3.2 Clean out place (COP)

Manufacturers use COP methods for pieces of equipment and utensils that cannot be cleaned where they are used and must be disassembled, and for pieces of equipment and parts that do not lend themselves to easy cleaning in place. Some process items, such as hoses, clamps, gaskets, valves and other disassembled equipment parts cannot be cleaned in place. When this is the case, you can choose the unreliable cleaning results of manual cleaning or achieve your sanitary cleaning goals with a reliable clean-out-of-place system. COP uses the same cleaning solutions as CIP. Automated COP requires less labor and leaves less room for human error than manual cleaning.

A COP system, on the other hand, consists of one or more rectangular tanks that use pumps, high pressure nozzles, caustics, acids, hot water, and plain old elbow grease to clean the outside surfaces of external parts, such as hoses, clamps, fittings, filling nozzles, trays, knives, conveyor belts, and other components that CIP can't handle. Parts have to be removed and disassembled, cleaned, then put back, just like washing dishes in a sink or dishwasher.

Self-check 1	Written test

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I Short Answer Questions (2pts each)

1. List some of the cleaning systems of bakery equipment and machine?
2. Describe the equipments and machines used in cake and cookies baking?
3. Write the difference between clean-in-place and clean-out place cleaning methods?

Test II Write true if the statement is correct and false if statement is incorrect (2pts each)

1. Clean-in-place equipment, accessories, and fittings include piping, valves, pumps and filter?
2. Cleaning is a physio-chemical process involving a number of factors?

Note: Satisfactory rating - 10 points **Unsatisfactory - below 10 points**

You can ask you teacher for the copy of the correct answers.

Score = _____

Rating: _____

Information Sheet 2- Disposing wastes

2.1 Introduction

The bakery industry is one of the world's major food industries and varies widely in terms of production scale and process. Traditionally, bakery products may be categorized as bread and bread roll products, pastry products (e.g. pies and pasties) and speciality products (e.g. cake, biscuits, donuts and speciality breads). Bakery process generates lots of waste which can be either disposed of or can be recycled in many cases. Bakery waste management needs clear strategy for identification, segregation, storage and disposal.

2.2 Types of waste generate in bakery plant

During bakery product processing a lot of wastes generated at different stages of unit operation.

2.2.1 Process waste

These can be sold out to suppliers who deal into cattle feeding. Precaution should be taken that none of these have contamination so that it can be used for cattle feeding.

- Unfit dough/batter
- Flour dust
- Sugar dust
- Burnt cookies
- Broken Biscuit
- Burnt loaves or rejected loaves
- Market returned old bakery products

2.2.2 Packaging

Most of these are can be recycled by packaging material suppliers

- Wrappers
- Tins
- Cardboard boxes
- Bags
- Cores
- Polythene
- Sacks
- Plastic Trays and Pallets

2.2.3 Solid waste

- Metallic scrap
- Wooden Pallets and other
- Papers
- Bakery waste water dry Sludge

2.2.4 Waste water

Waste-water in bakeries is primarily generated from cleaning operations including equipment cleaning and floor washing. It can be characterized as high loading, fluctuating flow and contains rich oil and grease. Flour, sugar, oil, grease and yeast are the major components in the waste. The waste-water from cake plants have higher strength than that from bread plants. The pH is in acidic to neutral ranges, while the 5-day biochemical oxygen demand (BOD_5) is from a few hundred to a few thousand mg/l, which is much higher than that from the domestic wastewater.

The suspended solids (SS) from cake plants are very high. Grease from the bakery industry is generally high, which results from the production operations. The waste strength and flow rate are very much dependent on the operations, the size of the plants and the number of workers.

Generally speaking, in the plants with products of bread, bun and roll, which are termed as dry baking, production equipment (e.g. mixing vats and baking pans) are cleaned dry and floors are swept before washing down. The waste-water from cleanup has low strength and mainly contains flour and grease. On the other hand, cake production

generates higher strength waste, which contains grease, sugar, flour, filling ingredients and detergents

2.2.5 Other waste

- Fat & oil contaminated
- Spent Oil from machinery

2.3 Bakery waste treatment

Generally, bakery industry waste is nontoxic. It can be divided into liquid waste, solid waste and gaseous waste. In the liquid phase, there are high contents of organic pollutants including chemical oxygen demand (COD), BOD_5, as well as fats, oils and greases (FOG) and SS. Waste-water is normally treated by physical, chemical and biological processes.

2.3.1 Pre-Treatment Systems

Pre-treatment or primary treatment is a series of physical and chemical operations, which precondition the waste-water as well as remove some of the wastes. The treatment is normally arranged in the following order: screening, flow equalization and neutralization, optional FOG separation, optional acidification, coagulation-sedimentation and dissolved air flotation. In the bakery industry, pretreatment is always required because the waste contains high SS and floatable FOG.

Pre-treatment can reduce the pollutant loading in the subsequent biological and/or chemical treatment processes; it can also protect process equipment. In addition, pretreatment is economically preferable in the total process view as compared to biological and chemical treatment.

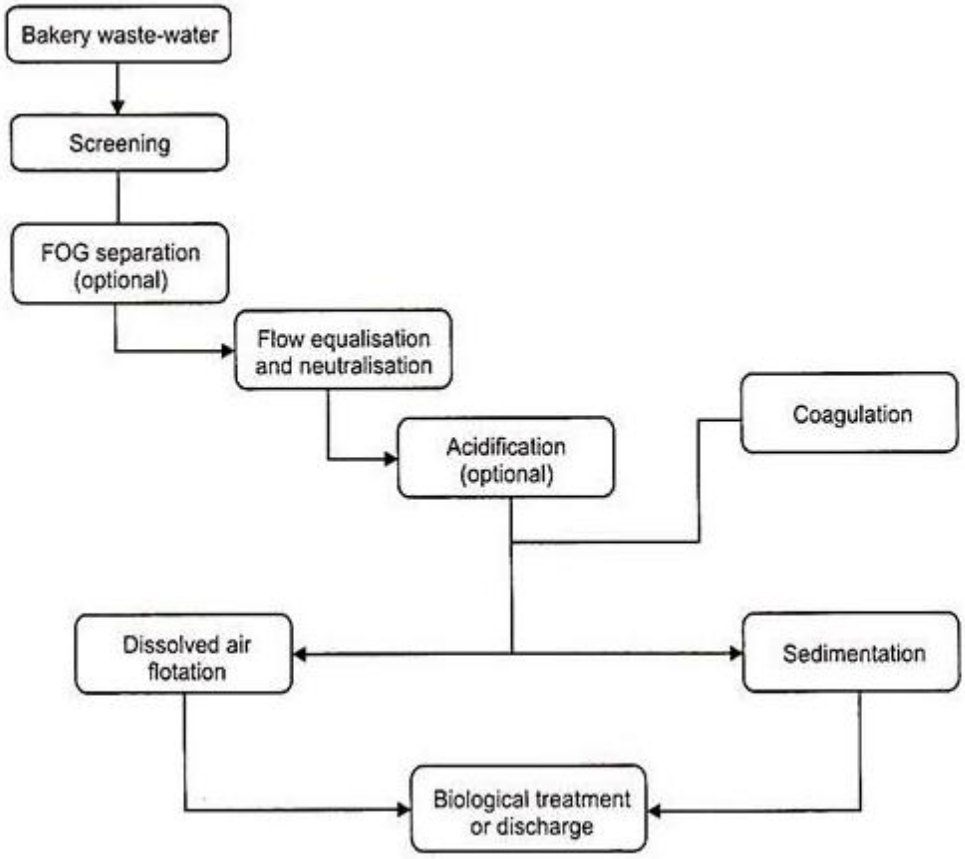


Figure 3: Bakery waste water treatment process flowdiagram

I. Flow equalization and neutralization

In bakery plants, the waste-water flow rate and loading vary significantly with the time. It is usually economical to use a flow equalization tank to meet the peak discharge demand. However, too long a retention time may result in an anaerobic environment. A decrease in pH and bad odours are common problems during the operations.

II. Screening

Screening is used to remove coarse particles in the influent. There are different screen openings ranging from a few µm (termed as micro screen) to more than 100 mm (termed as coarse screen). Coarse screen openings range from 6-150 mm; fine screen openings are less than 6 mm. Smaller opening can have a better removal efficiency; however, operational problems such as clogging and higher head lost are always observed.

Fine screens made of stainless material are often used. The main design parameters include velocity, selection of screen openings and head loss through the screens. Clean operations and waste disposal must be considered. Design capacity of fine screens can be as high as 0.13 m^3/sec; the head loss ranges from 0.8-1.4 metre. Depending on the design and operation, BOD_5 and SS removal efficiencies are 5-50 per cent and 5-45 per cent, respectively.

III. FOG Separation

As waste-water may contain high amount of FOG, a FOG separator is thus recommended for installation. The FOG can be separated and recovered for possible reuse, as well as reduce difficulties in the subsequent biological treatment

IV. Acidification

Acidification is optional, depending on the characteristics of the waste. Owing to the presence of FOG, acid (e.g. concentrated H_2SO_4) is added into the acidification tank; hydrolysis of organics can occur, which enhances the bio treatability. Grove designed a treatment system using nitric acid to break the grease emulsions followed by an activated sludge process. A BOD_5 reduction of 99 per cent and an effluent BOD_5 of less than 12 mg/l were obtained at a loading of 40 lb BOD_5/1000 ft^3 and detention time of 87 hours. The nitric acid also furnished nitrogen for proper nutrient balance for the biodegradation.

V. Coagulation-Flocculation

Coagulation is used to destabilize the stable fine SS, while flocculation is used to grow the destabilised SS, so that the SS become heavier and larger enough to settle down. The Coagulation-flocculation process can be used to remove fine SS from bakery waste-water. It normally acts as a preconditioning process for sedimentation and/or dissolved air flotation.

The waste-water is preconditioned by coagulants such as alum. The pH and coagulant dosage are important in the treatment results. Liu and Lien reported that 90-100 mg/l of alum and ferric chloride were used to treat waste-water from a bakery that produced

bread, cake and other desserts. The wastewater had pH of 4.5, SS of 240 mg/l and COD of 1307 mg/l.

VI. Sedimentation

Sedimentation, also called clarification, has a working mechanism based on the density difference between SS and the water, allowing SS with larger particle sizes to more easily settle down. Rectangular tanks, circular tanks, combination flocculator-clarifiers and stacked multilevel clarifiers can be used.

2.3.2 Biological Treatment

The objective of biological treatment is to remove the dissolved and particulate biodegradable components in the waste-water. It is a core part of the secondary biological treatment system. Micro-organisms are used to decompose the organic wastes. With regard to different growth types, biological systems can be classified as suspended growth or attached growth systems. Biological treatment can also be classified by oxygen utilization aerobic, anaerobic and facultative. In an aerobic system, the organic matter is decomposed to carbon dioxide, water and a series of simple compounds. If the system is anaerobic, the final products are carbon dioxide and methane.

Compared to anaerobic treatment, the aerobic biological process has better quality effluent, easier operation, shorter solid retention time, but higher cost for aeration and more excess sludge. When treating high-load influent (COD > 4000 mg/l), the aerobic biological treatment becomes less economic than the anaerobic system. To maintain good system performance, the anaerobic biological system requires more complex operations. In most cases, the anaerobic system is used as a pretreatment process.

Suspended growth systems (e.g. activated sludge process) and attached growth systems (e.g. trickling filter) are two of the main biological waste-water treatment processes. The activated sludge process is most commonly used in treatment of waste-water. The trickling filter is easy to control and has less excess sludge. It has higher resistance loading and low energy cost. However, high operational cost is its major disadvantage. In addition, it is more sensitive to temperature and has odour problems.

Comprehensive considerations must be taken into account when selecting a suitable system.

2.3.3 Land fill

A landfill site, also known as a tip, dump, rubbish dump, garbage dump, or dumping ground, is a site for the disposal of waste materials. Landfill is the oldest and most common form of waste disposal. Some landfill sites are also used for waste management purposes, such as temporary storage, consolidation and transfer, or for various stages of processing waste material, such as sorting, treatment, or recycling.

Self-Check – 2	Written test

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Choose the best answer (2pts each)

1. Which one of the following wastes generated during bakery product processing ?
    a. Flour dust
    b. Sugar dust
    c. Unfit batter
    d. Rejected loaves
    e. All

2. Among the listed wastes below which one is packaging waste?
    a. Wrappers
    b. Cardboard boxes
    c. Bags
    d. Burnt cookies
    e. All except “d’

Test II: Short answer questions (2pts each)

1. Write the types waste generated from bakery processing plant?
2. Describe some of the waste treatment methods?

Note: **Satisfactory rating – 8 points** **Unsatisfactory - below 8 points**

You can ask you teacher for the copy of the correct answers.

Score = _____

Rating: _____

Information Sheet 3- Maintaining work area with housekeeping standards

3.1 Introduction

Good housekeeping not only results in a cleaner workplace, but makes it safer as well. Good housekeeping reduces illnesses and injuries and promotes positive behaviors, habits, and attitudes. Employers are responsible for assessing each workplace before work begins to identify the potential hazards present, and determine ways to eliminate the hazards. An effective housekeeping program is an important element in workplace safety and health management systems. To avoid these hazards, a workplace must maintain order throughout a workday.

3.2 Work area requirements

- **Floors and other areas**

Clean up spills such as oil on floors immediately. Floors should be free of debris and accumulations of dust. Areas that cannot be cleaned continuously, such as entranceways, should have anti-slip flooring. Replace any worn, ripped or damaged flooring that poses a tripping hazard. Repair all trap doors and railings. Any equipment or tools not in use should be removed from the work area. Guard floor openings. Trap doors, cages or railings around hay chutes will prevent anyone from accidentally falling into them. Cut down and remove weeds and brush from around buildings. They can hide tripping hazards.

- **Maintain light fixtures**

All buildings and yards should be adequately lighted. Dirty light fixtures reduce essential light levels. Light fixtures in storage areas containing combustible materials should be protected against breaking (i.e. explosion proof fixtures).Maintain lighting evenly, since shadows mixed with light spots inside animal handling facilities will increase the animal's fear and tension.

- **Aisles and stairways**

Aisles and stairways should be clearly marked and kept clear of objects that can cause trips and falls. Aisles should be wide enough to accommodate people and vehicles comfortably and safely. Warning signs and mirrors can improve sight lines at blind corners. Properly arranged aisles encourage people to use them so that they do not take "shortcuts" or "bottleneck" storage. Stairways and aisles also require adequate lighting.

- **Spill control**

The best way to control spills is to stop them before they happen. Regularly cleaning and maintaining machines and equipment is one way to do this. Another is to use drip pans and guards where possible spills might occur. When spills do occur, it is important to follow cleanup procedures as indicated on the Material Safety Data Sheet. Spills must be cleaned up immediately. Absorbent material is useful for wiping up greasy, oily or other liquid spills. Used absorbents must be disposed of properly and safely.

- **Tools and equipment**

Keeping tools neat and orderly can be very important to everyone's safety, whether in the tool room, on the rack, in the yard, or on the bench. Returning tools promptly after use reduces the chance of them being misplaced or lost. Workers should regularly inspect, clean and repair all tools and take any damaged or worn tools out of service.

- **Maintenance**

A good maintenance program provides for the inspection, maintenance, upkeep and repair of tools, equipment, machines and processes. Maintenance involves keeping buildings, equipment and machinery in safe efficient working order and in good repair. This includes maintaining sanitary facilities and regularly painting and cleaning walls, maintaining windows, damaged doors, defective plumbing and broken floor surfaces.

- **Waste disposal**

The regular collection, grading and sorting of scrap contributes to good housekeeping practices. Allowing materials to build up on the floor wastes time and energy since additional time is required for cleaning it up. Placing scrap containers near where the waste is produce encourages orderly waste disposal and makes collection easier. All waste receptacles should be clearly labeled (e.g., recyclable glass, plastic, metal, toxic and flammable etc.) All waste containers should be emptied regularly.

- **Storage**

Stored materials should allow at least one meter (or about 3 feet) of clear space under sprinkler heads. Stacking cartons and drums on a firm foundation and cross tying them, where necessary reduces the chance of their movement. Stored materials should not obstruct aisles, stairs, exits, fire equipment, emergency eyewash fountains, emergency showers, or first aid stations.

- **Fire prevention**

Flammable, combustible, toxic and other hazardous materials should be stored in approved containers in designated areas that are appropriate for the different hazards that they pose. All combustible and flammable material must be present only in the quantities needed for the job and kept in safety cans during use. Oily or greasy rags should be placed in a metal container and disposed of regularly

3.3 Maintaining the work area in housekeeping standards

Proper housekeeping management provides for an orderly arrangement of operations, tools, equipment, storage facilities, supplies, and waste material. Good housekeeping is evidenced by floors free from grease and oil spillage; properly identified passageways; unobstructed accesses and exits; neat and orderly machinery and equipment; well-nested hoses and cords; properly stored materials; removal of excess waste material or debris from the working area; walkways free from ice and snow; surfaces, including elevated locations, free from accumulated dust; and adequate lighting. Maintaining these conditions contributes significantly to lower incident rates.

3.4 Important of good housekeeping practices

Effective housekeeping results in:

- reduced handling to ease the flow of materials
- fewer tripping and slipping incidents in clutter-free and spill-free work areas
- decreased fire hazards
- lower worker exposures to hazardous products (e.g. dusts, vapours)
- better control of tools and materials, including inventory and supplies
- more efficient equipment cleanup and maintenance
- better hygienic conditions leading to improved health
- more effective use of space
- reduced property damage by improving preventive maintenance
- improved morale
- improved productivity (tools and materials will be easy to find

Self-Check – 3	Written test

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Short Answer Questions (2pts each)

1. List at least four work area requirements?
2. Describe the importance of good housekeeping practices?

Test II: Write true if the statement is correct and false if the statement is incorrect (2pts each)

1. Good housekeeping reduces illnesses and injuries and promotes positive behaviors, habits, and attitudes?

Note: **Satisfactory rating – 6 points** **Unsatisfactory - below 6 points**

You can ask you teacher for the copy of the correct answers.

Score = _____

Rating: _____

Information Sheet 4- Conducting work with workplace environmental guidelines

4.1 Conducting work with workplace environmental guidelines

Employees spend almost a quarter of their lives at work, which means workplace environments are a very important part of most people's lives. Working in a safe, healthy environment is important for your physical safety, mental well-being and work productivity. Bad air quality and ventilation, as well as asbestos-riddled structures, can lead to sick building syndrome, which can compromise the health and comfort of your employees. Not only can poor workplace environments reduce productivity, but research has shown they may be linked to asthma, lung cancer and other medical problems. Employers need to take affirmative steps to ensure the health and welfare of their workers. Confronting the problem makes business sense by way of health management savings as well as low absenteeism and contained insurance premiums. To make sure your business is complying with the law, you should consult EPA and OSHA guidelines and follow directives. If necessary, contact an environmental consultant to determine cost effective ways to handle workplace environment issues. Here are three things you can do to combat environmental health issues in the workplace:

- Educate yourself on environmental issues in business to ensure compliance.
- Consult environmental experts to handle health issues in the workplace.
- Train your employees on environmental issues in business.

4.2 Work place environmental guidelines

Checking of work environment should include

- Ventilations
- Lighting
- Noise
- Waste disposing
- OHS hazards

4.3 Health, safety & environmental policy

The Environmental, Health, and Safety (EHS) guidelines are technical reference documents with general and industry-specific examples of Good International Industry Practice (GIIP). These general EHS Guidelines are designed to be used together with the relevant Industry sector EHS Guidelines which provide guidance to users on EHS issues in specific industry sectors. For complex projects, use of multiple industry-sector guidelines may be necessary.

The EHS Guidelines contain the performance levels and measures that are generally considered to be achievable in new facilities by existing technology at reasonable costs. Application of the EHS Guidelines to existing facilities may involve the establishment of site-specific targets, with an appropriate timetable for achieving them.

4.4 Hazard identification in workplace

To identify and assess hazards, employers and workers:

- Collecting and review information about the hazards present or likely to be present in the workplace.
- Conducting initial and periodic workplace inspections of the workplace to identify new or recurring hazards.
- Investigating injuries, illnesses, incidents, and close calls/near misses to determine the underlying hazards, their causes, and safety and health program shortcomings.
- Grouping similar incidents and identify trends in injuries, illnesses, and hazards reported.
- Consider hazards associated with emergency or no routine situations.
- Determining the severity and likelihood of incidents that could result for each hazard identified, and use this information to prioritize corrective actions.

4.5 Implement control measure of hazard

- Design or re-organize to eliminate hazards
- Substitute the hazard with something safer
- Isolate the hazard from people
- Use engineering controls
- Use administrative controls
- Use Personal Protective Equipment (PPE)

Self-Check – 4	Written test

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Short answer questions

1. Write the parameters that should check in the work place environment?
2. Type the implementation control measures of hazard?

Test II: Write true if the statement is correct and false if the statement is incorrect

1. Working in a safe, healthy environment is important for your physical safety, mental well-being and work productivity?

Note: **Satisfactory rating - 6 points** **Unsatisfactory - below 6 points**

You can ask you teacher for the copy of the correct answers.

Score = _____

Rating: _____

Operation Sheet 1– Technique of cleaning bakery equipment

Objective: To clean bakery equipments and maintain the safety requirements of equipment.

1.1 Wear appropriate PPE

Material and tools

- Water hose
- Water
- Brush
- Cleaning agents (detergent, caustic soda, alkaline, acid and hypochlorite)

1.2 Procedures cleaning bakery equipment

Step 1. Pre-rinse/washing

Step 2. Detergent circulation (removal of some of the remaining soil, usually involving heat). This step may be replaced by alkali cleaning

Step 3. Intermediate rinse

Step 4. Additional detergent circulation or acid cleaning

Step 5. Additional intermediate rinse (rinse off the acid and the inorganic soil)

Step 6. Sanitizing/disinfectant rinse (reduce any remaining microorganisms to an acceptable level)

Step 7. Final rinse (removal of the disinfectant to leave only a residue of fresh potable water)

Step 8. Drain

LAP TEST	Performance Test

Name…… ID……Date……

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within **2** hour. The project is expected from each student to do it.

Task 1: perform bakery equipment cleaning operation

LG #22	LO #2- Prepare sponge, cake and cookie batter

Instruction sheet

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- Confirming Ingredients and available for product requirement
- Ingredient storage requirements
- Weighing and/or measuring ingredients
- Checking and confirming equipment
- Setting and operating mixing equipment
- Loading typical ingredients into mixer
- Making batter
- Depositing prepared batter into tins/onto papers

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Confirm ingredients and available for product requirement
- Identify ingredients storage requirements
- Weigh and/or measure ingredients
- Check and confirm equipment
- Set and operate mixing equipment
- Load typical ingredients into mixer
- Make batter
- Deposit prepared batter into tins/onto papers

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below.
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Information Sheet 1- Confirming Ingredients and available for product requirement

1.1. Introduction

A cake is a 'sweet baked' product usually containing flour, sugar, eggs and fat. Other typical ingredients are flavouring agents, liquids and leaveners or raising agents, such as baking powder or baking soda. Cakes are generally categorized by their main ingredient or flavouring. For example:

- Cheesecake
- Chocolate cake or raspberry cake
- Fruit cake. Or by their 'method of preparation
- Mousse cake
- Chiffon cake
- Flourless cake.

Sponges are made from three main ingredients – eggs, sugar and flour, with some containing a small amount of butter as well. Classically made sponges (Genoise) do not contain baking powder or baking soda; their volume and light texture come solely from the air whipped into the egg and sugar solution. Sponge cakes are almost always

- Component of assembled decorated cakes and
- Often a component of plated desserts.

Baking sponge cakes and variations thereof is a basic skill that every cook should master. Not having a properly made sponge affects not only the taste and mouth feel of the product but also its final appearance, as it will be harder to decorate attractively. Sponge cakes are classified by their preparation method, such as the creaming method or foaming method. Sponges that do not contain any leaveners, typically the Genoise type, they should be baked immediately, or the bubbles will start to break. Sponges should be partially cooled before unmolding so that they retain their shape better and also they aren't so fragile when cooled off.

Cookies is a very soft doughs which are deposited directly onto the oven band, High fat and sugar recipes, Long baking times with relatively low baking temperatures, High humidity is required in the first oven zones to allow the dough to spread on the oven band.

1.2. Ingredients of cake, sponges and cookies

i. Flour

The gelatinized starch and coagulated protein provide:

- Body (crumb)
- Structural support
- Protein through coagulation
- Starch through gelatinization

Little or no gluten development is desirable in cake making as it would toughen the cake. However, flour is the major ingredient and it must have some gluten forming properties to give the cake its characteristic structure.

The following ranges of flours are those most commonly used in cake and/or sponge making:

Soft cake flours: are normally used in making cakes, however good results may be obtained using plain flour. Cake flours have lower gluten content (7–8.5%) than other flours. They are finer than other flours and give soft, yielding gluten which does not toughen when mixed.

High-ratio flour, finely milled soft flour, bleached and chlorinated: The bleaching or maturing treatment to which this flour is subjected has a tenderizing effect on the gluten, and the finer grains enable more moisture to be carried in the batter, for instance, emulsified sponge. Due to the lower pH in High Ratio flour the starch gelatinizes at lower temperatures, this could be beneficial in terms of baking times.

Bakers' flour is used in cakes where a stronger structure is required, for example, rich fruit cakes. In European countries, bakers' flour is often mixed with corn flour

or wheaten starch to achieve lower gluten content and create a shorter and finer texture, only use up to half of the quantity of flour.

ii. Fats

- Softens texture of cake
- Shortens the crumb (gluten)
- Improves eating quality
- Improves keeping quality
- Gives improved crust colour
- Assists primary aeration, that is, in the creaming stages for sugar batter or flour batter mixes.

There are various grades and types of cake margarines and shortenings used in cake making, as well as butter. The fat in a cake batter tenderizes the gluten and starch particles, making the crumb moist and tender. It also traps air during the beating process, which aids in the aerating of the batter and the cake. If a High Ratio fat is used it is necessary to also use High Ratio flour to gain the entire benefit to incorporate increased amounts of liquid and sugar into the cake mixture.

iii. Sugar

Icing sugar, Golden Syrup and Honey

Functions of sugar:

- Softens crumb (gluten) and egg proteins
- Sweetens
- Gives crumb whiteness and crust colour
- Assists in aeration
- Aids to keeping qualities (attracts moisture)
- Affects symmetry.

As well as sweetening, sugar has a tenderizing effect on the gluten and egg proteins, resulting in a soft, moist crumb. It also helps to hold moisture in the baked cake, slowing drying and staling.

iv. Eggs

- Moisten
- Aerate
- Bind

Egg also provides:

- ✓ Structure
- ✓ Nutritional value
- ✓ Improved eating quality
- ✓ Improved keeping quality
- ✓ Colour.

Eggs help to form the structure of a cake because of their protein content which coagulates when heated. When the whole egg or egg white is beaten it entraps air which aids in the aerating process. The 'lecithin' in egg yolk acts as an emulsifier of the fat in the batter. Eggs also contribute greatly to colour and flavour. 1 kg of eggs aerates one kg of flour.

v. Liquid

When liquid is used in cakes it is usually some form of milk (liquid whole milk and/or skim milk or full cream/skim milk powder) and water. Liquid helps to bring about the binding of the dry ingredients.

- Affects symmetry
- Increases volume
- Opens texture
- Tenderises

Baking powder is used as an aerating agent in cakes and sponges, particularly where the amount of egg in a recipe or formula has been reduced, resulting in a reduction of the aerating capacity of the batter.

vi. Milk powder

Functions of milk powder

- Lactose, increases sweetness and crust colour
- Increased water content
- Contributes to the flavour
- Assisting in aeration and influencing volume
- Milk-fat enhances the shelf-life of the product. Skim or full cream milk powder can be used.

Generally products made with milk, produce cakes with better volume, better colour and longer keeping qualities, than those with water. In modern cake manufacture where emulsifiers are used, the use of egg produces superior cakes to those made with eggs only. Milk powder should be sieved with the flour and baking powder to ensure even distribution.

vii. Emulsifiers/stabilizers

- Lower ingredient cost possible, due to possibility to lower the egg quantity
- Shorter mixing time
- Better stability of the batter
- Moister sponges
- Better keeping qualities
- Finer and more uniform texture

viii. Salt

- Slight volume increase
- Usage is 1.5% salt based on the egg quantity

ix. Cocoa Powder

Cocoa is added to many recipes to make a chocolate variety of the same product. To produce a chocolate sponge 4% of the flour is replaced with cocoa powder. All cocoa powders contain cocoa butter, and an average would be 25%. Cocoa powder usually replaces flour in such recipes and therefore the balance of the recipe is affected

Self-Check – 1	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Choose the best answer (2pts each)

1. Cakes are generally categorized by their main ingredient or flavouring, these includes.
   a. Cheese cake
   b. Chocolate
   c. Mousse cake
   d. Chiffon cake
   e. All of the above

2. Among the following list of ingredient which one of the following used for baking cake?
   a. Butter
   b. Flour
   c. Milk
   d. Egg
   e. All

Test II: Short answer questions (2 pts each)

1. Write the difference between sponge and cake?
2. List the common ingredients of cake and cookies?

Note: **Satisfactory rating - 8 points** **Unsatisfactory - below 8 points**

You can ask you teacher for the copy of the correct answers.

Score = _____

Rating: _____

Information Sheet 2- Ingredient storage requirements

2.1 Ingredient storage requirements

Baking ingredients have a shelf life, too, as well as the potential spoil and not work as effectively when storage conditions are not ideal. By practicing proper humidity control for baked goods and following storage recommendations, you'll maximize the shelf life of ingredients, reduce waste and ensure the quality of manufactured products.

The rule of thumb for storing baking ingredients that don't require refrigeration or freezing is to place them in an airtight container in an area that's cool, dark and dry. Ideal environments are between 50° and 70° F with a relative humidity level at or below 60 percent. Many ingredients have a shelf life of up to two years, but it's always best to observe a manufacturer's expiration dates.

2.2 Storage tips of common baking ingredients

Keep the following ingredients dry and covered:

- Baking soda
- Baking powder
- Bouillon granules or cubes
- Dry bread crumbs
- Solid chocolate
- Cornmeal
- Cornstarch
- White wheat flour
- Grits
- Powdered milk
- Shortening
- Artificial sweeteners
- Sugar, all types
- Tea, all types
- Marshmallows
- Vinegar
- Baking mixes
- Sauce mixes
- Pudding mixes
- Soup mixes
- Dried vegetables
- Salt
- Whole and ground spices and herbs
- Vanilla and other extracts
- Dry beans and peas

By keeping the following foods refrigerated, even before opening their packaging, you'll extend their shelf life:

- Baked goods
- Cornmeal (freeze for indefinite storage)
- Whole wheat and other whole grain flours
- Molasses
- Dried fruit
- Dehydrated vegetable flakes
- Meat substitutes
- Nuts
- Dry yeas

Refrigerate the following foods after opening:

- Chocolate syrup
- Ground coffee
- Marshmallow cream
- Mayonnaise
- Syrups
- Vegetable oils
- Prepared frosting
- Sauces and condiments
- Parmesan cheese
- Coconut, all forms
- Peanut butte

Part of a baking facility's operations should include regularly monitoring the temperature and humidity of all the locations in which food is stored. To make humidity control for baked goods simpler, use temporary humidity control solutions that include remote monitoring capabilities.

2.3 Importance of humidity control for baked goods

When relative humidity levels are high, dry ingredients absorb the moisture in the air. This affects:

- Weight
- Density
- Cook times
- Ingredient quality
- Shelf life
- Interactions with other ingredients
- Flavors
- Nutritional qualities
- Consumer health

In addition to storage conditions, humidity control for baked goods is important during preparation, baking and cooling stages. When the air lacks sufficient moisture, for example, yeast breads may not rise appropriately. When relative humidity levels are too high when a freshly baked good rests, the food is vulnerable to mold. Problems that result from not having the correct environment for preparing, baking and cooling food affects the efficiency and operations of commercial baking facilities

Self-Check – 2	Written test

Name…… ID……. Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: choose the best answer

1. Among the following storage tips which ingredient is stored under dry and covered environment?
   a. Baking soda
   b. Sauce mixes
   c. Dry bread crumbs
   d. Shortening
   e. All of the above

2. Food ingredients require refrigeration for storage includes,
   a. Dried fruit
   b. Dehydrated vegetable flakes
   c. Meat substitutes
   d. Nuts
   e. All of the above

Test II: Short answer questions (2pts each)

1. What is the importance of humidity control for baked goods?
2. Type the ideal storage environments of baked products?

Note: **Satisfactory rating – 8 points** **Unsatisfactory - below 8 points**

You can ask you teacher for the copy of the correct answers.

Score = _____

Rating: _____

Information Sheet 3- Weighing and/or measuring ingredients

3.1 Weighing and/or measuring ingredients

Baking is a science. It relies on chemical reactions happening between your ingredients. Unfortunately, this means that you can't simply mix up a dollop of this, a pinch of that, a handful of flour and a few eggs, and expect to get the perfect chewy chocolate chip cookie. Baking doesn't work like that (unless you have years and years of experience making your favorite cake recipe). For example, if you add too much butter or not enough flour, your cookies will spread. If you add too much baking powder, your cakes will taste funny, and will rise rapidly and then sink in the middle.

The success in food preparation depends on using the correct amount of ingredients as stated on the recipe. The only way to get the correct amount is by measuring or weighing each ingredient.

Equipment to measure volume includes:

- Measuring spoons
- Dry measuring containers
- Liquid measuring containers
- Scales

3.2 Types of measuring scales

A scale or balance is a device to measure weight or mass. These are also known as mass scales, weight scales, mass balances, weight balances.

i. Traditional scales

- May also be called portion or pound scales.
- Range of capacity is typically 2 to 50 pounds.
- Dials may be fixed (stationary) or adjustable.
- If dial is fixed, place the container on the platform and record the weight of the container before adding ingredients to be weighed.
- If dial is adjustable, place the container on the platform and turn the pointer to 0, then add ingredients until required weight is reached.

ii. Electronic scales

- Need an electric or battery source.
- Range of capacity is typically 10 to 50 pounds.
- The tare button allows you to return the scale to zero weight after placing the container on the scale.
- As an option, place the container on the scale before you turn it on and it will automatically tare to zero.

3.3 The correct ways to measure or weigh ingredients

It is important to follow the correct technique for measuring and weighing. Weigh and measure your ingredients for a recipe before combining. This is your mise in place, meaning all your ingredients are in place before you start preparing and cooking.

i. Measuring Techniques

- Dry ingredients – spoon or scoop ingredient lightly into spoon or cup, and then level top with flat surface.
- Liquid ingredients – fill measuring container and then place container on a level surface. Use your eye to be sure the bottom of the liquid curve (this is called the meniscus) is at the appropriate measure.

ii. Weighing Techniques

- If a fixed dial, weigh the container you plan to use to weigh food. Use a permanent marker to write the weight of the container on the bottom of the container so you do not have to do this step again.
- If an adjustable dial, place container on the scale, then “tare” the scale by moving the dial indicator to the zero mark. If using an electronic scale, simply press the “tare” button to zero the scale.

3.4 Dry measuring cups vs liquid measuring cups

- **Dry measuring cups**

Dry measuring cups are made to be filled to the rim with a dry ingredient (like flour), and then leveled. Sure, you could measure a cup of milk in a dry measuring cup, but filling it to the rim and transferring the liquid to your mixing bowl is awkward to say the least, and you'll probably spill a little along the way. This is when liquid measuring cups come in handy.

- **Liquid measuring cups**

Liquid measuring cups are usually made with a pouring spout and graduated (with volume marks) for easy and clear measuring of liquids. The volume marks on liquid measuring cups always fall well below the pouring spout, making it easier to transfer liquids from cup to bowl. It also means that measuring a dry ingredient, like flour, isn't so easy in a liquid measuring cup because you can't level the contents.

Self-Check – 3	Written test

Name…… ID……. Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Short Answer Questions (2pts each)

1. Write the difference between traditional and electrical weighing scale?
2. Describe some of the measuring equipments of baking ingredients?

Test II: Write true if the statement is correct and false if the statement is incorrect (2pts each)

1. Measuring ingredients has not significant effect on the quality of baked products?
2. The dry measuring of ingredients and liquid measuring can be used interchangeably?

Note: Satisfactory rating – 8 points **Unsatisfactory - below 8 points**

You can ask you teacher for the copy of the correct answers.

Score = _____

Rating: _____

Information Sheet 4- Checking and Confirming Equipment

4.1 Checking and confirming equipment

A bakery inspection checklist helps safety officers and bakery managers inspect machines, equipment, and ovens to ensure that they are being operated and maintained according to Occupational Safety and Health Administration (OSHA's) standard. Use this bakery inspection checklist (derived from OSHA's standard) to proactively check for non-compliance and help keep the facility safe for employees.

4.2 Focus of a bakery inspection checklist

OSHA sets the guidelines to help business owners proactively set safety measures to keep the bakery's day-to-day operations safe for employees. Here are some key points of bakery inspection checklists.

- **Machine**

Machines are required to have appropriate machine guarding to prevent accidents while in operation. Mixers should have manual switches to avoid accidentally turning it on during cleaning and maintenance.

- **Equipment**

The positioning of equipment should be ergonomic and ideal for the operation of employees. Cutting equipment should have covers and other safety measures to avoid unintended slicing.

- **Ovens**

Ovens should have buttons, switches, and circuit breakers that are easily accessible to operators in cases of emergency. Safety devices of ovens should be inspected at least twice a month by an expert and at least once a year by the oven manufacturer's quality representative.

Self-Check – 4	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Short Answer Questions (2pts each)

1. What are the components and equipment checked in the bakery plant?
2. Describe the importance of checking equipment before operating?

Note: Satisfactory rating – 4 points **Unsatisfactory - below 4 points**

You can ask you teacher for the copy of the correct answers.

Score = _____

Rating: _____

Information Sheet 5- Setting and operating mixing equipment

5.1 Setting and operating mixing equipment

Mixing is one of the most critical and important operations in a bakery. The mixing stage allows “inert” dry and liquid ingredients to create a very reactive and dynamic system that can be then processed and transformed into value-added products. Foams, cake batter emulsions, colloidal suspensions and doughs have all one thing in common:

- They are homogeneous mixtures that have a continuous phase and a discontinuous (dispersed) phase.
- Such systems can only be obtained by mixing and bringing their components together.

5.2 Operating parameters during mixing

- **Mixer speed**: the higher the speed, the more blending and work is applied to the system, and the shorter the mix time needed to obtain the desired result.
- **Mixer design:** different arms or attachments provide different mixing patterns that can provide more or less work, shear, strain and stress forces to the mass.
- **Dough size / batter volume in relation to mixer capacity:** mixers are designed to operate below 100% of their capacity but above a certain minimum limit; this is to optimize processing performance.
- **Dough / batter temperature:** mixing implies dissipation or production of heat from the friction between product and mixer wall (especially true with dough processing). The higher the product temperature, the shorter the mixing time should be.
- **Quality of flour:** the stronger the gluten-forming proteins and the greater the protein content, the more mixing time is needed to develop gluten to make it extensible.
    - **Particle size of flour:** the smaller the particle size, the greater the surface area that can be wetted and become hydrated, and the shorter the mix time required for such particles to form a homogeneous mixture.
- **Water absorption of the flour:** excessive water extends clean-up time in dough mixing.

- **Amount and type of reducing and oxidizing agents:** reducing agents decrease the mixing time required to achieve optimum handling properties of bread and bun doughs.
- **Amount of salt, sugar, milk solids, egg solids that compete for the water:** the higher their concentration is, the longer the mixing time will be because there is less water available for gluten development.
- **Degree of aeration:** as cake batter is mixed, more air is incorporated into the emulsified slurry, causing its specific gravity (SG) to decrease. A cake batter takes a certain time to reach a target SG value.

5.3 Types of mixing machines

There are the following common machines used in bakery industry:

- **Spiral mixer:** in which a spiral-shaped mixing tool rotates on a vertical axis.
- **High speed and twin spiral mixer:** where a high level of work can be inputed to the dough in a short time.
- **Horizontal mixer:** where the beaters are driven horizontally within the bowl and fixed to one or two shafts.
- **Low speed:** where mixing is carried out over an extended period of time and the commonly used slow mixing system includes twin reciprocating arm mixer and oblique axis fork mixer.
- **Continuous mixing:** where the ingredients are incorporated at one end of the extruder, and the dough leaves the mixer at the other end in a continuous flow.

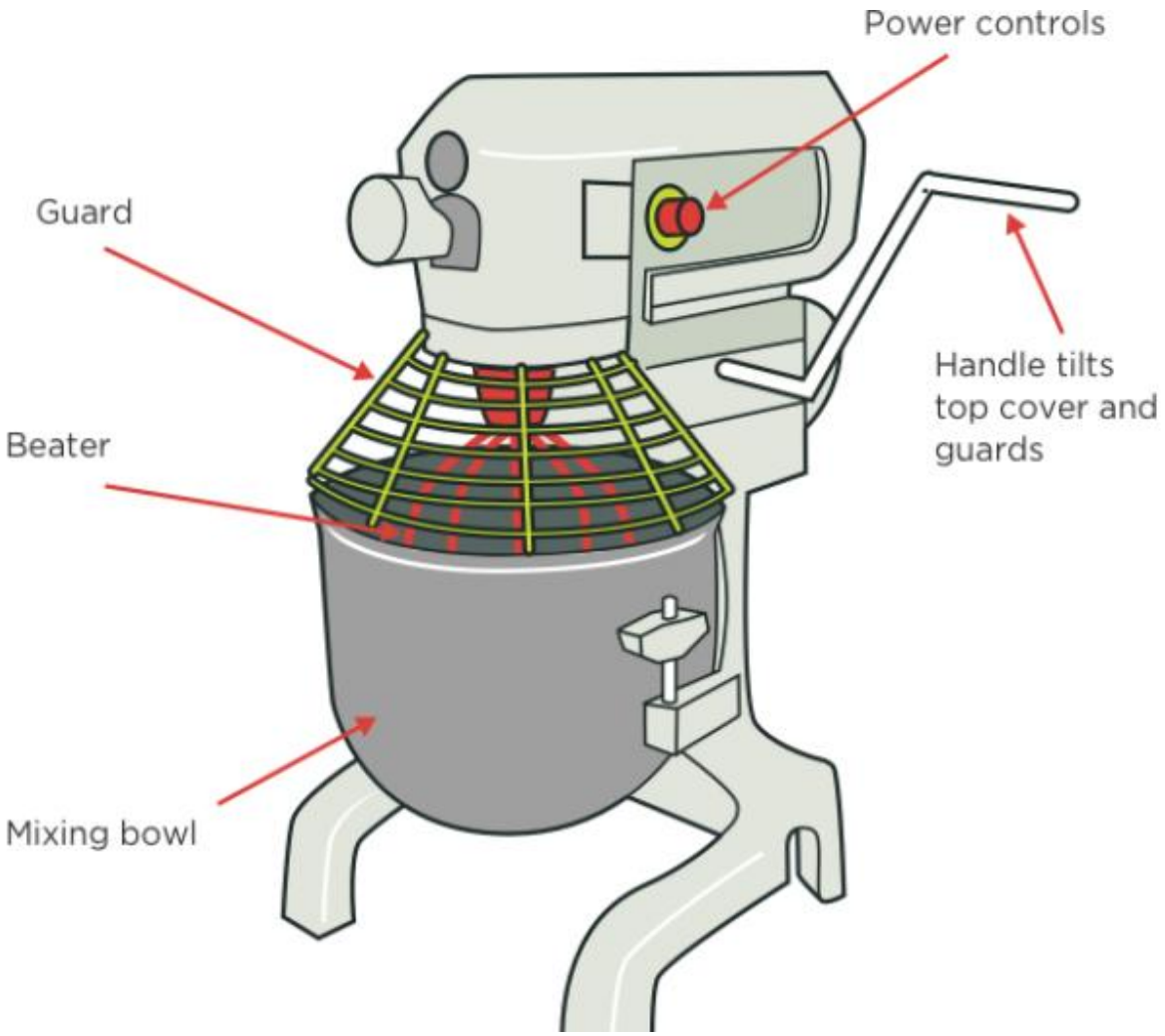


Figure 4. Components of mixer

Self-Check – 5	Written test

Name…… ID……. Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Give short answer (2pts each)

1. What are the operating parameters during batter mixing?
2. List some of mixing machines used in bakery industry?

Test II: Write true if the statement is correct and false if the statement is incorrect (2pts each)

1. The higher the speed, the more blending and work is applied to the system, and the shorter the mix time needed to obtain the desired result.
2. Mixing is one of the most critical and important operations in a bakery.

Note: Satisfactory rating - 8 points **Unsatisfactory - below 8 points**

You can ask you teacher for the copy of the correct answers.

Score = _____

Rating: _____

Information Sheet 6- Loading typical ingredients into mixer

6.1 Loading typical ingredients into mixer

Loading is the transferring mechanisms of bakery ingredients into mixer. There are different tools and equipments used to load ingredients, such as

- Spoon
- Load cell
- Transferring line
- Vacuum pump
- Pressurized pump
- Bowl
- Measuring cylinder

6.2 Typical Ingredients load to mixer

- flour
- sugar
- shortenings and margarine
- eggs
- fruit and flavour enhancing ingredients

Self-Check – 6	Written test

Name…… ID……. Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Short answer questions (2pts each)

1. Write the typical ingredients load in to mixing vat?
2. Describe some of loading equipment?

Note: Satisfactory rating - 4 points **Unsatisfactory - below 4 points**

You can ask you teacher for the copy of the correct answers.

Score = _____

Rating: _____

Information Sheet 7- Making batter

7.1 Making Batter

Batter making is a process in which basic cake ingredients are mixed to form a smooth, aerated and semi-fluid mass that can be poured or deposited into pans. Batter mixing is quite different from dough mixing. This is because the water, fat, sugar and egg levels are much greater in cake than in bread formulations, resulting in a totally different system after mixing.

7.2 Batter Mixing

Batters can be mixed with the same equipment used for bread dough mixing (e.g. vertical mixer, spiral mixer). The only change that is needed is the attachment or beater. Instead of an arm or hook (used to developed gluten), a wire whip and/or paddle are used. These provide a blending and stirring pattern that provides the correct mixing conditions to create the batter.

Mixing time of batter is governed by the extent of air incorporation (aeration). Reaching a given specific gravity (SG) during mixing takes time, and each type of cake requires a batter with a unique SG or aeration level. Batter temperature after mixing should be in the range of 68–72°F (20–22°C). Cold batter temperatures are very helpful during batter mixing for two reasons:

- Lower temperatures provide stability to the batter emulsion by increasing viscosity (shortening becomes thicker at lower temperatures). Higher viscosities create more resistance to the movement of gas bubbles trying to escape from the batter system.
- Lower temperatures increase the solubility of gases dissolved in the batter (according to Henry's Law). This helps retain gas bubbles as much as possible (both air and carbon dioxide released from chemical leavening reactions).

7.3 Ingredient mixing to make batter

7.3.1 Cake batter

Cakes are bakery products that are rich in sugar, fat and eggs, and can be accompanied with a wide variety of inclusions like fruits and flavors such as vanilla extracts.

They represent a very important segment within the baking industry.

- They come in many varieties and are very versatile in terms of flavors, textures, shapes and colors, perfect as snack or as serving size portions on special occasions.
- They are typically made from soft wheat flour characterized by low protein content and high purity (mostly endosperm and starch from center of wheat kernels).

- **Types of cakes**

They can generally be categorized into three types, depending on the differences in formulation, processing conditions and attributes of finished product:

✓ **Batter type:** rely on eggs, flour, and milk for structure, and contain high amounts of fat and water which creates an aerated and chemically-leavened oil-in-water emulsion. Much of the volume of the finished product is created by baking powder. Batter types are classified into:

- Pound cakes (which rely on eggs and fat for leavening, e.g. butter, pound and snack cake)
- Layer cakes (that rely more on chemical leavener, e.g. white layer, yellow layer and chocolate layer cake)

✓ **Foam type:** rely mainly on the extension and denaturation of egg protein for the bulk of the final volume. They can be regarded as “cakes without shortening” given the absence of the oil-in-water emulsion, characteristic of batter systems. Depending on the egg fraction used, foam type cakes are divided into two classes:

- Angel food cake (makes use of egg white proteins to trap air during mixing)
- Sponge cake (makes use of either whole eggs or yolks, or a combination of both)

✓ **Chiffon type:** made with a combination of batter and foam to form a modified "foam-type" grain and texture.

The manufacture of batter, foam and chiffon cakes follows in general the same steps; each type of baked goods has its particular processing conditions and dedicated equipment. The basic steps are:

- Ingredient scaling/metering
- Mixing (target specific gravity or degree of air incorporation depends on the type of product)
- Depositing or panning
- Baking
- Cooling
- Finishing (decoration can be optional)
- Packaging

Mixing methods:

- Single stage (all-in method)
- Creaming method
- Blending method
- Multi-stage method
- Continuous mixing (automated and controlled aeration)

7.3.2 Cookies batter

Cookies are baked treats. A cookie is a small sweet, crispy or cake-like pastry most often made with flour, sugar, liquid and fat. They are characterized by:

- High sugar content
- High fat content
- Low moisture

There are three main stages to cookie batter production:

- **Creaming –** The fat or shortening is creamed with the sugar to entrap air cells and create a fluffy texture. Other ingredients like salt, dry eggs and baking powder are also added at this stage to improve homogenization of the dough.
- **Incorporation of liquids** – The addition of liquids at this stage helps disperse and homogenize the dough, and aeration continues.
- **Incorporation of dry ingredients** – The last stage of flour addition, or folding in of the flour, gently introduces the flour into the dough without destroying the air cells. Adding flour at the last stage also prevents a gluten matrix from forming, thereby producing a short bite for the cookie. This results in a short bite for the cookie.

Cookies are produced according to varied formula compositions, in many different shapes and sizes, and by various manufacturing procedures. The main components are flour, water, fat, sugar and chemical leavening.

https://www.unifiller.com/bakery-application/cake-batter

Self-Check – 7	Written test

Name…… ID……. Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Choose the best answer

1. Cookies batter can be characterized by
    a. High sugar content
    b. High fat content
    c. Low moisture
    d. All

Test II: Short answer questions (2pts each)

1. Write the common types of cake?
2. Describe the mixing methods of batter?

Test II: Write true if the statement is correct and false if the statement is incorrect (2pts each)

1. Mixing time of batter is governed by the extent of air incorporation or aeration.
2. Batter mixing is quite different from dough mixing

Note: Satisfactory rating - 10 points **Unsatisfactory - below 10 points**

You can ask you teacher for the copy of the correct answers.

Score = _____

Rating: _____

Information Sheet 8 - Depositing prepared batter into tins/onto papers

8.1 Depositing batter into tins/onto papers

The main goals of depositing batters and fillings are always accuracy and maintaining product integrity. We have to make sure that have in place better control of the deposit weights. For accurate depositing of dense or aerated mixes, batters and doughs, look no further than axis bakery depositing and filling equipment.

Batter in muffin pans, cookies on trays, layers of cream on cakes the applications for axis depositing systems are endless. Deposit a wide variety of viscosities with ease. Batters that contain small particulates like nuts, chocolates, berries or candied fruits are no problem with axis dough and batter depositing technology. Add on a wide range of accessories, such as twisting nozzles, guillotines, wire-cut attachments, press rollers, decorating rollers and more to suit your unique product. Move vertically, horizontally or both to target continuously moving or intermittent production lines. Depositors can be fitted over an existing oven band or designed as a turnkey mobile unit with its own conveyor. Axis depositing systems are flexible by design.

Figure 5. Depositor

Self-Check – 8	Written test

Name…… ID……. Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Short Answer Questions

1. What is the main function of depositor?

Note: Satisfactory rating – 2 points **Unsatisfactory - below 2 points**

You can ask you teacher for the copy of the correct answers.

Score = _____

Rating: _____

Operation Sheet 1– Technique of batter making

Objective: To produce quality cake batter using different mixing techniques

PPE

- Glove
- Mask
- Guan
- Safety shoes
- Heat resistant glove

Equipments and ingredients

- Water
- Egg
- Flour
- Fat
- Milk
- Sugar
- Salt
- Vanilla
- Mixing bowl
- Loading cell

1.1 Procedures of sugar batter method

Step1. All the fat is creamed until it gets light white color

Step2. Add sugar gradually

Step3. Continuing the creaming process. When adequate aeration is achieved, the fat & sugar mixture will be light & brighter in appearance.

Step4. Add beaten eggs gradually into the mixture.

Step5. Eggs should be added into the batch wise. If more eggs are added at a time, it will curdle. Other liquids can be added at this stage.

Step6. Fold the prepared fruits into the mixture.

Step7. Add sieved flour into the mixture. After adding the flour, if the batter is very stiff, add some quantity of water

Step 8. Milk to adjust the batter consistency

1.2 Procedures of flour batter method

Step 1. Cream the fat & a quantity of flour not exceeding the weight of fat till it becomes light & fluffy. At the same time in other machine, beat the egg & equal quantity of sugar, till it becomes stiff & frothy.

Step 2. Add this mixture into the first mixture. At this stage, second mixture should be added in small quantity at a time. It should be mixed thoroughly & then only the next portion should be added.

Step 3. The remaining sugar is dissolved in milk or water & added to the mixture. Any color or flavor is added along with this liquid.

Step 4. Lastly the remaining flour is sifted with chemicals & mixed.

Caution: This method is suitable for lean cakes. Because lean cakes acquire most of the aeration due to baking powder & there is no risk of losing aeration achieved in fat.

1.3 Procedures blending method

Step 1. Wipe together fat, flour, baking powder & salt till it comes to a very light & fluffy condition.

Step 2. Mix together sugar, milk or any other liquids, color & essence & add into the previous mixture.

Step 3. Add eggs & mix the whole mass to a smooth batter

Caution: This method is suitable for high ratio cakes. High ratio cake means the quantity of sugar is more than the quantity of flour.

1.4 Procedures of boiled method batter making

Step1. Heat butter or fat is with water till it reaches the boiling point.

Step 2. Remove from the fire & add 2/3 of flour & mix it thoroughly.

Step 3. Beat the eggs & sugar until it becomes stiff & add color & essence.

Step 4. Add this mixture is into the previous mixture gradually. It is mixed thoroughly & remaining flour can be add at this stage.

Caution: This method is used for making Madeira cake & Genoese sponge

1.5 Procedures of sugar water method

Step 1. Agitate all the sugar & half the quantity of water in a bowl till all the sugar is dissolved.

Step 2. Add the remaining ingredients, except egg & well agitate the mixture to achieve aeration.

Step 3. Add egg & the mixture is cleared. Due to more aeration & better emulsification obtained in this method, the cakes so produced have better texture & longer shelf life.

1.6 Procedures of all in one process batter making

Step 1. All the ingredients are mixed together into the mixing bowl.

Step 2. Aeration of the mixture is achieved by controlling the speed of the mixture as well as mixing time.

Step 3. Wire whip is used for this method, because it ensures a faster break down of ingredients & it helps to achieve good aeration

Step 4. After adding all ingredients in mixing bowl, mix on slow speed for one minute, then high & medium speed for two minutes & again on slow speed for one minute

Caution: This method is mainly used for gel sponge. If the formula contains oil it should be added in the last stage.

1.7 Procedures of foaming method

Step 1. Beat the egg till it becomes fluffy & frothy. During beating, the small air cells are incorporated into the mixture. This air incorporation helps to increase the volume.

Step 2. Add sugar gradually in continuous beating till it becomes thick & creamy. Essence & color can be added at this stage.

Step 3.The flour should be sifted with baking powder & added with just necessary movements of hand without disturbing the foam.

Caution: If you give rough folding or uneven mixing, the incorporated air will escape. Then the finished product will be of very poor quality & flat one.

LAP TEST	Performance Test

Name…… ID……Date……

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within **8** hour. The project is expected from each student to do it.

Task 1: Perform procedures of sugar batter method

Task 2: Perform procedures of flour batter method

Task 3: Perform procedures of blending method batter making

Task 4: Perform procedures of Boiled method of batter making

Task 5: Perform sugar water method of batter making

Task 6: Perform all in one process batter making

Task 7: Perform Foaming method batter making

LG #23	LO #3- Prepare to bake product

Instruction sheet

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- Selecting baking parameters
- Tinning or depositing batter and ready for baking
- Standard of recipes and desired product characteristics
- Preparing variety of products
- Selecting suitable ingredients
- Making and ensuring products using correct techniques to optimize quality
- Using appropriate equipment to produce cakes
- Selecting required oven temperature and baking cakes
- Ensuring the desired characteristics of cake

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Select baking parameters
- deposit batter and ready for baking
- Standard of recipes and desired product characteristics
- Prepare variety of products
- Select suitable ingredients
- Make and ensure products using correct techniques to optimize quality
- Use appropriate equipment to produce cakes
- Select required oven temperature and baking cakes
- Ensure the desired characteristics of cake

Learning Instructions:
1. Read the specific objectives of this Learning Guide. 2. Follow the instructions described below. 3. Read the information written in the information Sheets 4. Accomplish the Self-checks 5. Perform Operation Sheets 6. Do the “LAP test” back to “Operation sheets

Information Sheet 1- Selecting baking parameters

1.1 Introduction

Baking together with rising is the most important phase of the bakery process, because it affects the sensorial and nutritive characteristics, appearance and shelf life of the product. Visually, this process occurs with the increase in volume and solidification of the dough. The baking process takes place in the oven with the development of an exothermic reaction, i.e., with production of heat, with many variables in play. The product must appear perfectly risen and not overcook. It also should respond to visual characteristics and taste, defined on the expectations of the end customer. These qualitative features must be connected also to an adequate production capacity, according to the type of product to be processed. In the specific case we considered the bakery process of some products for seasonal recurrence, which are produced and sold in a limited period of time close respectively to Christmas and Easter. Sweet bakery products can be realized using several type of oven.

2.1 Baking parameters

2.1.1 Temperature

The mean temperature of the cooking chamber is controlled automatically by means of a temperature controller and a thermocouple placed inside the cooking chamber. The temperature sensor is used by the controller to monitor the chamber temperature and to drive the burner accordingly in order to maintain the set point value. Any over temperature activates light and audible alarm; moreover, in the case of extremely high temperatures, the burner is switched off.

2.1.2 Baking time

It depends on the speed of the conveyor belt, which is set by a potentiometer installed on the control panel of the conveyor and acts directly on the motor speed. The operator, depending on the recipe to be performed, can vary the speed of the conveyor and thus increasing or decreasing the cooking time. Bake time is governed by the timing of thermal events and baker's experience. It should only be established via thermal profiling and not by how the crust looks. In continuous ovens, bake time is controlled by conveyor speed.

2.1.3 Position of the shutters

The amount of combustion gases is distributed across the ceiling and the bedplate thanks to two shutters placed on the return manifold. Modifying the position of the shutters from open to close it is possible to decrease the flow of fumes inside the bedplate heating pipes, thus varying the distribution of heat between ceiling and bedplate

2.1.4 Steam flow rate to extract

The extraction system of the steam is forced and consists of a series of outlets of variable section located in the upper part of each cooking chamber. The outlets are connected to a duct, through which the steam is conveyed to an extraction chimney with regulation shutter and fan. After the exit of product from the cooking chamber, an additional fan on the final suction hood collects the residual steam and avoids leaking of product's gases in the working environment.

2.1.5 Dough strength

This factor represents the rising capability of a specific kind of flour in dough, tested in different conditions. This property is related to the content of proteins, in particular of gliadin and glutenin, which together comprise the gluten. Stronger flours tend to absorb a greater quantity of water in the mixture and make it more resistant and tenacious. These features allow a greater resistance to rising thanks to a more solid mesh because of gluten, thus avoiding the doughs deflation and improving the final quality of the product.

2.1.6 Air velocity

The term air velocity implies the flow of hot air inside the baking chamber, usually expressed in m/sec. In a convection oven, air velocity directly controls the amount of heat delivered to the product. It also influences the baking time, weight loss as a consequence of water extraction, and color of baked products. Even distribution of airflow across the width of the oven chamber is vital for even heat distribution and optimum product bake. The higher the air velocity, the faster the product loses water and hence the shorter the bake time needed to achieve full bake.

2.1.7 Heat flux

Heat flux is the amount of energy transferred per unit area per unit time from or to a surface. It has three components: radiation, convection and conduction. It can be

expressed in W/m^2. Both the total amount of heat flux and the ratios of the three components influence the baked product's quality. This parameter is probably less commonly measured. It's controlled on a real-time basis in the normal operation of a high-speed oven. However, it is very important during the oven design phase, such as prior to equipment onsite commissioning.

In pan bread production, convective and radiant heat is absorbed by the pan, which also serves as the conduction mechanism to the product. It can be said that heat flux is a direct consequence of how the heating mechanisms work. For example, ribbon burners in direct gas-fired ovens.

2.1.8 Humidity

Oven humidity influences moisture migration from the product's interior to its surface and thus, evaporation. Drier oven conditions promote faster water extraction due to increased mass transfer moisture gradient. Humidity inside the baking chamber can be expressed as % moisture by volume or as absolute humidity mass ratio (lb water/lb dry air or kg water/kg dry air).

Self-Check – 1	Written test

Name…… ID……. Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I : Choose the best answer

1. Which of the following the baking parameters of cake and cookies?

a. Temperature

b. Time

c. Humidity

d. All

Test II: Give short answer

1. Write at least three baking parameters of cake and cookies?

Test III: Write true if the statement is correct and false if the statement is incorrect (2pts each)

1. Oven humidity influences moisture migration from the product's interior to its surface.

2. Heat flux is the amount of energy transferred per unit area per unit time from or to a surface.

Note: Satisfactory rating - 8 points **Unsatisfactory - below 8 points**

You can ask you teacher for the copy of the correct answers.

Score = _____

Rating: _____

Information Sheet 2- Tinning or depositing batter and ready for baking

2.1 Tinning or depositing batter and ready for baking

The oven depositor applies the batter directly to an oven band with speeds up to different depositor rows per certain minute. Once the batter is transferred onto the depositor apron, it will be conveyed underneath a traveling depositor head. This depositor head is mounted onto a traveling platform plate which is capable of hosting up to two Deposit manifolds. When the deposit function is enabled, the Deposit Manifold actuator shaft will be activated and the manifold will begin to dispense filling onto the biscuit. The biscuit will continue to travel to the exit end of the conveyor until it is discharged onto the oven band conveyor

The Moving materials around a manufacturing facility can allow opportunities for contamination. Materials such as ingredients, work-in-progress, and finished goods should be part of an operational method procedure. Stored materials may need to be sampled by QC before use in manufacturing. Sampling of materials must be done in accordance with a defined sampling protocol that includes sanitation of sampling tools, marking of compromised containers, and resealing. The most common storage containers are bags, boxes, pails, and drums. Protocols should be established for each type of container.

https://youtu.be/gfo-6J57mTA (oven depositor)

Self-Check – 2	Written test

Name…… ID……. Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Give short answer

1: Discuss on tinning and depositing mechanisms of batter? (2pts)

Note: Satisfactory rating - 2 points **Unsatisfactory - below 2 points**

You can ask you teacher for the copy of the correct answers.

Score = _____

Rating: _____

Information Sheet 3- Standard of recipes and desired product characteristics

3.1 Standard of recipes

A standardized formula or recipe is a set of instructions describing the way a particular establishment prepares a particular item. In other words, it is a customized recipe developed by an operation for the use of its own cooks, pastry chefs, and bakers, using its own equipment, to be sold or served to its own patrons. Formula formats differ from operation to operation, but nearly all of them try to include as much precise information as possible. The following details may be listed:

- Name of the recipe
- Yield, including total yield, number of portions, and exact portion size
- Ingredients and exact amounts, listed in order of use
- Equipment needed, including measuring equipment, pan sizes, portioning equipment, and so on
- Directions for preparing the dish kept as simple as possible
- Preparation and cooking times
- Directions for holding the product between preparation and service
- Directions for portioning, plating, and garnishing
- Directions for storing leftovers

Product Standards a key tool to assure quality in a finished processed food is the product standard document. Product standards define the food by physical, chemical and microbiological characteristics. Appearance, aroma, flavor and texture can and should also be considered for product standards. Physical characteristics include size, shape, dimensions, weight, volume, count per package or container, presence of fines, or any other special features which define the particular food. Moisture, fat, protein, ash, fiber and carbohydrates are the basic chemical characteristics.

Additional chemical criterions such as salt, sodium, cholesterol, etc., are used to chemically define food products. Chemical standards are necessary when using nutritional labeling or making label claims for low sodium, higher fiber or other nutritional facts. Microbiological standards will be dependent upon the specific food item. First consider food poisoning organisms when developing product standards for a quality control program.

If the food product will support the growth of a potential food poisoning organism, identify the particular organism in the critical standards category as opposed to a major or minor standard. Some typical food poisoning organisms are Salmonella, Clostridium botulinum, Staphylococcus aureus and Clostridium perfringens. Other microbiological standards such as a standard plate count (SPC), yeast or mold may be appropriate for classification as major or minor standards.

The sensory properties of a food product are keys to the consumer acceptance. Flavor, texture, aroma and appearance are criterion that should be defined to assure that the product meets design expectations. Qualitative measures of sensory properties can be costly due to requirements for sophisticated equipment. Qualitative testing using taste panels, is an alternative to quantitative measurements. Make a sensory evaluation for flavor, odor and texture a part of a quality control program. Establish a reject level for each product standard along with acceptable methodology. Base minimum reject levels upon regulatory requirements and practical production experience.

3.2 Functions of standardized formulas

An operation's own recipes are used to control production. They do this in two ways. They control quality. Standardized formulas and recipes are detailed and specific. This is to ensure the product is the same every time it is made and served, no matter who cooks it. They control quantity. First, they indicate precise quantities for every ingredient and how to measure that quantity. Second, they indicate exact yields and portion sizes and how to measure and serve those portions.

3.3 Ingredient specifications

The quality of the finished food product after manufacture depends on the quality of the raw materials and ingredients. The best starting point for developing ingredient specifications is the supplier. Custom specifications from suppliers are possible. The ingredient specifications should be documented in a form consistent with the processor's needs.

Ingredient specifications document should include:

- Name of ingredient
- Internal code number
- Effective date

Basic description of ingredient specifications categorized as:

- Critical
- Major
- Minor
- Action and reject levels
- Ingredient statement

The prepared ingredient specifications become a tool for control. The information under each heading should be simple but informative. It is simple and informative. The basic description is short and to the point. Critical specifications include two items associated with public safety. Critical specifications can also include factors influencing wholesomeness or legality. Action levels are used as a reference point to identify a potential problem. If the ingredient consistently reaches action levels, notify your supplier. The reject level is the point of refusing delivery of the ingredient. The ingredient statement for the raw material is a reference point to assure that the supplier has not changed the material. The final key point for ingredient specifications is for the supplier to know and agree to the content of the document.

3.4 Limitations of standardized formulas

Standardized formulas have the same problems as all recipes those discussed earlier regarding variations in ingredients, equipment, and vagueness of instructions. These problems can be minimized by writing the recipe carefully, but they cannot be eliminated. Even if an operation uses proven, standardized recipes, a new employee making a dish for the first time usually requires some supervision to make sure he or she interprets the instructions the same way as the rest of the staff. These limitations don't invalidate standardized recipes. If anything, they make exact directions even more important. But they do show that experience and knowledge are still very important.

3.5 Desired Characteristics

The look of the product is the first stimulation that attracts a purchaser for the first time. Other characteristics might be:

- Colour
- Mouth feel
- Moisture content
- Eating properties.

Many varieties are available out in the market place but all will come from their base English pound cake formula derivations of butter and Madeira cake styles.

Self-Check – 3	Written test

Name…… ID……. Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Choose the best answer (2pts each)

1. Ingredient specifications document should include
    a. Ingredient name
    b. Internal code number
    c. Effective date
    d. All

Test II: Give short answer (2pts each)

1. Write the desired characteristics of product?
2. The basic description of ingredients specification?

Test III: Write true if the statement is correct and false if the statement is incorrect

1. Appearance, aroma, flavor and texture can and should also be considered for product standards.
2. The quality of the finished food product after manufacture depends on the quality of the raw materials and ingredients.

Note: Satisfactory rating – 10 points **Unsatisfactory - below 10 points**

You can ask you teacher for the copy of the correct answers.

Score = _____

Rating: _____

Information Sheet 4- Preparing variety of products

4.1 Varieties of cake

Different cake products are processed in the bakery industry. The difference might be in the processing steps, ingredient mixes as well as physicochemical properties.

- **Sponge cake**

Sponge cake is one of the oldest known sweet goods. Along with angel food cake, it belongs to the category of “foam cakes.” It’s very popular around the world, probably because of their short list of ingredients. This type of cake is often used as the base of other desserts such as snack cakes, jelly rolls, Swiss rolls and Tres Leches. A basic sponge cake is composed of only four essential ingredients:

- ✓ Cake flour
- ✓ Eggs (whole or yolks)
- ✓ Granulated sugar
- ✓ Salt

Figure 5. Sponge cake

- **Pound cake**

Pound Cake is white, dense, and is perhaps one of the most simplest and well-known cakes. Although traditionally it is plain, it is easy to find many flavored, lighter varieties

today. A pound cake is usually baked in loaf form or in a Bundt pan. The simplicity and density of the cake makes it a popular sidekick with fruit or whipped cream. A shortened cake, it has tight grain and elastic crumb. Pound cake is often flavored with citrus fruits or vanilla. Sour cream is another new addition to the recipe. It can be topped with a light icing, glaze or dusted with powdered sugar. However, it is rarely heavily frosted.

Figure 6. Pound cake

- **Butter cake**

Butter cake is considered the quintessential American cake. Variations of it are often served at weddings and birthdays. The most common forms are white and yellow cake. Both are fairly simple and contain flour, eggs, butter, sugar, sometimes salt, and a chemical leavening pair.

In the U.S. butter cake is often referred to as pound cake.

- ✓ Flavorful
- ✓ Soft and light in texture
- ✓ Moist enough to stand on its own or to accommodate a variety of frostings and toppings

Figure 7. Butter cake

- **Chiffon cake**

A chiffon cake is a sweet baked good which combines a batter with a foam-type (sponge) cake. This type of cakes combine the richness of batter cakes such as high content of liquid whole eggs, fat and granulated sugar and the lightness and delicacy of angel food or sponge cakes.

- ✓ It is unusually tender and moist with superior keeping quality.
- ✓ These cakes are well known for their tall structure, light, soft and tender, springy texture.

A chiffon cake should be light and fluffy with an open, “chiffon” grain, and a delicate flavor. In chiffon cakes, the batter is aerated by whipping high amounts of whole eggs, often enriched with extra egg yolks, into light and fluffy foam. Small amounts of melted butter or vegetable oil are often incorporated into the aerated batter to produce a more tender cake structure.

Figure 8. Chiffon cake

- **White layer cake**

White cake is a simple one, featuring a fine, moist crumb. It is commonly used for weddings, birthdays and other special occasions.

- ✓ It is made like most plain cakes, but the big difference is egg whites are used.
- ✓ This gives white cake its characteristic pure-white coloring. It is a shortened cake, meaning it uses fat as a main ingredient and is leavened with baking powder.

Figure 9. White layer cake

- **Yellow cake**

Yellow Cake owes its familiar golden hue to a recipe containing whole eggs and butter. These ingredients are responsible for making yellow cake rich and dense. It is a high ratio cake (high percentage of sugar to flour).

- ✓ The texture or crumb of yellow cake is moist and tender with an even grain
- ✓ It has a vanilla flavor with buttery notes
- ✓ It holds up well to layering and frosting

Figure 10. Yellow cake

4.3 Varieties of cookies

Cookies are baked treats. A cookie is a small sweet, crispy or cake-like pastry most often made with flour, sugar, liquid and fat. They are characterized by:

- ✓ High sugar content
- ✓ High fat content
- ✓ Low moisture

There are three main stages to cookie dough production:

- ✓ **Creaming** – The fat or shortening is creamed with the sugar to entrap air cells and create a fluffy texture. Other ingredients like salt, dry eggs, and baking powder are also added at this stage to improve homogenization of the dough.
- ✓ **Incorporation of liquids** – The addition of liquids at this stage helps disperse and homogenize the dough, and aeration continues.
- ✓ **Incorporation of dry ingredients** – The last stage of flour addition, or folding in of the flour, gently introduces the flour into the dough without destroying the air cells. Adding flour at the last stage also prevents a gluten matrix from forming, thereby producing a short bite for the cookie. This results in a short bite for the cookie.

Cookies are produced according to varied formula compositions, in many different shapes and sizes, and by various manufacturing procedures. The main components are flour, water, fat, sugar and chemical leavening.

Self-Check – 4	Written test

Name…… ID……. Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Short answer question

1. Write at least four variety of cakes and there characteristics?
2. Type the common characteristics of cookies?

Test II: Write true if the statement is correct and false if the statement is incorrect (2pts each)

3. A cookie is a small sweet, crispy or cake-like pastry most often made with flour, sugar, liquid and fat.
4. White layer cake is commonly used for weddings, birthdays and other special occasions.
5. A chiffon cake is a sweet baked good which combines a batter with a foam-type (sponge) cake

Note: Satisfactory rating – 10 points **Unsatisfactory - below 10 points**

You can ask you teacher for the copy of the correct answers.

Score = _____

Rating: _____

Information Sheet 5- Selecting suitable ingredients

5.1 Common suitable ingredients for cake and cookies

- Cake flour
- Eggs (whole or yolks)
- Granulated sugar
- Salt Flavorful
- Soft and light in texture
- Variety of frostings and toppings
- vanilla flavor with buttery notes
- layering and frosting
- High sugar content
- High fat
- Low moisture

Self-Check – 5	Written test

Name…… ID……. Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test: give short answer

1. Write the common ingredients of cookies and cake? (3pts)

Note: Satisfactory rating - 3 points **Unsatisfactory - below 3 points**

You can ask you teacher for the copy of the correct answers.

Score = _____

Rating: _____

Information Sheet 6- Making and ensuring products using correct techniques to optimize quality

6.1 Making and ensuring products quality using correct techniques

- **Sugar batter method**

The fat and sugar are creamed together until light and fluffy. The warmed egg is added in intervals (small additions) into the mixture, ensuing that with each addition the fat mixture is well creamed and not separated. The conditioning of the egg is very important as curdling of the batter can occur at this stage (mostly due to too cold egg). Curdling is the breakdown of the emulsion, which is being formed, as the fat separates out from the liquid. The egg should be warm, but these are the consequences if the temperature is incorrect:

- Egg too cold: the fat hardens, air escapes and the mix curdles
- Egg too warm: the fat turns to oil, the air escapes and the mix curdles
- Egg added too fast: the mix becomes saturated, the air escapes and the mix curdles.

It may also be possible to add the eggs in a steady stream; care must be taken not to curdle the mixture.

- The batter should have a soft and velvety texture, after all egg is added
- The flour is sifted and gently mixed through the batter, until it is clear and smooth

- **Flour batter method**

The fat is mixed with one third of the sifted flour until it is well creamed (around 8 minutes), ensuring that the entire batter is aerated by scraping the bowl down. The egg and sugar is whisk to a foam (sponge), using a separate bowl. Egg and fat need to be of the same temperature and consistency before they are combined. Add some of the egg mixture into the fat to adjust consistency. Carefully fold into the fat mixture the following: remainder of eggs, sifted flour and baking powder and lastly the liquid. Each ingredient needs to be cleared in the batter, before adding the next ingredient. In order to avoid any lumps it is vital to follow the sequence.

- **The Blending method**

The Blending method does not require aeration or creaming of the fat with the sugar or the flour. The aeration of the batter takes place towards the end of the mixing cycle, rather than being the first step, as in the sugar or flour batter methods. One of the reasons for this is that the formula or recipe contains a high level of added liquid in the form of milk, which replaces some of the egg. Due to the lower egg content, it would not be possible to make up the batter using conventional methods, and gain sufficient aeration.

6.2 Quality characteristics of good cake

Characteristics of cakes can be classified as internal and external characteristics. The external characteristics include volume, crust colour, symmetry of form and character of crust. The internal characteristics include grain, crumb colour and sensory parameters such as taste, aroma and texture. External characteristics

- **Volume:** It depends on consumer preference. It should be well risen with slight convex top surface and should not appear too small or too large for its weight.

- **Crust colour**: Pleasing golden brown colour is desirable. Too dark or too light or dull colour is not desirable. Crust must have a uniform colour, free from dark streaks or sugar spots or grease spots.

- **Symmetry of form**: Cakes should have symmetrical appearance. Peaking, crack on top surface, low sides, sunken or high center, burst, caved in bottom or uneven top are undesirable characteristics of cakes.
- **Character of crust**: Crust should be thin and tender. It should not be rubbery, sticky or over moist, too tender, tough or busty crust indicates poor quality of cakes.
- **Grain**: The grain is the structure formed by the extended gluten strands including the area they surround. Grain will vary according to type of cake. Uniformity of the size of cells and thin cell walls are desirable qualities. Coarseness, thick cell wall, uneven size of grains, large holes and tunnels are indicative of poor grain. Grains should not be too open or too close.

- **Colour of Crumb**: It should be lively, lustrous and uniform colour. It should be free from any streaks or dark patches. Grey, non uniform, dark, light or dull colour crumb are undesirable
- **Aroma**: Pleasant, rich, sweet and natural aroma is desired. Flat, misty, strong or sharp aroma is indicative of poor quality of cake
- **Taste:** It should be pleasant, sweet and satisfying without any after taste or foreign taste. Salt and soda in excessive amounts affect the taste adversely.
- **Texture**: Texture denotes the pliability and smoothness of the crumb as felt by sense of touch. It depends on the physical condition of crumb and type of grain. A good texture is soft and velvety without weakness and should not be crumby. Rough, harsh, too compact, lumpy or too loose texture is not

Self-Check – 6	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Give short answer (2pts each)

2. Write the different cake production methods?
3. Describe the flour batter method procedures?

Note: Satisfactory rating - 4 points **Unsatisfactory - below 4 points**

You can ask you teacher for the copy of the correct answers.

Score = _____

Rating: _____

Information Sheet 7- Using appropriate equipment to produce cakes

7.1 Equipment used to produce cakes

Baking equipment is the complete package of baking tools and utensils which are necessary for baking a fantastic cake. Baking must not have to be a complicated task, despite that, the cake baking gadgets makes the process simpler and a lot more fun.

7.2 Classification of baking tools and equipment

- **Ovens**
  - ✓ Convection Ovens
  - ✓ Rotary Ovens
  - ✓ Microwave Oven
  - ✓ Deck or Cabinet

Mixing tools mixing bowls

- ✓ Rotary Egg Beater
- ✓ Wooden Spoon Rubber Scrapper
- ✓ Electric and Handy Mixer

- **Other baking equipment**
  - ✓ Dutch Oven
  - ✓ Double Broiler
  - ✓ Bread Toaster

- **Cutting tools pastry blender pastry wheel**
  - ✓ Dough cutter
  - ✓ Shears
  - ✓ Chopping Boards
  - ✓ Paring Knife

- **Preparatory tools**
  - ✓ Utility Tray
  - ✓ Grater
  - ✓ Pastry Brush
  - ✓ Spatula
  - ✓ Flour Sifter

- ✓ Rolling Pin
- ✓ Pastry Cloth
- ✓ Pastry Tips

- **Baking pans**

  - ✓ Tube Center Pan
  - ✓ Muffins pan
  - ✓ Cake Pans
  - ✓ Jelly Roll
  - ✓ Pan Bundt Pan
  - ✓ Custard Cup
  - ✓ Griddle Pans Pop
  - ✓ Over Pans
  - ✓ Macaroons Molders
  - ✓ Baking Sheet

- **Measuring tools**

  - ✓ Measuring Cups
  - ✓ Measuring Spoons
  - ✓ Weighing Scale
  - ✓ Liquid Measuring

Self-Check – 7	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Short answer question (2pts each)

1. Write at least four preparatory tools and equipments baking equipments?
2. Type three different types of baking oven?
3. Describe common baking tools and equipments?

Note: Satisfactory rating - 6 points Unsatisfactory - below 6 points

You can ask you teacher for the copy of the correct answers.

Score = _____

Rating: _____

Information Sheet 8- Selecting required oven temperature and baking cakes

8.1 Oven temperature for baking cakes

Table 2. Baking temperatures and times of different bakery product

	Temp (F/C)	Minutes
Breads		
Biscuits	425 - 450 F 218 - 232 C	10 - 15
Cream Puffs	375 F 190 C	60
Popovers	375 F 190 C	60
Quick Loaf Breads	350 - 375 F 177 - 190 C	60 - 75
Yeast Bread	400 F 205 C	30 - 40
Yeast Rolls		
Plain	400 - 425 F 205 - 218 C	15 - 25
Sweet	375 F 190 C	20 - 30
Cakes With Fat		
Cupcake	350 - 375 F 177 - 190 C	15 - 25
Layer Cake	350 - 375 F 177 - 190 C	20 - 35
Loaf Cake	350 F 177 C	45 - 60
Cakes Without Fat		
Angel Food & Sponge	350 F 177 C	50 - 60
Cookies		
Drop	350 - 400 F 177 - 205 C	8 - 15
Rolled	375 F 190 C	8 - 10
Pastry		
1 Crust Pie (Custard Type)	400 - 425 F 205 - 218 C	30 - 40
2 Crust Pies with Uncooked Filling	400 - 425 F	45 - 55

	205 - 218 C	

Self-Check – 8	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I. Short answer question

1. Write the baking temperature of different types of cake? (3 pts)

Note: Satisfactory rating – 3 points Unsatisfactory - below 3 points

You can ask you teacher for the copy of the correct answers.

Score = _____

Rating: _____

Information Sheet 9- Ensuring the desired characteristics of cake

9.1 Desired characteristics of cake

Cakes are indeed a bundle of joy that not only flatters your mouth but also adds taste to every function. Everybody loves them for their flavours, taste, and beauty. You get them in every shape, and every flavour and something more appealing is the characteristics of cakes. What make a cake good are the baking method involved and all the ingredients used in the process. Here are some of the most important features that make cake loved by all.

Appearance- The first and foremost thing that attracts anybody is the appearance of the cake. A cake should be beautiful and attractive to catch the very first glimpse of every individual present on the floor. Everything that we talk about the cake comes after the appearance. So, appearance is one of the most important features of a cake.

Taste- You know everyone loves cakes, obviously because of the taste. One of the very basic yet important features of any cake is its taste. How the cake tastes and what you feel after having a single bite defines the whole existence of the cake. A cake should be enriched in taste and should satisfy you completely.

Frosting- Another thing that should be added to the feature list is the frosting of the cakes. A cake should be frosted nicely, neither more nor less. Cakes without frosting look boring and tasteless.

Baking- A good cake is the one that's baked with proper steps. The cake should rise completely and should not look like a batter. It should be fluffy, spongy, and moist. Having fewer ingredients and proper baking methods make the cake more appealing. Using quality ingredients are always add-ons.

Flavours- The most necessary feature of any cake is its flavour. People are choosy, and cakes are made for everybody. Chocolate, vanilla, butterscotch, strawberry, and many more flavours are added to serve every taste and flavours are the centers of attraction of any cake.

There are many more features that make the cakes loved by every other person, whether they like any flavour. There are cakes available in the market for all your preferences. Also, there are homemade cakes that can easily be baked at home using a few ingredients like egg, flour, baking soda, sugar, and others that are easily available at home. You need to focus on the taste, quality, and texture of the cake.

Table3. Typical cake and desired characteristics

Cake	Picture	Flavor	Unique feature
German Chocolate Cake		• Rich chocolate. • Caramel/pecan/coconut frosting.	• Layered chocolate cake. • Topped and filled with a caramel topping mixed with pecans. • Cake sides may be iced.
Black Forest Cake		• Rich chocolate. • Sweet whipped icing. • Cherries.	• Layered chocolate cake with whipped cream and cherries. • Traditionally, kirschwasser cherry brandy is added.
Carrot Cake		• Rich, sweet, carrot-flavored. • May have nuts, raisins, coconut, and pineapple flavors. • Cream cheese icing adds tangy, nutty flavor.	• Dense cake with shredded carrots. • May include nuts, raisins, coconut, and pineapple. • Usually topped with cream cheese icing.
Crème cakes		• Many versatile flavors like lemon poppy seed, chocolate, or cinnamon.	• Many varieties. • Very moist crumb. • Baked in a bundt pan or tube pan.

Flourless Chocolate Cake		• Rich. • Intense chocolate flavor.	• Very decadent, dense cake. • Can be a good gluten-free option because no flour is used.
Angel Food Cake		• Sweet vanilla cake. • Toppings can add to the flavor.	• Very light textured white cake made with egg whites and sugar. • Baked in a tube pan. • Served plain it is fat free. • Can be served with fresh fruit, ice cream, or hot fudge.
Pound Cake		• Rich. • Versatile flavors depending on ingredients and toppings.	• Usually a loaf-shaped yellow cake made from one pound each of eggs, flour, sugar, and butter. • Can be yellow, chocolate or marbled cake.
Boston Creme Pie		• Rich. • Vanilla flavored cake. • Sweet custard. • Chocolate flavored icing.	• Not a pie, but a cake. • Cake layers sandwich a layer of custard. • Cake frosted with a poured ganache or chocolate glaze.

Table 4. Cake decoration type and characteristics

Icing	Common Ingredients	Flavor	Uses	Unique Features
Whipped (non-dairy)	• Vegetable oil. • Sugar. • Water. • Flavoring.	• Sweet, buttery. • But not as sweet as buttercream. • Many flavors — vanilla, chocolate, strawberry, etc.	• Icing, filling, borders, figures, writing, and piping.	• 100% non-dairy. • Made by infusing sugar and water into vegetable oil. • Icing is light and fluffy. • More shelf stable than dairy-based icing.
Cream Cheese	• Cream cheese. • Powdered sugar. • Vanilla. • Milk.	• Rich. • Nutty. • Tangy. • Slightly sweet.	• Carrot cake. • Red velvet cake. • Filling.	• Creamy icing with a thick or thin consistency, depending on amount of milk used.
Ganache	• Chocolate (dark or white). • Cream. • Maybe a liqueur or flavoring.	• Dark ganache has chocolate flavor. • White ganache tastes more like buttercream. • May be flavored with liqueurs or brandies, fruit purees, or extracts.	• Cake icing or filling.	• A pourable chocolate icing that dries to a firm, dense icing. • White chocolate ganache can be whipped to use as a fluffy icing.
Royal Icing	• Egg whites or meringue powder. • Sugar.	• Very sweet.	• Usually used for ornamental decoration, like piped figures or flowers on cakes, or decorated cookies, and for display cakes.	• Dries into very hard and durable icing. • Can be colored. • Color may fade with exposure to bright light.

Self-Check – 9	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Give short answer (2pts each)

4. Write down the desire characteristics of cake?
5. List some types of cake and flavour profiles?

Test II: Write true if the statement is correct and false if the statement is incorrect (2pts each)

2. The first and foremost thing of cake that attracts anybody is the appearance.
3. Cakes without frosting look boring and tasteless.

Note: Satisfactory rating -10 points Unsatisfactory -10 below points

You can ask you teacher for the copy of the correct answers.

Score = _____

Rating: _____

Operation Sheet 1– Techniques of variety cake and cookies preparation

Personal protective equipment's (PPE)

- Glove
- Eye google
- Safety shoe
- Guan
- Hair net

Purpose: Preparing good quality bakery products with the use of basic ingredients of bakeries and additional optional formulas. The baked product usually made with meeting desired characteristics of customer in a variety of shapes, sizes, textures and flavours. They are produce, usually golden brown and with a different texture with standardized baked products such as cake sponges, pastry, and cookies.

Tools and equipments

- Cake tin
- Cooling rack
- Mixing bowl
- Flour sifter
- Grater
- Measuring spoon
- Electric mixer
- Measuring cups
- Weighing scale
- Wire whisk
- Wooden spoon
- Beater
- Manual loader
- Tube center pan
- Muffin pan
- Cake pans
- Jelly roll/pan
- Bundt /pan
- Baking oven

$$Baker's\ \% = \frac{Total\ weight\ of\ ingredient\ Y}{Total\ weight\ of\ flour} \times 100$$

NB. Guides to calculate ingredient ratio

Ingredient ratio of sponge cake in bakery percent (%)

- Cake flour (short patent cake flour) 100
- Granulated sugar 80
- Whole eggs + egg yolks 50
- Salt 2.0–3.0
- Milk solids (optional) 6

- Baking powder (optional) 6
- Melted butter / shortening 10
- Corn syrup 20

1.1 Procedures of sponge cake baking

Step 1. Ingredients scaling.

Step 2. Mixing (hot / cold process).

Step 3. Depositing.

Step 4. Baking. Bake at 360–425°F (182–218°C) to an internal temperature of 204°F (95°C). Hot processed batter should have a shorter baking time. Cold processed batter should be baked longer.

Step 5. Deppaning, Depan from oven onto dusted paper pan liners while the cakes are still warm.

Step 6. Cooling. Cool product to loaf internal temperature of 95–105°F (35–40°C) before slicing and packaging

Step 7. Slicing.

Step 8. Packaging or serving.

Guidelines sponge cake preparation

- The weight of sugar should equal or exceed that of eggs
- The total weight of liquids, including eggs, should be greater than the weight of sugar
- The weight of flour should be less than that of the sugar or the eggs
- The total weight of the eggs and the flour should exceed the total weight of the sugar and liquids

Ingredient ratio of pound cake

- 2 cups flour
- 2 cups sugar
- 2 sticks butter, softened
- 1 tsp. vanilla
- 1 tsp. almond
- 1 tsp. lemon flavoring
- 5 eggs

1.2 Procedures of pound cake baking

Step 1. Mix all ingredient and spoon into greased and floured loaf pan.

Step 2. Bake at 350°F for about 1 hour.

Step 3. It is done baking when you stick a skewer into the center and it comes out clean.

Step 4. Cool on a baking rack.

Step 5. Sieve icing sugar over it before serving.

Ingredient ratio of Butter cake in bakery percent (%)

- Chlorinated soft wheat flour (air classified, short patent) 100.0
- Table sugar (refined, granulated sucrose) 85.0–90.0
- Butter 80.0–85.0
- Liquid milk 100.0–110.0
- Whole eggs (liquid) 50.0–60.
- Salt 0.5–1.5
- Baking powder 3.5–4.0
- Vanilla extract 0.5–1.5

1.3 Procedures of butter cake baking

Step 1. Ingredient scaling/metering.

Step 2. Mixing (target specific gravity is a function of volume and finished product texture)

Step 3. Depositing or panning

Step 4. Splitting or docking with a layer of oil on top of loaf

Step 5. Baking

Step 6. Cooling

Step 7. Finishing (decoration can be optional)

Step 8. Packaging

Important guidelines during Butter cakes baking

- Care should be taken to ensure consistency of the product if a combination of fast and slow acting leavening agents is used.
- The use of chemical leavening requires proper batter temperatures during the mixing process to activate them at the correct times. Batter temperature has a direct effect on the viscosity of the aerated oil-in-water emulsion and rate of chemical leavening reactions.
- Specific gravity measurement helps to ensure consistent product quality. This information can help in making adjustments to the mixing process.
- Chemical leavening impacts the pH of batter and cake. Incorporating high levels of baking powders should be avoided to avoid the development of undesirable taste and color in the baked cake.
- Cake flour imparts tenderness to baked cakes, a result of the flour's low protein content, thereby shorter mix times. Using chlorinated cake flour provides increased batter stability and improved processing tolerance.
- The use of emulsifiers or emulsified shortenings in addition to butter allows for incorporation of higher amounts of sugar, eggs and liquids, with formulations leaning towards high-ratio cakes with increased tenderness and longer shelf-life.

Ingredient ratio of Chiffon cake in bakery percent (%)

1st stage dry ingredients

- Cake flour (short patent flour from soft wheat) 100.0
- Granulated sugar 60.0–80.0
- Baking powder 4.0–5.0
- Salt 2.0–2.5

2nd stage liquid ingredients

- Vegetable oil 50.0–60.0
- Egg yolks 50.0–60.0
- Water 55.0–65.0
- Vanilla extract2.0–5.0

3rd stage foaming

- Egg whites 100.0–115.0
- Cream of tartar 0.3–0.6
- Granulated sugar 60.0–80.

1.4 Procedures of Chiffon cake baking

Step 1. Ingredients scaling

Step 2. Mixing**:** The mixing procedure and order of ingredient addition is extremely important in the production of chiffon cakes. Two separate mixing bowls or mixers must be used, one for mixing the solids and liquids (first and second stages), and the other for whipping the egg whites (3rd or foaming stage).

- Into a mixer bowl, sift dry ingredients including 100% of flour, baking powder, salt, more than 50% of the sugar, and, if any, powdered flavoring.
- Combine the liquids, and incorporate into dry ingredients. Mix until batter is smooth with no lumps.
- Degrease equipment when working with only one mixing bowl. Whip egg whites, cream of tartar, and remaining sugar until the formation of a stiff yet not dry peak, firmer than that for angel food. Target specific gravity is 0.175–0.250.
- Add batter mixture in a steady stream to the beaten egg whites as fast as the whites can accept it. Mix only enough to thoroughly blend the two together.
- Reversing this sequence (if folding the beaten egg whites into the batter) requires excessive mixing and could result in less volume. Final specific gravity is 0.30–0.50.

Step 3. Depositing

Step 4. Baking**:** Baking times and temperatures vary with the scaling/deposited weight and size of the pan. Baking temperatures are typically 177–204°C (350–400°F), with a bake time of 45–55 minutes for large tube pan and 20–30 minutes for small tube pans. The cake is done when the surface springs back from a light finger impression.

Step 5. Cooling**:** Invert immediately when removed from the oven and let stand inverted until cool.

Step 6. Depanning**:** Remove from the pan when the cake is at room temperature.

Step 7. Slicing

Step 8. Packaging or serving

Ingredient ratio of yellow cake

- Flour 500g
- Sugar 600g
- NFDM (Non Fat Dry Milk) 30g
- Salt 10g
- Baking Soda 12g
- SALP 10g
- Vanilla 5g
- Dry Eggs (45g Yolk/ 30g White) 75g
- Cake Shortening, emulsion 250g

1.5 Procedures of yellow cake baking

Step 1. 1st: 1 minute, Scrape down

Step 2. 1st: 4 minute, Scrape, remove paddle

Step 3. Switch to wire whip

Step 4. Add Water (distilled) 125 Bakers %, 625g

Step 5. Add 1/3 water, 2nd: 30 second, Scrape

Step 6. Add 1/3 water, 2nd: 30 second, Scrape

Step 7. Add remaining water, 1st: 15 second

Step 8. 2nd: 15 second, Scrape

Step 9. 3rd: 1 minute to break up/ aerate

Step 10. 2nd: 4 minute to aerate

Step 11. Scale: 400g batter per 8” pan

Step 12. Bake: 350°F = 30 minutes with half pressure steam.

Step 13. Layer is ‘done’ when it springs back after being gently prodded with finger.

Step 14. Shock Layers (drop 3” using peel) as exit oven.

Step 15. Cool: 7 minutes

Step 16. Invert onto hand, then re-invert onto papered pan.

Step 17. Place on racks to cool.

Ingredient ratio of white layer cake

- 244 grams cake flour
- 350 grams sugar
- 4 tsp. baking powder
- 1 tsp. salt
- 170 grams butter (at room temperature)
- 1 cup milk
- 3/4 cups egg whites
- 1/2 tsp. almond emulsion
- 1 tsp. vanilla extract

1.6 Procedures of white layer cake baking

Step 1. Combine the first five ingredients and mix until crumbly.

Step 2. Combine liquids in a separate bowl and blend with a fork

Step 3. Mix all but 1/2 cup of the liquids with the dry ingredients in the mixer and beat at medium speed for 1 $^{1}/_{2}$ minutes.

Step 4. Add the remaining 1/2 cup of liquid and mix another 30 seconds. Then scrape the bowl and mix on high for 20 seconds.

Step 5. Bake at 175^{o}F for 20 to 24 minutes

Ingredient ratio of cookies in (bakery percent)

- Granulated sugar: 40%
- Brown sugar: 40%
- Corn syrup: 10%
- Shortening: 65%
- Salt: 1.5%
- Dry eggs: 5%
- Baking powder: 1%
- Water: 15%
- Vanilla: 2%
- Pastry flour: 100%
- Chocolate chips: 65%

1.7 Procedures of cookies baking

Step 1. Cream the sugars, corn syrup, shortening, salt, dry eggs, and baking powder at 1st speed. Scrape, and then increase to 2nd speed for 3 minutes.

Step 2. Mix the water and vanilla, and slowly add it in at 1st speed. Scrape, and then mix at 2nd speed for 2 minutes.

Step 3. Mix the pastry flour and chocolate chips in a separate container and add it into the mixer. Mix at 1st speed for 15 seconds; scrape down and mix at 2nd speed for 15 seconds. Do not over-mix at this stage, or you will develop the gluten network and produce a tougher cookie.

Step 4. Transfer cookie dough into depositor. Deposit cookies onto sheet pans with liners.

Step 5. Bake in the oven at 350^{o}F for 13-15 min, or until cookies are golden brown on the bottom.

Step 6. Remove the cookies from the oven and transfer onto a cooling shelf immediately; otherwise you will overbake the cookies, as they continue cooking on the pan.

Step 7. Cool for 1 hr. before packaging.

Step 8. Cookies can be stored frozen for extended shelf life.

Step 9. Frozen cookies can be thawed and served without reheating.

LAP TEST	Performance Test

Name…… ID…… Date……

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within **10** hour. The project is expected from each student to do it.

Task 1: Perform sponge cake baking operation

Task 2: Perform pound cake baking operation

Task 3: Perform butter cake baking operation

Task 4: Perform chiffon cake baking operation

Task 5: Perform yellow cake baking operation

Task 6: Perform white layer cake baking operation

Task 7: Perform cookies baking operation

LG #24 LO #4- Bake products

Instruction sheet

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- Operating ovens
- Baking product with food safety and quality requirements
- Identifying, rectifying and/or reporting unacceptable baked product.
- Maintaining work area with housekeeping standards.
- Conducting work with workplace environmental guidelines

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Operate ovens
- Bake product with food safety and quality requirements
- Identify, rectify and/or report unacceptable baked product.
- Maintain work area with housekeeping standards.
- Conduct work with workplace environmental guidelines

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below.
3. Read the information written in the information Sheets
4. Accomplish the Self-checks
5. Perform Operation Sheets
6. Do the “LAP test”

Information Sheet 1- Operating ovens

1.1 Introduction

An oven is an enclosed cavity or tunnel where dough or batter is surrounded by a hot environment and becomes baked and transformed into bread, cookies, or other products. In order to bake the products, ovens use energy generation sources, e.g., combustion of fuels such as gas or oil, or electricity. The released available energy from these sources is transferred to the products by means of radiation, conduction, and/or convection. The oven sets and maintains the proper conditions of heat flux, humidity, and temperature to carry out the baking process and the removal of moisture from the products.

An oven is the most important processing step in the baking industry for several reasons:

- It is the workhorse of the bakery. The production output of a bakery is usually controlled by the capacity of the oven.
- Heat and mass transfer phenomena both take place simultaneously inside this piece of equipment, triggering physicochemical and biochemical changes in the product.
- Baking in the oven is the step that imparts the final characteristics to the products (e.g., shelf life, flavor, texture, color, and aroma).
- It provides a crucial kill step that prevents pathogens from thriving within the product.

1.2 Types of ovens

Depending on their mode of operation and heat transfer mechanism, ovens can be classified as either batch or continuous equipment and as using either direct or indirect heat exchange. The type of oven that suits a bakery's operation may be a function of production capacity, product specifications, floor space, available energy sources, operation efficiencies, construction materials, and maintenance needs.

1.2.1 Direct-fired oven (DFO)

Direct-fired oven place combusting gas (energy source) inside the baking chamber to heat the air and the products. The heat transfer in a direct gas-fired oven is primarily carried out by radiation from the flames (ribbon burners placed above and below the oven band), top, base and walls of the baking chamber. Direct-fired ovens are very efficient because they convert most of the fuel to heat and process the products, and this lowers fuel consumption and operating costs.

1.2.2 Indirect-fired oven (IFO)

IFOs indirectly heat the baking chamber by using exchangers. This oven is suitable for sensitive bakery products (e.g., cakes, pastries) since the byproducts of combustion remain inside the heat exchanger structure and do not come into direct contact with the dough pieces. This eliminates the risk of contamination and of impregnation of off-odors in the products. This type of oven is less often used nowadays because of its limited power for heat transfer and energy efficiency (amount of fuel burned in a given time versus water loss (evaporated moisture) of the products during baking).

1.2.3 Electric oven

Electric ovens have construction features similar to those of DFOs, and operate similarly in terms of heat transfer mechanism to bake the products. This type of oven uses electrical resistances in place of the traditional gas burners of DFOs. Electric-fired ovens have limited use in the baking industry due to their power consumption and costs per kWh. They also face scale-up challenges that require further research and industry application.

1.2.4 Peel brick oven

The peel brick oven was one of the first constructed baking units in human history. It consists of a massive brick material chamber. The chamber is connected to a refractory tile floor that holds the dough pieces. Coal and wood are used as fuel (combustion source). Because of their construction features (insulation capacity of materials and thickness of the walls), these ovens are able to steadily transfer radiant heat to the products, and also maintain high temperatures inside the baking chamber for prolonged

periods of time. The ovens are operated manually and require special skills from the baker.

1.2.5 Rack oven

A rack oven is a batch vertical oven into which racks full of sheet pans can be wheeled for baking. This unit can hold 8 to 20 sheet pans per baking cycle. Some units make use of electric or fuel sources, and place fans inside the baking chamber (generation of convection drying) to speed up baking times and to develop special features in the products. This oven is suitable for retail operations due to its floor space economy, and medium to long baking cycle times. The products are baked upon customer order, and are often offered directly (unpackaged) for immediate consumption. These ovens usually have programmable (saved) recipes so that the operator can change baking time and temperature, intensity of air ventilation, and steam impingement frequency.

1.2.6 Reel oven (also known as revolving tray oven)

A reel oven is an oven in which trays or shelves are placed on platforms rotating on a central horizontal axis. A high baking chamber is required to accommodate the reel structure, thereby saving floor space. Reel ovens are normally directly fired with gas or electricity, with the heating source located centrally across the floor of the chamber. This type of oven is mostly designed for retail bakeries or baking plants with small-scale production. Reel ovens often do not generate uniform distribution of heat transfer due to their revolving nature and interfering structure for radiant heat transfer. Products placed on sheet pans or trays continuously rotating may present uneven coloring or poor final moisture distribution.

1.2.7 Conveyorized oven (also known as traveling tray oven)

Conveyorized ovens replace the reel ovens concept with two parallel endless conveying chains that carry trays of products through the length of the baking chamber, so the dough pieces continually enter and leave the oven. Their main advantages are simplicity of design, and uniformity of baking as the products travel the same path through the baking chamber. A motor drive directly controls band speed, thereby determining baking cycle time. Conveyorized ovens may be single-lap or double-lap. In single-lap ovens, the trays containing the products travel a single pass (back and forth).

The trays in a double-lap oven travel through four heat zones instead of the two zones of the single-lap oven.

1.2.8 Tunnel oven

Tunnel ovens are continuous mode operation baking units, and are commonly used in large-scale bakeries. This unit typically has a long baking chamber (usually more than 80 meters in length), which goes from one side (loading point) to another (unloading point) in a straight conveying band. The conveyor band material may be built of wire mesh or carbon steel sheets. Tunnel ovens are commonly powered by fuels such as natural gas (used for baking), and electricity (for powering air circulation and conveying system). The baking chamber may be divided into several baking zones. This makes the application of a temperature sequence possible, which provides the baker more flexibility in baking conditions and more complexity for controlling baking parameters.

1.2.9 Hybrid oven

Hybrid ovens combine the three modes of heat transfer and take advantage of their synergistic effect on products. This type of oven usually requires a high degree of automation since its construction, control systems, and energy sources are too complex to be manipulated manually.

1.3 Operating modes of oven

i. Combi mode

Use to roast and braise meats, bake poultry and fish and reheat prepared foods. The combination of steam and hot air will improve yield and reduce overall cooking times.

ii. Hot air mode

Use to bake cakes, cookies and breads and to roast and bake meats and poultry. The hot air mode circulates air in the same manner as a convection oven.)

iii. Steaming mode

Use to steam fresh, frozen or canned vegetables and shellfish. Use of the Combi-oven to steam foods can save time, labor, and help maintain appearance, and preserve

nutrients normally lost by other cooking methods. The oven is ideal for steaming more than one type of vegetable at the same time without flavor transfer.

Heat in transferred from the oven to the baked good by the following mechanisms, depending on the type of oven

- **Conduction heat**

Conduction transfers heat from the area of higher temperature to the area of lower temperature. Conduction is particularly important when baking with preheated heavy mesh bands and steel bands

- **Convection heat**

In convection ovens jets of hot air are blown onto the surface of the products. The impingement of hot air is particularly effective in drying the dough pieces

- **Radiation heat**

Infra-red radiation is the most important heat transfer method for biscuit baking. Radiation is stable, penetrative and flexible and is essential in creating good structure and texture of the biscuits

1.4 Operating parameters of ovens

The operating and setting parameters that manipulate during baking process includes as follow

1.4.1 Temperature

Oven temperature is one of the key baking parameters. It can be measured, modified, and controlled in order to influence process conditions directly, thereby affecting a product's final characteristics. Oven temperature causes physical transitions and chemical reactions to take place in the dough/batter. The following stages are temperature-dependent, and participate in the sequential transformation of bread dough.

- **Oven temperature controlling mechanisms**

Specific temperatures are set inside the baking chamber to achieve the required baking profile of a given product. Controlling the heat input from the energy sources (e.g., burners, electric resistances) is then vital for maintaining the set baking temperatures. Control of oven temperature can be achieved automatically by :

- ✓ A temperature sensor (thermocouple probe) senses, measures, and transmits the temperature (controlled variable) of the air inside the baking chamber.
- ✓ As the demand for hot air increases or decreases (e.g., in moments when the load of the oven increases, oven temperature goes down; fuel combustion must then increase to return oven temperature to its set point).
- ✓ A change in oven temperature is sensed and converted to an electrical signal, amplified, and sent to a controller that evaluates the signal and sends a correction signal to an actuator.
- ✓ The actuator (gas valve) opens or closes to adjust the flow rate of the air and fuel (carbureted mixture) in the burner (manipulated variables) to keep flame intensity such that it can consistently deliver the power required. In this way, the temperature of the baking chamber is returned to its predetermined value.

1.4.2 Humidity

Oven humidity is an important variable in baking operations. Along with time, temperature and air flow (in convection ovens), it is used to better control the baking step.

- The temperature in an oven is higher than the boiling point of water (212°F or 100°C at sea level) and far beyond the temperature range where moist air can be modeled as a perfect gas. So, humidity inside the baking chamber cannot be measured as relative humidity.
- Instead, the absolute humidity concept or humidity mass ratio is used

- **Baking parameters influenced by oven humidity**

Crust color: High humidity lightens the crust color of baked goods. This is because excess humidity blocks direct transfer of heat to the product. In addition, the condensates formed on the dough surface act as a natural insulation to heat transfer. Under this scenario, crust temperature during baking is lower than the target resulting in light-colored finished product.

Dough expansion and product volume: High humidity increases the volume of baked products. A baking chamber rich in moisture decreases the driving force for water migration. So, less water is lost from the product to hot air, causing dough/batter to remain moist to expand/stretch further before the crust sets.

Moisture content: High humidity raises the final moisture content of the baked product which influences product shelf-life and slice ability.

Crust character: Some artisan and hearth breads require steaming to generate surface condensation and produce a glossy and shiny crust. Higher humidity will result in a glossier and thicker product crust.

- **Factors that influence oven humidity**

Oven load: Humidity inside the oven increases as more products enter the baking chamber. At the same time, heavier loads require more heat to evaporate the water. This results in a slight temperature drop in concert with the humidity increase.

Temperature: Absolute humidity is lower at low oven temperatures because water evaporates more rapidly at higher temperatures.

Oven steaming: During the first few minutes of baking, large amounts of low-pressure steam are injected into the baking chamber. Saturation level of steam and the amount of steam used in the oven both affect on the humidity levels.

- **Control mechanism of oven humidity**

Purge systems: Oven humidity and distribution of heat are usually controlled by fixed-speed extraction fans and/or dampers. They can be adjusted manually or via motorized

valve controlled by PLC. In modern ovens, it is usually controlled by variable-speed extraction fans.

Air refreshments: In some applications and for safety reasons moist hot air can be replaced by fresh air during the baking cycle leading to improvements in product characteristics.

Steam injection: Monitor and adjust the saturation level, pressure and amount of steam being injected into ovens that bake hearth and artisan breads.

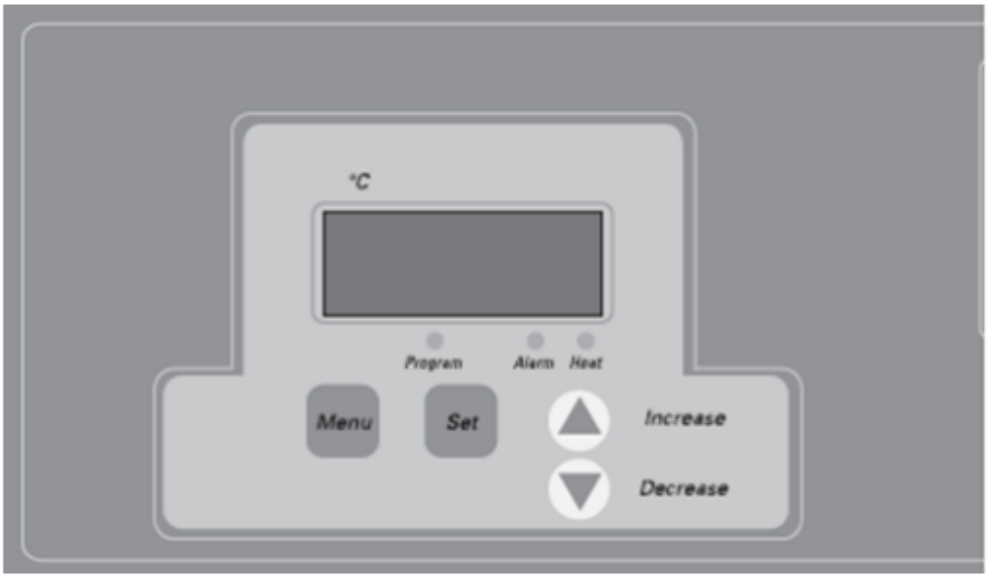


Figure11. Control panel of oven

Temperature display: In the normal operating mode, shows the current oven temperature. During programming, indicates the oven set temperature target.

Heat indicator: Lights up when power is being supplied to the oven heater.

Alarm indicator: Lights up if the actual oven temperature exceeds the alarm temperature. The alarm temperature is factory-adjusted to be 5°C above the set temperature.

Program indicator: Lights when the control temperature is being set

1.5 Maintenance of ovens

Oven maintenance focuses on two major goals:

- Prevent food safety hazards (physical, biological, and chemical) from occurring by reducing the likelihood of foreign material contamination, under-processing, and contamination with lubricants. These hazards may pose a food safety risk to customers, not to mention the loss of a good reputation and money.
- Prevent mechanical, electrical, and thermal equipment failures that could negatively impact normal oven operation; and increase downtime, which could trigger significant economic losses.

Inspection and maintenance of equipment and calibration of measuring and instrumentation devices are vital for smooth oven operation. Special attention must be paid to: welded components, drive chains and belts, motors and drives, steam lines and fittings, air lines and fittings, seals and gaskets in piping, bearings, conveyor belts, bands, temperature indicators and controllers, in-line humidity meters and humidity exhaust systems, electrical control systems, and fans (axial or centrifugal

Self-Check – 1	Written test

Name…… ID……. Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Chose the best answer (2pts)

1. Depending on their mode of operation and heat transfer mechanism, ovens can be classified as,

a. Indirect-fired oven
b. Direct-fired oven
c. Electric oven
d. Rack oven
e. All

Test II: Give short answer (2pts each)

1. Describe some of the operating mode of oven?
2. Write the operating parameters of oven?

Test III: Write true if the statement is correct and false if the statement is incorrect (2pts each)

1. Oven temperature causes physical transitions and chemical reactions to take place in the dough/batter.
2. High humidity raises the final moisture content of the baked product which influences product shelf-life and slice ability.

Note: Satisfactory rating – 10 points **Unsatisfactory - below 10 points**

You can ask you teacher for the copy of the correct answers.

Score = _____

Rating: _____

Information Sheet 2- Baking product with food safety and quality requirements

2.1 Introduction

Food is basic for life. Quality or excellence in our food supply should be an important concern to all food processors. Safety and wholesomeness are the most important attributes of food quality. The lack of quality as it relates to safety and wholesomeness can result in personal injury, sick-ness or death. Foodborne illness is an example of sickness or even death when unsafe foods are produced and eaten.

All over the world people are seriously affected every day by diseases that are caused by consuming unhygienic and unsafe food. We have to give due emphasis to good hygienic practices to prevent and control foodborne diseases. Foodborne diseases result from eating foods that contain infectious or toxic substances. The food we eat should be free from contaminants such as microorganisms and chemicals. This session will introduce the principles of food hygiene and safety. You will also learn about food control, food inspection and supportive enforcement measures that can contribute to food hygiene and safety

2.2 Food safety and quality requirements baked product

- **Quality requirements**

Quality is the quality of a product may be defined as the sum of a number of related characteristics such as shape, dimension, composition, strength, workmanship, adjustment, finish and colour". Control refers to the use of all the ways and means whereby quality standards could be maintained. Control precisely aims at bringing the product up to pre-determined standards by minimizing deviations from established and present standards.

Quality control concerns with verifying whether everything occurs in conformity with the plan adopted, the instructions issued and principles established. It is objected to point out weaknesses and errors in order to rectify them and prevent recurrence. Quality control is also concerned with the control of quality of the product during the process of production. It aims at achieving the predetermined level of quality in a product. It is

concerned with controlling those negative variances which ultimately affect the excellence of a manufacturer in producing the products.

Quality control is essential to building a successful business that delivers products that meet or exceed customers' expectations. It also forms the basis of an efficient business that minimizes waste and operates at high levels of productivity.

Customer Loyalty: Providing the market with quality products helps to increase customer satisfaction and loyalty. Satisfied customers may also recommend your products to

Competitiveness: The ability to offer customers quality products provides a strong competitive advantage. Quality can also open new business opportunities in market sectors where quality is critical.

- **Food Safety requirements**

Quality control of ingredients is the first line of defense against inherent process and ingredient variability. Generally speaking, customer complaints normally can be classified into the following categories:

- Foreign material in the finished product. This could be anything from dirt, whole wheat dough in white pan bread, sesame seeds in a product that should not contain them, pieces of cloth, brittle plastic, glass, metal, etc. In summary, the product contains something that does not belong there.
- Violation of label declarations. This happens if a product is underweight, contains an undeclared allergen, or does not comply with labeled amounts of sodium, fat, or trans-fat.
- Shelf life issues. This could be due to the presence of mold or undesirable change in texture as in the case of stale bread.
- Off-flavors or off-aromas. This could be due to undesirable enzymatic activity or microorganisms.
- Poor product quality. This could involve breakdown of icings, melting of chocolate enrobing, bread with low volume, cakes with too open grain and tunneling, texture problems, color problems, symmetry problems.

- Physically damaged product. Smashed, leaking, change of appearance.

How often a given ingredient is tested or analyzed should be based on how critical the raw material is or how important it is for keeping product quality. For example, wheat flour and yeast should have specific quality control schedules and procedures to always have the best materials for bread and cakes production

Self-Check – 2	Written test

Name…… ID……. Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Give short answer (2pts each)

1. Describe the food safety requirements?
2. Write the quality requirements of baking product?

Note: Satisfactory rating - 4 points **Unsatisfactory - below 4 points**

You can ask you teacher for the copy of the correct answers.

Score = _____

Rating: _____

Information Sheet 3 - Identifying, rectifying and/or reporting unacceptable baked product

3.1 Introduction

It is important to be methodical when trying to determine the cause of a fault. Sometimes there may be more than one cause and these may interact with each other. It is best to try to solve the fault by one change at a time rather than making changes to ingredients, processing and handling all at once. Possible causes of faults in bread can be grouped into five main categories:

- Defective or inappropriate ingredients
- Unbalanced formulation
- Poor dough development and maturity
- Incorrectly adjusted or poorly maintained equipment
- Poor handling after baking.

3.2 Unacceptable cake and cookies product

- **Too Dense**

A cake that comes out of the oven very dense simply did not get enough air in the batter. This could have happened in a number of ways so you may need to troubleshoot your batter to find out how to add the air back to your cake.

- **Dry**

This could be due to the ingredients or the oven. Check you put the right amount of wet ingredients in, e.g. using large eggs (if asked for) rather than small and measuring liquids out properly. Similarly, you don't want to put too much of any dry ingredients in, as these absorb moisture. Use an oven thermometer to check your oven isn't too hot, which could dry the sponge out. Also, use a kitchen timer to check you aren't leaving your cake in the oven too long.

Fig 12. Dry cake

- **Undercooked**

If your cake came out raw in the middle and you let it bake for the time suggested in the recipe, it could be that your oven is too cool. Use an oven thermometer to calibrate your oven correctly. Let an undercooked cake bake until a metal skewer can be removed from the center cleanly.

- **Split mixture**

When your butter and sugar has been creamed for too long and looks like it is about to split (it will look curdled), it's time to stop mixing and throw in the dry ingredients.

Fig 13. Split mixture

- **Sunken**

If it is still raw in the center, cook for a few more minutes until a metal skewer comes out cleanly. An oven thermometer will help you check that the oven isn't too cool. If the cake is cooked but sunken, it's just one of those things, it could be an issue with raising agents. But don't panic, frosting will cover a world of sponge sins.

- **Stuck to the tin**

If your cake is stuck, let it cool for half an hour or so. This will stop it from crumbling to pieces. Run a knife around the edge of the tin to loosen it. Using a cooling rack or your hand to catch the sponge, flip the tin and hopefully the sponge should come free. We always use greaseproof paper cut to size to prevent sticking.

- **Cake mixture overflowing**

We recommend filling your tins no more than two-thirds full to leave rising room. If your tin is overflowing, there is too much mixture or the tin is too small for the recipe. If you're experimenting with different sized tins, a good rule of thumb is to only fill tins two-thirds full and to check with a metal skewer in the center to see if it is baked through.

Fig 14. Cake mixture overflowing

- **Too flat /didn’t rise**

If your cake failed to rise, check you put the raising agents in it. Also, check your raising agents are in date as out-of-date ones won’t have the same oomph. It could also be a symptom of it not being cooked enough, in which case, pop it back in the oven for a few more minutes. It could also be that the tin is too big so the sponge has spread too thinly.

- **Burnt**

If your cake is burnt beyond saving, then you won’t want to eat it as it will taste terrible. If you can salvage it, we recommend using a small serrated knife to cut away any burnt edges and tops. Smother on frosting to save the day.

- **Cracked top**

When your cake splits or cracks, this means it has risen too quickly. This could be that the oven temperature is too high, in which case, use an oven thermometer to check. It could also be that there is too much of a particular raising agent in there. Frosting will cover up any cracks.

Fig 15. Cracked top

- **Crunchy/greasy edges**

This usually happens when too much butter or fat has been smothered around the tin to stop the sponge from sticking before the mixture went in. This has the effect of frying the sponge when it melts to oil in the heat and can make cakes overly crispy or greasy at the edges. This won't make or break a cake, but go lightly next time you grease your tins.

- **Too heavy**

If your sponge has come out too heavy or dense but cooked through, this could be due to under-mixing. Mixing is an important step in incorporating lots of air so that the sponge becomes light and fluffy. It could also be due to the fact that there weren't enough raising agents used. Creaming the butter and sugar is an important stage in the sponge making process and should be done until it is light and fluffy, for at least 5 minutes.

- **Tastes bad**

A bitter taste could be due to too much raising agent in the mix. If your cake tastes too much of egg, we don't recommend reducing the amount of eggs next time. Some cakes, such as chiffon cakes, call for a lot of egg and this is just the recipe. It's better to try and mask an overly eggy cake with a dash of edible flavoring, such as good quality vanilla extract.

Fig 16. Tastes bad

- **Frosting cakes/cupcakes before they cool**

Figure 17. Frosting cakes/cupcakes before they cool

- **Opening the oven too often**

Opening the oven lets hot air flow out and decreases the temperature of the oven. It could even cause cakes to collapse a bit if you open the oven too often.

Figure 18. Opening the oven too often

- **Cookies are pale or brown too lightly (light centers with dark edges)**
  - ✓ Baking in pans with sides, such as a jelly roll pan, can cause insufficient browning. Cookie sheets without sides are recommended.

- ✓ Baking two cookie sheets at the same time can limit air circulation and inhibit good browning.

- **Food are not done when the estimated cooking time is finished**
  - ✓ The oven door was opened too frequently.
  - ✓ The oven was too crowded. There needs to be adequate air flow around the pans.
  - ✓ The oven temperature was too low.

- **Food is too brown on the bottom (i.e. cookies, biscuits)**
  - ✓ The baking utensils are too dark (non-stick finish or darkened by age) or glass. Dark pans absorb more heat and can cause over browning. Try lowering the oven temperature 25 degrees for these types of utensils or use a pan with a shiny finish.
  - ✓ The baking utensil is too large for the recipe.
  - ✓ The oven was not preheated. We recommend preheating the oven until the preheat tone sounds or the preheat light goes out. If the oven does not have a tone or light, preheat for 10-15 minutes.
  - ✓ The pans are too close to each other or the oven walls. We recommend allowing 1-1 1/2 inches between pans and oven walls.
  - ✓ The cookie sheet may be too large for the oven and not allowing sufficient heat circulation. The heat is trapped under the pan and the cookies will burn on the bottom before the tops are brown. We recommend at least 1 to 1 1/2 inches around the cookie sheet.
  - ✓ The oven door may be opened too often. Opening the door frequently during baking causes the lower element to cycle on and provide too much intense heat.
  - ✓ The rack position used was too low. The use of the second or third rack position is recommended.

Self-Check – 3	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Give short answer (2pts each)

1. Describe unacceptable cake and cookies products?
2. Write the possible causes of faults?

Note: Satisfactory rating - 6 points Unsatisfactory - below 6 points

You can ask you teacher for the copy of the correct answers.

Score = _____

Rating: _____

Information Sheet 4- Maintaining work area with housekeeping standards

4.1 Introduction

Good housekeeping not only results in a cleaner workplace, but makes it safer as well. Good housekeeping reduces illnesses and injuries and promotes positive behaviors, habits, and attitudes. Employers are responsible for assessing each workplace before work begins to identify the potential hazards present, and determine ways to eliminate the hazards. An effective housekeeping program is an important element in workplace safety and health management systems. To avoid these hazards, a workplace must maintain order throughout a workday.

4.2 Maintaining work area with housekeeping standards

Good housekeeping practices in the laboratory have a number of benefits. For example, in terms of safety, it can reduce the number of chemical hazards (health, physical, reactive, etc.) in the laboratory and help control the risks from hazards that cannot be eliminated. Practices that encourage the appropriate labeling and storage of chemicals can reduce the risks of mixing of incompatible chemicals and assist with regulatory compliance. From a security standpoint, order in the laboratory makes it easier to identify items out of place or missing. And finally, good housekeeping can help reduce scientific error by, for example, reducing the chances of samples becoming confused or contaminated and keeping equipment clean and in good working order. Therefore good housekeeping practices are essential for all workplaces, example

- Spills on floors should be cleaned up immediately
- walkways should be kept clear of obstructions
- work materials should be neatly stored
- Any waste should be regularly removed
- Suitable containers for waste should be conveniently located and regularly emptied.

Poor housekeeping can be a cause of incidents, such as:

- Tripping over loose objects on floors, stairs and platforms
- Being hit by falling objects

- Slipping on greasy, wet or dirty surfaces
- Striking against projecting, poorly stacked items or misplaced material
- Cutting, puncturing, or tearing the skin of hands or other parts of the body on projecting nails, wire or steel strapping

4.3 Important of good housekeeping practices

Effective housekeeping can help control or eliminate workplace hazards. Poor housekeeping practices frequently contribute to incidents. Housekeeping is not just cleanliness. It includes keeping work areas neat and orderly, maintaining halls and floors free of slip and trip hazards, and removing of waste materials (e.g., paper, cardboard) and other fire hazards from work areas. It also requires paying attention to important details such as the layout of the whole workplace, aisle marking, the adequacy of storage facilities, and maintenance. Good housekeeping is also a basic part of incident and fire prevention. Effective housekeeping is an ongoing operation: it is not a one-time or hit-and-miss cleanup done occasionally. Periodic "panic" cleanups are costly and ineffective in reducing incidents. Effective housekeeping includes the following:

- Reduced handling to ease the flow of materials
- Fewer tripping and slipping incidents in clutter-free and spill-free work areas
- Decreased fire hazards
- Lower worker exposures to hazardous products (e.g. Dusts, vapours)
- Better control of tools and materials, including inventory and supplies
- More efficient equipment cleanup and maintenance
- Better hygienic conditions leading to improved health
- More effective use of space
- Reduced property damage by improving preventive maintenance
- Less janitorial work
- Improved morale
- Improved productivity (tools and materials will be easy to find

Poor housekeeping can be a cause of incidents, such as:

- Tripping over loose objects on floors, stairs and platforms

- Being hit by falling objects
- Slipping on greasy, wet or dirty surfaces
- Striking against projecting, poorly stacked items or misplaced material
- Cutting, puncturing, or tearing the skin of hands or other parts of the body on projecting nails, wire or steel strapping.

4.4 Apply food safety procedures to work practices

Cleaning and sanitizing program since cleaning and sanitizing may be the most important aspects of a sanitation program, sufficient time should be given to outline proper procedures and parameters. Detailed procedures must be developed for all food-product contact surfaces (equipment, utensils, etc.) as well as for non-product surfaces such as non-product portions of equipment, overhead structures, shields, walls, ceilings, lighting devices, refrigeration units and heating, ventilation and air conditioning (HVAC) systems, and anything else which could impact food safety.

Cleaning frequency must be clearly defined for each process line (i.e., daily, after production runs, or more often if necessary). The type of cleaning required must also be identified. The objective of cleaning and sanitizing food contact surfaces is to remove food (nutrients) that bacteria need to grow, and to kill those bacteria that are present. It is important that the clean, sanitized equipment and surfaces drain dry and are stored dry so as to prevent bacteria growth. Necessary equipment (brushes, etc.) must also be clean and stored in a clean, sanitary manner. Cleaning/sanitizing procedures must be evaluated for adequacy through evaluation and inspection procedures. Adherence to prescribed written procedures (inspection, swab testing, direct observation of personnel) should be continuously monitored, and records maintained to evaluate long-term compliance.

Self-Check – 4	Written test

Name…… ID……. Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Give short answer (2pts each)

1. Write the incident of poor housekeeping?
2. Describe the importance of good housekeeping practices?

Test II: Write true if the statement is correct and false if the statement is incorrect

1. Good housekeeping reduces illnesses and injuries and promotes positive behaviors, habits, and attitudes (2pts)

Note: Satisfactory rating - 6 points **Unsatisfactory - below 6 points**

You can ask you teacher for the copy of the correct answers.

Score = _____

Rating: _____

Information Sheet 5- Conducting work with workplace environmental guidelines

5.1 Work place environmental guidelines

Workplace hazards include things such as slippery floors, loose floor mats, and sharp knives, as well as hazardous materials. It is important for all employees to be aware of hazards, even if they seem obvious. Employers should provide information and training on any safe work procedures related to the job site. Safe work procedures are specific directions for doing a task or operating equipment that may pose a risk or hazard to the worker. Workers should always ask their supervisor if there are any safe work procedures they need to be aware of and/or any written instructions they should be following. one of the main hazards in any workplace are cleaning products, some of which are everyday products that a person may not regard as hazardous, such as sanitizers and household cleansers. Cleaning products and all other materials that are potentially hazardous are governed by the workplace hazardous materials information system.

5.2 Legislative requirements

Supplier labels when a supplier produces or imports a product for distribution and sale, that supplier must prepare a label that provides the following seven pieces of Information:

- ✓ Product identification
- ✓ Supplier identification
- ✓ Hazard symbols
- ✓ Risk phrases
- ✓ Precautionary statements
- ✓ First aid measures
- ✓ A statement advising that an MSDS is available

5.3 Work place requirements

• **Work layout**: The layout of the workplace is required to allow persons to enter and exit the workplace and move within safely, both under normal work conditions and in an emergency.

• **Entry and exit**: Entries and exits are required to be safe to allow impeded access and egress for all workers, students and visitors including those with special needs. In particular:

- ✓ Entries and exits should be slip resistant under wet and dry conditions
- ✓ Aisles and walkways need to be at least 600mm wide and kept free of furniture or other obstructions
- ✓ Any walkways, boundaries or pathways shall be marked with 50mm wide with a contrasting colour e.g. White or yellow
- ✓ Open sides of staircases should be guarded with an upper rail at 900mm or higher and a lower rail
- ✓ Handrail should be provided on or at least one side of every staircase
- ✓ Separate entry and exits for mobile equipment e.g. Forklifts or trucks, and pedestrians are to be provided
- ✓ Power operated doors and gates should have safety features to prevent

- **Work areas** The layout of the work area should be designed to provide sufficient clear space between furniture, fixtures and fittings so workers can move freely without strain or injury also evacuate quickly in case of an emergency. In determining how much space is required, the following should be considered:
  - ✓ The physical actions needed to perform the task
  - ✓ The need to move around while working
  - ✓ Whether the task is to be performed from a sitting or standing position access to workstations
  - ✓ The equipment to be handled and the personal protective equipment that may be worn.

- **Floors and other surfaces** Floor surfaces shall be suitable for the work area and be chosen based on the type of work being carried out at the workplace, as well as the materials used during the work process, the likelihood of spills and other contaminants, including dust and the need for cleaning. In general:
  - ✓ Floors shall be free from slip or trip hazards e.g. Cables, uneven edges, broken surfaces

- ✓ Floor surfaces shall have sufficient grip to prevent slipping, especially in areas that may become wet or contaminated
- ✓ Anti-fatigue matting, carpet, shock absorbent underlay, cushion backed vinyl shall be provided for workers where static standing occurs
- ✓ Carpet shall be properly laid without loose edges or ripples and should be well maintained
- ✓ Floors should be strong enough to support loads placed on them

- **Workstations** should be designed so workers are comfortable undertaking their task and allow for a combination of sit and standing tasks. For tasks undertaken in a seated position, workers should be provided with seating that:

  - ✓ Provides good body support, especially for the lower back
  - ✓ Provides foot support, preferable with both feet flat on the floor, otherwise footrest shall be provided
  - ✓ Allows adequate space for leg clearance and freedom of movement
  - ✓ Fully adjustable to accommodate different size workers (e.g. Seat height, back rest height and back rest tilt adjustments) and should not tip or slip utilizing a five-point-base
  - ✓ Chairs shall be fitted with castors for carpeted surfaces and glides or braked castors on hard surfaces

  • **Lighting** Sufficient lighting is required to allow safe movement around the workplace and to allow workers to perform their job without having to adopt awkward postures or strain their eyes to see. Emergency lighting is to be provided for the safe evacuation of people in the event of an emergency. The following factors are to be taken into account:

  - ✓ The nature of the work activity
  - ✓ The nature of hazards and risk in the workplace
  - ✓ The work environment
  - ✓ Illumination levels, including both natural and artificial light
  - ✓ The transition of natural light over the day
  - ✓ Glare

- **Air quality** Workplace are to be adequately ventilated which includes provision of fresh, clean air drawn from outside the workplace, uncontaminated from flues or other outlets and be circulated through the workplace. Workplace inside buildings may have natural ventilation, mechanical ventilation or air conditioning. An air-conditioning system should:

✓ Provide a comfortable environment in relation to air temperature, humidity and air movement

✓ Prevent the excessive accumulation of odors

Reduce the levels of respiratory by-products, especially carbon dioxide, and other indoor contaminants that may arise from work activities.

Self-Check – 5	Written test

Name…… ID……. Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: choose the best answer

1. Which one of the following factors is to be taken into account in workplace environment?(2pts)

a. The nature of the work activity
b. The nature of hazards and risk in the workplace
c. The work environment
d. Illumination levels, including both natural and artificial light
e. All of the above

Test II: Give short answer (2pts each)

1. Write at least four pieces of information about legislative requirements?
2. Describe the main points of workplace requirements?

Note: Satisfactory rating - 6 points **Unsatisfactory - below 6 points**

You can ask you teacher for the copy of the correct answers.

Score = _____

Rating: _____

Operation Sheet 1– Technique of operating oven

Objective: To set the desired baking parameters of oven in order to produce quality baked product.

PPE

- Glove
- Mask
- Guan
- Safety shoes
- Heat resistant glove

1.1 Procedures of operating oven

Step1**.** Place the power switch in the on position. All 8s will flash as a test of the display.

Step 2. Press and hold the set button.

Step 3. Observe the set temperature in the display window (celsius).

Step 4. To decrease the set temperature, press decrease while holding set.

Step 5. To increase the set temperature, press increase while holding set.

Step 6. When the desired set temperature is shown, release the increase or decrease Keys. Finally, release the set key. The oven automatically begins to control at the set temperature.

Step 7. When desired temperature is reached place samples or glassware appropriately inside the oven.

Step 8. When samples are ready or glassware is dry remove them from inside the oven using hot gloves, then move on to shutdown procedure

1.2 Temperature display offset

Step 1. Press MENU button until screen reads “CAL” to access entry of a temperature display offset.

Step 2. Press and hold the SET button while pressing INCREASE or DESCREASE in order to change offset temperature to desired Celsius number.

Step 3. Release the SET button.

Step 4. Press MENU once to return to normal temperature control.

NB. The offset feature permits the operator to measure and calibrate such that the display will indicate the temperature at a specific point or zone within the oven.

LAP TEST	Performance Test

Name…… ID……Date……

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within **10** minutes. The project is expected from each student to do it.

Task 1: Perform procedures operating oven

Task 2: Perform procedures of temperature display offset

LG #25	LO #5- Decorate products to meet quality and customer requirements

Instruction sheet

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- Applying decorating materials
- Presentation requirements of finished product
- Applying typical decorating techniques
- Doing decoration within design specification parameters
- Cooling methods
- Identifying, rectifying or reporting unacceptable product
- Assembling products to meet customer and quality requirements
- Conducting work with workplace information and environmental guidelines.
- Maintaining workplace records with workplace recording requirements

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Apply decorating materials
- Presentation requirements of finished product
- Apply typical decorating techniques
- Do decoration within design specification parameters
- Identify cooling methods
- Identify, rectify or report unacceptable product
- Assemble products to meet customer and quality requirements
- Conduct work with workplace information and environmental guidelines.
- Maintain workplace records with workplace recording requirements

Learning Instructions:
1 Read the specific objectives of this Learning Guide.
2 Follow the instructions described below.
3 Read the information written in the information Sheets
4 Accomplish the Self-checks
5 Perform Operation Sheets
6 Do the “LAP test”

Information Sheet 1- Applying decorating materials

1.1 Introduction

Cake decorating is one of the sugar arts that use icing or frosting and other edible decorative elements to make plain cakes more visually interesting. Alternatively, cakes can be molded and sculpted to resemble three-dimensional persons, places and things. Cakes are decorated to mark a special celebration (such as a birthday or wedding). They can also mark national or religious holidays, or be used to promote commercial enterprises. However, cakes may be baked and decorated for almost any social occasion. A finished cake is often enhanced with icing, or frosting, and toppings such as sprinkles. The frosting of the cake is the proverbial extra bit of goodness. Frosting is usually made from powdered sugar, milk or cream and often flavorings such as vanilla extract or cocoa powder. Some decorators use a rolled fondant icing. Commercial bakeries tend to use lard for the fat, and often whip the lard to introduce air bubbles.

1.2 Icings and Frostings

Icings and frostings are mixtures spread all over the cake to make it more appealing. Though icings and frostings serve the same purpose on cakes, they are different in their respective preparations and ingredients. An icing is either a fluffy or thin mixture. Fluffy icing is a cooked sugar mixture containing egg whites or yolks, stiff enough to spread in swirls on cakes. Thin icing contains only sugar and liquid, cooked or simply spread with a plastic brush. A frosting is a thick mixture which cooked or uncooked, used only on cakes.

- **Types of Frostings**
    - ✓ Uncooked frosting is a mixture made by creaming butter, sugar, small amount of liquid and flavoring. It is also known as butter icing.
    - ✓ Cooked frosting is a combination of sugar and liquid. It is cooked like candy and requires some temperature attention. A good example of cooked frosting is fudge frosting

- **Types of Icing**

✓ **Buttercream**

Butter cream is made by creaming butter until pale with icing sugar, vanilla and milk. This soft, buttery icing can be spread over a cake or piped into patterns. It can also be flavored with color or chocolate and is perfect for small cakes, like cupcakes. Buttercream hardens on refrigeration, and does not keep for more than a few days. Remember to keep this icing cool as it icing melts easily.

✓ **Fondant**

This stiff and shiny icing can be kneaded and rolled out to cover fruit or chocolate mud cakes, often over a layer of marzipan. Since its firmness helps keep cakes fresh, it is often used for big cakes wedding cakes and cakes that require traveling. Fondant can be made at home although it's usually purchased in a ready-to-use block. It comes in white and ivory shades, but can be tinted to any color.

✓ **Meringue**

This typically American-style frosting is made from egg whites, caster sugar and water. It is whipped and then spread with a palette knife onto the cake to create an edible looking icing that looks particularly striking when decorated with fresh flowers. Be warned though, you must act quickly when icing your cake as it sets within moments of coming off the heat.

✓ **Ganache**

This rich chocolate icing is made from either white of dark chocolate and cream. Ganache can look shiny or matte and is also used as a filling or piped into decorations. White chocolate ganache can be tinted. Avoid pairing ganache with a light cake such as a delicate sponge as this thick icing needs a cake that it won't overpower, such as a mud cake or an almond bundt cake.

✓ **Royal Icing**

Often confused with fondant, royal icing is a white meringue-like mixture made from egg whites, acetic acid and icing sugar. Royal icing is easily made at home, and has multiple uses.

✓ **Glazes**

Glaze is a term used to describe a covering that highlight a product to catch the eye of the consumer and entice them to consume the product. A glaze should protect the product from things like migrating moisture from inside the product and from outside air making the product soft. It will also add flavour and eye appeal to the product. Gum Arabic that is used on gingerbreads and heavy honey breads like Basel leckerli will on add shine. There is no flavour added.

1.3 Tools for cake decorating

Piping bags or syringe, and various piping tips. To use a piping bag or syringe, a piping tip is attached to the bag or syringe using a coupler. The bag or syringe is partially filled with icing which is sometimes colored. Using different piping tips and various techniques a cake decorator can make many different designs. Basic decorating tips include open star, closed star, basket weave, round, drop flower, leaf, petal and specialty tips. Fondant icing (also known as sugar paste) and butter cream are used as covering icings and to create decorations. Floral sugar craft or wired sugar flowers are an important part of cake decoration. Cakes for special occasion, such as wedding cakes are traditionally rich fruit cakes that are covered royal icing or sugar paste. They are finished with piped borders and adorned with apiped message, wired sugar flowers, hand-formed fondant flowers, piped flowers or crystallized fruits or flowers such as grapes or violets.

- **Cake tins and bakeware**

Cake tins and bakeware come in many different shapes and sizes. Some pans come with gorgeous designs and shapes like the nordic bundt pans. With such variety all manner of cakes can be created very easily and effectively. Cakes shaped as hearts, stars, squares, semi-circles, and more. But also impressively presented tiered cakes. And for a perfect trick to instantly wow your friends and family. Bake a beautifully shaped cake, and simply add a few elements from this post to complement the design, maybe some figures or shapes as patterns.

Figure 19. Cake tins and bakeware

- **Cake leveler**

The cake-leveler a must have for creating the smooth surface and also in the creation of multi-layered cakes. It will help you very easily trim the top off your cake so that you are left with a perfectly flat, level surface. This is the tool for you. Simple, easy to use and creates a highly professional look.

Figure 20. Cake leveler

- **Icing smoother**

This wonderful and easy-to-use tool will help you create the smooth sides and top to a buttercream or frosted cake that bakeries demand.

Figure 21. Icing smoother

- **Cake turntable stand**

A turntable will give you a consistent position to expertly decorate your cake

Figure 22. Cake turntable stand

- **Cake offset or angled spatula**

Spatulas come in different, shapes, sizes, and angles. Use them to spread the icing over the cakes

Figure 23. Cake offset or angled spatula

- **Roll-N-cut mat**

Working with fondant is a delicate process. The Roll-N-Cut mat allows you to work the fondant while maintaining its pristine appearance: roll it, measure it, cut it. It also helps with those even more intricate tasks like cutting small decoration pieces.

Figure 24. Roll-N-cut mat

- **Dusting pouches**

When you work with fondant, it is essential to dust the surface with caster sugar to prevent the rolling pin from sticking.

Figure 25. Dusting pouches

- **Fondant roller**

These non-sticky fondant rollers help you roll out the fondant icing evenly with perfect thickness. They come in different sizes to suit your requirements.

Figure 26. Fondant Roller

- **Smoothers & edgers**

One of the most challenging steps in cake decoration can become way easier with the right tool: a smoother tool.

Figure 27. Smoothers & edgers

- **Fondant trimmer**

This tool is used for trimming excess fondant from the base of the cake.

Figure 28. Fondant trimmer

- **Cake marker**

It can also be used to mark the sides perfectly, creating guidelines to help you to place your decorations accurately, and evenly. With the cake marker it becomes much simpler to find the center of your cake.

Figure 29. Cake marker

- **Cake decorating brushes**

When shopping for brushes try to find a set that will give you different brush sizes. Simply use food coloring and apply unique, bespoke hand-drawn designs to your cakes.

Figure 30. Cake decorating brushes

- **Cutters and fondant modeling tools**

Create the shapes you want from fondant, sugar craft, gum paste or marzipan, and then apply them to your cake.

Figure 31. Cutters and fondant modeling tools

- **Fondant and gum paste cake tool**

These are tools for modeling fondant and gum paste.

Figure 32. Fondant and gum paste cake tool

- **Water Brush**

When working with fondant or gum paste, water is used to attach the decoration pieces to the covered cake. This water brush makes it an easy and accurate process.

Figure 33.Water Brush

- **Gum paste flowers drying rack**

The drying rack is another helpful tool for your cake decoration kit. It helps to keep your working space organized, optimized and professional. And it also helps to protect your work. After creating your delicate flowers, you need to take special care of them while they dry. The drying rack allows you to hang your wired flowers and leaves upside down. They can dry while maintaining their shape and without becoming marked in any way.

Figure 34. Gum paste flowers drying rack

- **Fondant imprint mat**

Simply imprint your fondant with a beautiful pattern. Perfect for when you are in a hurry but don't want to skimp on the appearance of your cake.

Figure 35. Fondant imprint mat

- **Pastry bags, piping bags or decorating bags**

Figure 36. Pastry bags, piping bags or decorating bags

- **Piping Tips (or tubes)**

This tips used to give the final shape of cake and cookies. A cake decorating supplies list would not be complete without a basic set of tips for your pastry bag.

Figure 37. Piping tips (or tubes)

1.4 Cake decorating tips guide

One of the cake decorator's essential tools are cake decorating tips. They are also called icing tips, cake tips or pastry tips. These tips are mostly available in metal but there are some plastic ones available, too. With just a few these tips you can magically create different effects with your frosting. Just by varying the angle, the pressure and the way you move the tip and you change the look of your borders. There are two kinds of tips: one that you use directly with the pastry bag and one that you use with a plastic coupler. Here in the picture you will see different sizes of cake tips. The big ones, you place it directly inside the pastry bag. The smaller ones are used with the plastic coupler.

1.5 Typical decoration level

Figure 38. Cake decoration type

Self-Check – 1	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Short answer question

1. List some of the equipments used for baking cake and cookies?
2. Describe the different types of cake decoration?

Test I: Write true if the statement is correct and false if the statement is incorrect

1. Cake decorating is one of the sugar arts that use icing or frosting and other edible decorative elements to make plain cakes more visually interesting. (2pts)
2. Icings and frostings are mixtures spread all over the cake to make it more appealing.(2pts)

Note: Satisfactory rating - 8 points Unsatisfactory - below 8 points

You can ask you teacher for the copy of the correct answers.

Score = _____

Rating: _____

Information Sheet 2- Presentation requirements of finished product

2.1 Presentation requirements of finished product

In presenting your baked products, it is also important to know and familiarize the different guidelines in presenting the baked products. Through this, you are making your customers impressed and convinced with your work. You need to remember that one way to make your purchasers loyal to you is that you need to see to it that your product should always be pleasant to look at and is delicious at the same time. In baking, we need to have guidelines in order for us to achieve our goal which is to present high quality baked products.

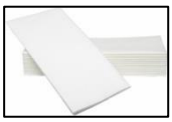
The following are some of the things that will help us in presenting, plating, and serving our baked products:

- Choose the suitable container to the product. Consider its make, size, shape, and decor. It should complement the design, shape, and color of the product.
- Creating transitions between a product like a cake and a plate that is smooth, minimal, or highlighted. A smooth transition can be achieved by choosing a plate with opposing or similar colors as the product. A minimal transition can be achieved by creating a simple line of sauce that mimics a line on a plate. A highlighted transition can be achieved by adding a heavily piped detail to a cake slice. This creates a distinct separation between the cake and the plate.
- Selecting plates or platters with designs around the rim instead of the center that can serve as accent to the products that sit at the center plate or platter.
- Arranging shape combinations of cake, bread, pastry slice on the plate to create a sculptural landscape.
- You can place a thick triangular cake on their edges. Cut a square cake into a rectangle, cut into triangles, then serve one piece upright and the other inverted. Pieces of breads or cakes can create a pyramid or tower by arranging them on top of another.
- Arrange individual pieces of cakes or pastry in paper cups. Paper cups comes in varying sizes, designs, and colors. Use the size, color, design appropriate for the product.

- For buffet, arrange individual cakes on individual plates or in proper cups arranged on trays. They can be also arranged in trays alone. They can also be arranged in slices on trays with proper spacing. Plain cakes can be accented with decors, while lightly decorated ones do not need any accent.
- Baking a cake or pastry in anew vintage bake ware. You can present it in its baking container. You can glaze or put toppings for presentation.
- Wrapping individual unfrosted cakes, pastries, or breads in parchment paper, origami paper, or giftwrap.
- Serve whole cakes for dinner, parties, buffet, or displays on cake pedestals. They stand out, and look elegant and flawless, especially when skillfully sliced or cut. Below are guides in cutting cakes

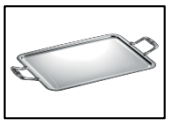
2.2 Equipment for presenting baked products

1. Bowls and Baskets- these come in different sizes and shapes. Breads are commonly presented in open baskets and lined with checkered cotton cloth or plain cloth.



2. Paper napkins – thick, rough textured napkins are good for breads while the smooth, soft, and thin ones are good for dainty cakes and pastries.

3. Paper cups- they are used for serving cakes and muffins. They also come in different sizes, color and texture.



4. Trays- After taking from the oven, product is placed onto cooling wires, decorated and then placed on trays or platters.

5. Pedestal and Cake keepers- pedestals can convert a simple cake or pastry into an immediate show stopper. It elevates products to catch attention.

6. Cellophane Bags- bags are clear and transparent. Product is placed inside the bags to protect from outside contamination and to slow the staling process. Staling is caused by air passing through product and removing moisture. Then moisture evaporates from surface.

7. Boxes- product might be placed into boxes and displayed for sale, lots of 6 or 12. Some boxes might have see through lids.

8. Doilies- Some larger products might be placed on a doily and displayed individually. The role of the doily is to have a barrier under product and protect from surface contamination.

9. Labels- packaged products will have labels showing ingredients, name of manufacturer and other legal requirements. They make good advertising.

10. Glass Vase- used to graciously decorate tray of cookies.

For the vase filling, cut 3 lemons into small and thick slices. Set whole lemons in the glass vase. Now, assemble lemon slices between the glass vase and the whole lemons. Repeat this step until the glass vase is completed. Fill the glass vase with water. Now, lay a plate on the top of the glass with waxed paper and fill with eye-catching spring cookies.

11. Jar- this is one of the easiest ways to add twist on cookie presentation. Fill the jar with colorful spring cookies. Once it is filled, you can add decorations to it.

2.3 Cake presentation occasions

You can be a part of a customer's big day, making it as fun as possible for every- one involved. It all starts with the right cake. With the variety of types, shapes, sizes, and flavors available, cakes are great as a dessert or for a snack anytime.

For every holiday, there's a cake:

- Christmas
- Easter
- Birth day

Figure 39. Birth and holiday presentation of cake

For larger events, there are sheet cakes serving up to 48 slices. These are perfect for:

- Retirement parties
- Graduations
- Family reunions

Figure 40. Graduation type cake

Other celebrations may require anything from a cupcake to a full sheet cake, such as:

- Anniversaries
- Valentine's Day

Figure 41. Presentation of cake

Self-Check – 2	Written test

Name…… ID……. Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I. Choose the best answer

3. Which one of the following occasions presented on the cake surface (3pts)
   a. Birth day
   b. Anniversary
   c. Congratulation
   d. All of the above

Test II. Short answer question (2pts)

3. Write some of the equipments used for serving bake product?
4. Describe the presentation occasions of cake?

Note: Satisfactory rating - 6 points Unsatisfactory - below 6 points

You can ask you teacher for the copy of the correct answers.

Score = _____

Rating: _____

Information Sheet 3- Applying typical decorating techniques

3.1 Typical decorating techniques

- **Fillings**

In addition to icings, fillings can be spread between cake layers. They can complement many cake flavors and often are a substitute “icing” between two or more cake layers. Fillings can include icings, crèmes, fruit, and custards. Fruit fi llings contain fruit and sugar or corn syrup. Flavors include raspberry, apricot, lemon or strawberry, among others. Even a Bavarian crème or custard can be used for a filling.

Figure 42. Cake fillings

- **Frosting**

Frosting is a sweet topping that accompanies many baked goods, especially desserts. In its most basic form, frosting is the combination of sugar and some liquid such as water or milk, but there are hundreds of variations of frosting including blends of egg whites, butter, and a multitude of flavorings and colors.

The primary functions of frosting are to improve:

- ✓ Flavor
- ✓ Appearance
- ✓ Quality by providing a protective coating

Figure 43. Cake frosting

- **Finishing**
  - ✓ Glazing – adding shine or coating to protect the produce, add flavour, e.g. Black Forest gateaux glazed with syrup stock flavoured with Kirsch Basic sugar work e.g. a spun cage that can be placed over fruit tarts to add texture and flavour.
  - ✓ Piping – using a piping bag and different sized and shaped nozzles, decorate or fill products, e.g. whipped cream piped around the bottom of a cake to cover where the cake meets the board.
  - ✓ Icing – used to cover products and to pipe onto products or use fondant icing to make items to create a design. Icing can be coloured using food colouring, e.g. when covering a Christmas cake and making green holly and ivy leaves to decorate the sides and pipe ‘Happy Christmas’ on the top.
  - ✓ Dipping – products are partially or fully submerged into icing, a glaze or chocolate to finish the products, e.g. hazelnuts dipped in caramel and used to decorate chocolate and hazelnut millefeuille

- ✓ Dusting/dredging/sprinkling – when the final product is finished with a fine coating of additional food items to give colour/flavour to the texture, e.g. toasted almonds and icing sugar used to finish a gateau paris-brest
- ✓ Cutting – when working with pastillage, shapes can be cut out and used to decorate products
- ✓ Rolling – using a rolling pin to roll paste to the size, shape and thickness needed, e.g. rolling fondant icing out to cover a cake, rolling out Pastillage.
- ✓ Assembling – when all the products needed are brought together and put together to create the final product.

Self-Check – 3	Written test

Name…… ID……. Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test: Short answer question (2pts each)

4. List typical decoration techniques
5. Describe the primary functions of frosting

Test II: Write true if the statement is correct and false if the statement is incorrect

5. Frosting is a sweet topping that accompanies many baked goods, especially desserts. (2pts)

Note: Satisfactory rating - 6 points Unsatisfactory - below 6 points

You can ask you teacher for the copy of the correct answers.

Score = _____

Rating: _____

Information Sheet 4 - Doing decoration within design specification parameters

4.1 Decoration design

Design specification tells what is required, what the product is e.g. wedding cake, celebration cake

- Size
- Shape
- Assembly/construction, e.g. batten/stands
- Pictures or drawings of the design

Storage requirements for finishes e.g. glazes, icing, and chocolate - example:

- Temperature controlled
- Humidity controlled
- Packaging to prevent damage
- Covered
- Labelled, dated will need to be done before service – e.g. add chocolate shards

4.2 Type of decorate design

- **Fresh Flowers**

Fresh flowers add life and vibrance to your wedding cake and we are happy to work with your florist to create a custom flower arrangement. Fresh flowers are provided by your florist and need to be delivered to the bakery the day before the wedding. Please carefully discuss flower options with your florist as certain flowers may have high toxicity and/or contain pesticides.

Figure 44: Fresh flowers

- **Buttercream flowers**

Buttercream Flowers are edible, may be tinted in an array of colors, and made from rich decorator's buttercream. Our most popular design is rose sprays with leaves, vines, and supporting flowers

Figure 45. Buttercream flowers

- **Sugar-paste Flowers**

Sugar paste flowers are handmade and painted. They are composed of sugar dough that dries hard and brittle. They can look extremely life-like or abstract. We have a wide selection of flowers and colors available as an upgrade. Pricing depends on the flower and bouquet type.

Figure 46. Sugar-paste Flowers

- **Cake Toppers**

Cake toppers are available in a wide range of styles and designs; they can be elegant, romantic, or comical. Flowers can cascade down or be set in equally divided segments of the cake. Below and on the next page illustrate some popular arrangements.

Figure 47. Cake Toppers

- **Floral Arrangement**

The floral arrangement typically matches the bride's bouquet or reception colors. Alternatively, it can have a one-color theme. They can be arranged as a cake topper or a floral piece made to go between tiers. Flowers can cascade down or be set in equally divided segments of the cake. Below and on the next page illustrate some popular arrangements.

Figure 48. Floral Arrangement

- **Alternative Decorations**

Below and on the next page are a few of the more popular alternatives to the traditional wedding cake. Many styles and designs are possible. Do not feel limited by the information we have provided you with. We enjoy being creative and encourage you to do the same.

✓ **Beach Theme**

A beach themed wedding cake can be created using chocolate, sugar, or plastic seashells and other decorations.

Figure 49. Beach Theme

✓ **Pastillage**

Pastillage is sugar-based dough used to make edible decorations. They are formed or molded into the desired shapes, dried overnight, and then colored or painted.

Figure 50. Pastillage

- ✓ **Fondant**

Fondant decorations are made with the same fondant used to ice a wedding cake. They can be an array of colors and designs such as polka dots, stripes, vintage flowers, and drapes.

Figure 51. Fondant

Self-Check – 4	Written test

Name…… ID……. Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Short answer question (2pts each)

6. List the design specification of cake?
7. Write types of cake décor?

Note: Satisfactory rating – 4 points **Unsatisfactory -4 below points**

You can ask you teacher for the copy of the correct answers.

Score = _____

Rating: _____

Information Sheet 5- Cooling methods

5.1 Cooling methods

Cakes need to cool properly before they're handled. First, allow cakes to cool in their pans for a while. If a cake hasn't cooled enough, it will be quite reluctant to leave the pan some of the cakes may stick to the pan, or half of the cake will come out, and the other half will stay attached. Removing a cake from the pan too soon or too late can drastically change the appearance and texture of the cake. Wire cooling racks are perfect for cake to cool on after they're removed from baking pans, because the wire cooling racks allow air to circulate all around the cakes while it cools.

Some kinds of cakes require specific cooling techniques, such as:

- **Butter cakes:** After removing butter cakes from the oven, let them stand in the baking pans on wire cooling racks for 10 minutes, or as the cake recipe directs. Run a knife around the edge of the cake to loosen it from the sides of the baking pan. Using oven mitts or hot pads, place a wire cooling rack on top of the cake and baking pan. Turning cake over so wire cooling rack is on the bottom. Gently shake the cake to release it from the baking pan. Remove the baking pan and peel off the paper liner from the cake, if one was used. Turn the cake right side up onto a second rack to finish cooling. If you let the cake cool in the pan too long, it may not come out easily. Try putting it back in the oven at 250°F for three minutes to help loosen it. For greater success in removing the cake from the pan use pan release.

  Pan Release uses a combination of ingredients that you generally have on hand and can be kept in the refrigerator to use anytime you need to grease bakeware. There generally is no need to run a knife around the edge of the pan before removing the cake. It will just slide out without leaving any crumbs in the pan or on the sides of the cake.

- **Sponge or angel food cakes:** Sponges and angel food cakes are leavened with air, so they have to cool hanging upside down or they will collapse into themselves. The easiest way is to use a pan that has feet attached to the pan.

Just flip around the feet, and turn the cake upside down. Allow the cake to completely cool for several hours. Then remove the pan from the bottle and slide a sharp knife with a long, thin blade between the cake and side of the pan to free any sticking crumbs. Place a plate over the top of the tube pan, flip it over, and remove the pan.

- **Cheesecakes:** Allowing the cheesecake to fully set before removing the spring form pan is important. Cool the cheesecake on a wire rack away from drafts at least 1 hour until it reaches room temperature. Then cover the top of the pan with plastic wrap and place it in the refrigerator to set for at least four hours -- overnight is ideal. After the cheesecake is completely chilled, run a butter knife between the cake and the edge of the pan, unlatch the fastener, gently release the spring form ring, and lift straight up, away from the cheesecake.

5.2 Cooling methods

5.2.1 Vacuum cooling

Vacuum cooling is a relatively new technology which is characterized by its ability to reduce the difference between ambient atmospheric pressure and water vapour pressure. The vacuum system uses pumps which remove the gases and water vapour from the cooling chamber, creating a partial vacuum or zone of very low manometric pressure. This accelerates the vaporization of free moisture from the product. Vacuum cooling is a rapid method that is suitable for products that are unstable and prone to collapse as they cool. Vacuum cooling allows bakeries to avoid the dependence on prevailing atmospheric conditions, achieving consistent results and uniform cooling at all times. Equipment required for this purpose must be isolated and sealed from the surrounding area and may be batch- or tunnel-type

5.2.2 Cooling a cake on a cooling rack

Cooling racks are an essential tool for any baker as they help your cake cool evenly and quickly. Here are a few things to consider

- Pick a wire rack that is easy to fit in your dishwasher and in the area you plan to store it.

- Cooling racks work by allowing air to circulate under your cake, which helps prevent condensation which could make the bottom soggy.

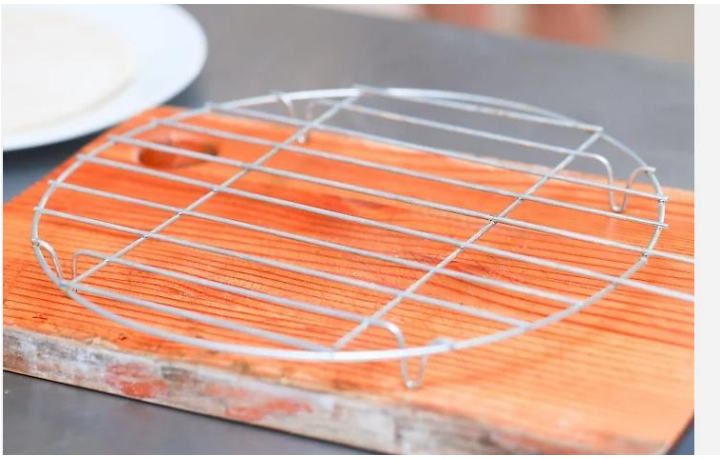


Figure 52. Cooling rack

Self-Check – 5	Written test

Name…… ID……. Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Short answer question (3 pts each)

1. Type some of the cooling requirements of bakery product?

Note: Satisfactory rating - 3 points **Unsatisfactory - below 3 points**

You can ask you teacher for the copy of the correct answers.

Score = _____

Rating: _____

Information Sheet 6 - Identifying, rectifying or reporting unacceptable product

6.1 Common cake problems and solutions

It is often the case that cakes are made that are not up to the required standard. When this happens, it is important to be able to identify what went wrong so that you do not make the same mistake again. What follows is a list of the most common faults and their causes.

- **Cake is sunk in the middle**

Most of the causes of a sunken cake are concerned with recipe imbalance. Too much of a certain ingredient can cause the cake to rise quickly but then collapse (e.g. too much baking powder) or can result from an imbalanced recipe preventing sufficient air being beaten into the mixture (e.g. flour too soft, too much fat). The most common causes are as follows:

- ✓ Too much baking powder
- ✓ Too much sugar (this will be apparent if the cake also has a crisp, sugary crust)
- ✓ Too much fat/margarine
- ✓ Flour too soft
- ✓ Cake was knocked in the oven before it had set

- **Cake is collapsing at the sides**

This is also called the "X" fault on account of the shape of the cake after it is baked. Most often, the cause is too much liquid in the batter inhibiting the batter from rising evenly.

- **Fruit is sinking in the cake**

This is a very common problem and one that can have a number of causes. Usually, it is either to do with the fruit or the batter. The most common causes are:

- ✓ The flour is too soft
- ✓ The batter is too soft

- ✓ The batter is too lightly aerated (either from overmixing or from too much baking powder)
- ✓ The fruit is wet and therefore heavy (especially cherries)

- **Cake is too small**

This is also a very common problem and again one with a number of potential causes, the most common of which are as follows:

- ✓ Insufficient aeration (from under mixing or not enough baking powder)
- ✓ The batter is too stiff
- ✓ The flour is too strong
- ✓ The batter is toughened (from overmixing or from recipe imbalance)
- ✓ The oven is too hot (which leads to the cake being "gripped" and stunted)

- **Badly cracked tops**

The cause of this is that the oven is too hot, and the crust of the cake forms while the cake is still rising, leading to the crust "bursting."

- **Peaked top**

This is usually caused by a tough batter, which is caused by overmixing and is often accompanied by a long hole in the cake.

- **Wet streak at the base of the cake**

This is caused by too much liquid, with the excess liquid in the recipe left as residue at the base.

- **Cake staling quickly**

This has a number of causes:

- ✓ Oven too cold so the cakes are in the oven too long, and the crumb dries out
- ✓ Too much baking powder
- ✓ Not enough liquid in the batter to keep the cake moist

- **Sugary tops or white spots on cakes**

The causes are as follows:

- ✓ Too much sugar
- ✓ Not enough liquid (to dissolve the sugar)
- ✓ Sugar too coarse (to be fully dissolved)
- ✓ Cakes standing too long before going in the oven. This allows moisture to escape from the top of the cake and leaves sugar residue in the batter.

- **Curdled cake batter**

Fat and water do not mix normally, and in a cake batter that contains fat and water (in the eggs) there is a natural tendency for curdling, or the breaking down of the emulsion of fat and eggs. If a cake batter curdles, the resulting cakes are often still acceptable, though smaller than usual. Curdling will occur if:

- ✓ The eggs are added too soon before the fat and sugar have been creamed
- ✓ The eggs are added cold, as this causes the fat to harden again and accept no more eggs. Egg temperature should be approximately 72F (21 Centigrade)
- ✓ The eggs are added in too large an amount at once. Eggs should always be added slowly and gradually.

6.2 Common cookies faults

- **Flat, rock hard cookies**

If your cookies look like the first one in the above picture, it's probably because the dough contained too much sugar leaving your biscuit overly crunchy (as in don't feed them to grandpa) and dark brown. They probably also got stuck to the baking sheet. Ease up on the sugar in the recipe.

- **Dry and stiff cookies**

The excess flour caused too much gluten to form, preventing the cookie from softening and spreading.

- **Dark and crispy cookies**

If your cookies came out resembling the third one in the biscuit line up of shame, it's likely that they were made from good dough, but either baked for too long or at too high a temperature. So, they probably came out of the oven too brown and too hard. Try removing your cookies from the oven sooner, or perhaps invest in an oven thermometer to check that your oven temperatures are accurate.

- **Crispy on the outside, raw on the inside**

The dough wasn't cool enough before baking. Warm cookie dough or excess butter will cause the cookies to spread too much, baking quickly on the outside but remaining raw in the middle. Next time, chill your cookies in the fridge for 10 minutes before you bake them. If the problem persists, use less butter.

Table 5. Typical faults occur in cake processing and possible causes

Defect	**Cause**	**Remedy**
Layers Uneven /Uneven Cake	• Batter spread unevenly • Oven trays out of balance • Cake tins warped	• Spread batter evenly • Adjust oven trays • Do not use damaged tins
Cake peaks in the center	• Insufficient shortening • Batter too stiff • Too much oven top heat	• Balance recipe • Increase moisture or decrease flour content • Adjust oven top heat
Cakes sag in the center Poor symmetry	• Excessive sugar in the cake • Insufficient structure building materials • Too much leavening • Cold oven • Cakes under baked	• Balance recipe • Increase egg content and/or flour content • Adjust the leavening • Correct oven temperature • Bake thoroughly

Undersized Cakes	• Unbalanced cake recipe • Oven too hot • Oven too cold • Improper mixing • Cake tins too large for the batter size	• Adjust cake recipe • Check oven temperature • Check oven temperature • Mix properly • Use a proper amount of batter
Dark Crust Colour	• Oven too hot • Too much top heat in the oven • Too much sugar, too much milk solids	• Use correct baking temperature • Adjust top heat in the oven • Check cake recipe
Light Crust Colour	• Oven too cold • Unbalanced recipe	• Raise oven temperature • Balance recipe

Self-Check – 6	Written test

Name…… ID……. Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Short answer question (3pts each)

1. Write the typical faults in cake?
2. Describe some of the common unacceptable cookies?

Note: Satisfactory rating - 6 points **Unsatisfactory - below 6 points**

You can ask you teacher for the copy of the correct answers.

Score = _____

Rating: _____

Information Sheet 7- Assembling products to meet customer and quality requirements

7.1 Assembling products

Assembling products bakery products helps to come together different ingredients and decoration materials to give final delicate and sensory attractive bakery products. This section deals with simple style of cakes. Typical examples of this type are cup- cakes, sheet cakes, and layer cakes made of two or three high-ratio or butter-cake layers. These are popular items in bakeshops and are standard desserts in many food service operations. They may be iced but otherwise undecorated, or they may be given some decorative touches.

- **Planning the cake**

Most cakes have up to four components:

- ✓ Cake
- ✓ Icing
- ✓ Filling
- ✓ Décor

The simplest cakes have only the first two of these components: cake and icing. For example, the simplest sheet cake consists of only a single layer of cake topped by a single layer of icing. Simple layer cakes have two or three layers of cake, with icing between the layers and the same icing on the top and sides. In a slightly more complex cake, the filling between the layers may be different from the icing on the outside of the cake. Finally, a cake may be decorated with additional elements as décor, such as fruit and nuts. When planning a cake, a pastry chef must consider the characteristics of each of these four components in order to produce an appealing and attractive cake. In particular, the chef should take into account the following characteristics:

- Flavor
- Color
- Texture

- Shape

Cake layers, icings, and fillings come in an endless variety of flavors, colors, and textures. The fourth characteristic, shape, applies primarily to the cake layers (round, rectangular, novelty cutout) and to the décor elements. When matching flavors and textures of cake, icing, and filling, select combinations that complement each other (such as chocolate icing and chocolate cake) or that make a pleasing contrast (such as raspberry filling in chocolate cake).

Self-Check – 7	Written test

Name…… ID……. Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I. Short answer question (2pts each

1. Write the quality characteristics consider during assembly?
2. Discus the on components of cake

Test II. Write true if the statement is correct and false if the statement is incorrect

1. Assembling cake considers the final sensory quality of cakes(2pts)

Note: Satisfactory rating - 6 points Unsatisfactory - below 6 points

You can ask you teacher for the copy of the correct answers.

Score = _____

Rating: _____

Information Sheet 8- Conducting work with workplace information and environmental guidelines

8.1 Work place environmental guidelines

Workplace hazards include things such as slippery floors, loose floor mats, and sharp knives, as well as hazardous materials. It is important for all employees to be aware of hazards, even if they seem obvious. Employers should provide information and training on any safe work procedures related to the job site. Safe work procedures are specific directions for doing a task or operating equipment that may pose a risk or hazard to the worker. Workers should always ask their supervisor if there are any safe work procedures they need to be aware of and/or any written instructions they should be following. one of the main hazards in any workplace are cleaning products, some of which are everyday products that a person may not regard as hazardous, such as sanitizers and household cleansers. Cleaning products and all other materials that are potentially hazardous are governed by the workplace hazardous materials information system.

8.2 Legislative requirements

Supplier labels When a supplier produces or imports a product for distribution and sale, that supplier must prepare a label that provides the following seven pieces of Information:

- ✓ Product identification
- ✓ Supplier identification
- ✓ Hazard symbols
- ✓ Risk phrases
- ✓ Precautionary statements
- ✓ First aid measures
- ✓ A statement advising that an MSDS is available

8.3 Work place requirements

• **Work Layout**: The layout of the workplace is required to allow persons to enter and exit the workplace and move within safely, both under normal work conditions and in an emergency.

• **Entry and Exit**: Entries and exits are required to be safe to allow impeded access and egress for all workers, students and visitors including those with special needs. In particular:

- ✓ entries and exits should be slip resistant under wet and dry conditions
- ✓ aisles and walkways need to be at least 600mm wide and kept free of furniture or other obstructions
- ✓ any walkways, boundaries or pathways shall be marked with 50mm wide with a contrasting colour e.g. white or yellow
- ✓ open sides of staircases should be guarded with an upper rail at 900mm or higher and a lower rail
- ✓ handrail should be provided on or at least one side of every staircase
- ✓ separate entry and exits for mobile equipment e.g. forklifts or trucks, and pedestrians are to be provided
- ✓ Power operated doors and gates should have safety features to prevent

- **Work Areas** The layout of the work area should be designed to provide sufficient clear space between furniture, fixtures and fittings so workers can move freely without strain or injury also evacuate quickly in case of an emergency. In determining how much space is required, the following should be considered:
  - ✓ the physical actions needed to perform the task
  - ✓ the need to move around while working
  - ✓ whether the task is to be performed from a sitting or standing position
  - ✓ access to workstations
  - ✓ the equipment to be handled and the personal protective equipment that may be worn.

- **Floors and Other Surfaces** Floor surfaces shall be suitable for the work area and be chosen based on the type of work being carried out at the workplace, as well as

the materials used during the work process, the likelihood of spills and other contaminants, including dust and the need for cleaning. In general:

- ✓ floors shall be free from slip or trip hazards e.g. cables, uneven edges, broken surfaces
- ✓ floor surfaces shall have sufficient grip to prevent slipping, especially in areas that may become wet or contaminated
- ✓ anti-fatigue matting, carpet, shock absorbent underlay, cushion backed vinyl shall be provided for workers where static standing occurs
- ✓ carpet shall be properly laid without loose edges or ripples and should be well maintained
- ✓ Floors should be strong enough to support loads placed on them

- **Workstations** Workstations should be designed so workers are comfortable undertaking their task and allow for a combination of sit and standing tasks. For tasks undertaken in a seated position, workers should be provided with seating that:

  - ✓ Provides good body support, especially for the lower back
  - ✓ Provides foot support, preferable with both feet flat on the floor, otherwise footrest shall be provided
  - ✓ Allows adequate space for leg clearance and freedom of movement
  - ✓ Fully adjustable to accommodate different size workers (e.g. Seat height, back rest height and back rest tilt adjustments) and should not tip or slip utilizing a five-point-base
  - ✓ Chairs shall be fitted with castors for carpeted surfaces and glides or braked castors on hard surfaces

• **Lighting** Sufficient lighting is required to allow safe movement around the workplace and to allow workers to perform their job without having to adopt awkward postures or strain their eyes to see. Emergency lighting is to be provided for the safe evacuation of people in the event of an emergency. The following factors are to be taken into account:

- ✓ The nature of the work activity
- ✓ The nature of hazards and risk in the workplace

- ✓ The work environment
- ✓ Illumination levels, including both natural and artificial light
- ✓ The transition of natural light over the day
- ✓ Glare

- **Air Quality** Workplace are to be adequately ventilated which includes provision of fresh, clean air drawn from outside the workplace, uncontaminated from flues or other outlets and be circulated through the workplace. Workplace inside buildings may have natural ventilation, mechanical ventilation or air conditioning. An air-conditioning system should:
  - ✓ Provide a comfortable environment in relation to air temperature, humidity and air movement
  - ✓ Prevent the excessive accumulation of odors

Reduce the levels of respiratory by-products, especially carbon dioxide, and other indoor contaminants that may arise from work activities.

8.4 Workplace information

- Verbal or written instructions
- Standard operating procedures (sops)
- Specifications
- Production schedules recipe instructions

Self-Check – 8	Written test

Name…… ID……. Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Short Answer Questions (3 points each)

1. Write the legislative requirements of food labels?
2. Describe some of the work place hazards?
3. List different legislative requirements of food?

Note: Satisfactory rating - 9 points **Unsatisfactory - below 9 points**

You can ask you teacher for the copy of the correct answers.

Score = _____

Rating: _____

Information Sheet 9- Maintaining workplace records with workplace recording requirements

9.1 Maintaining workplace records

Records/reports records provide evidence that the relevant specifications and /or instructions have been complied with. Records should be made or completed at the time each action is taken. Any change to a record should be approved, signed and dated by authorized persons.

The level of documentation will vary depending on the product and stage of development. The records should enable the entire history of a batch to be traced. Additionally, the records/reports should form the basis for assessment of the suitability for certification and release of a particular batch.

As a minimum, the following should be documented:

- Receipt records for each delivery of raw materials, starting material, bulk, intermediate as well as primary packaging materials.
- The receipt records should include: - name of the material on the delivery note and the containers as well as any “in house name” and or internal code if appropriate, supplier’s name and manufacturer’s name supplier’s batch or reference number total quantity received
- Date of receipt unique receipt number assigned after receipt; and any relevant comment.

A batch processing record should be kept for each batch processed; it should contain the following information:

- Name of the product and batch number;
- Dates and times of commencement, of critical intermediate stages, and of completion of production;
- Quantities and batch number of each starting material;
- Quantities and batch number of critical raw materials

9.2 Documentation & Records

Appropriate documentation & records including incoming material checks, inspection and testing, calibration of food safety equipment, water testing, operational controls (such as temperature, pressure, time etc.), product recall and traceability, storage, cleaning and sanitation, pest control, medical examination and health status of food handlers, training etc. shall be maintained in a legible manner, retained in good condition for a period of one year or the shelf life of the product whichever is more.

Any changes to records should be traceable (for example, errors are identified by a strike out and followed by initials). Each entry on a record should be signed and dated by the responsible person at the time the specific event occurred.

- Record-keeping requirements and responsibilities should be communicated to staff.
- Records should be kept in a secure location, maintained and readily available for a period of one year or shelf life, whichever is more.

9.3 Record keeping systems

There are certain written records or kinds of documentation that are needed in order to verify that the system is working. These records will normally involve the Implementing Hazard Analysis and Critical Control Point (HACCP) plan itself and any monitoring, corrective action, or calibration records produced in the operation of the Hazard Analysis and Critical Control Point (HACCP) system. Verification records may also be included. Records maintained in a HACCP system serve to document that an ongoing, effective system is in place. Record keeping should be as simple as possible in order to make it more likely that employees will have the time to keep the records.

9.4 The purpose of records

Accurate record keeping is essential to the application of a preventive control plan. Your records should be sufficient to enable you to confirm easily and with confidence that your preventive control plan is implemented and working effectively. Records can also help you improve your preventive control plan by providing a means for you to, for example:

- Identify the root cause of an issue
- Analyze and improve a process or procedure
- Identify gaps in training and in training needs

The following make up the records of a Hazard Analysis and Critical Control Point (HACCP) Plan

- List of HACCP team and their assigned responsibilities
- Description of each menu item
- Flow diagram for each menu item indicating CCPs
- Hazards associated with each CCP and preventive measures
- Critical limits
- Monitoring procedures
- Corrective actions plans
- Record keeping procedures
- Procedures for verification of the HACCP plan
- Production process
- Variation of results

Self-Check – 9	Written test

Name…… ID……. Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Short answer questions (3 point each)

1. List the required documentation in document recording procedures?
2. Write appropriate documentation of policies and procedures to be applied by the manufacturer?
3. Describe record keeping and documentation activities?

Note: Satisfactory rating - 9 points **Unsatisfactory - below 9 points**

You can ask you teacher for the copy of the correct answers.

Score = _____

Rating: _____

Operation Sheet 1– Technique of decorating cake

Objective: To produce quality cake with different types of design and sensory quality to meet the desire quality of customers

PPE

- Glove
- Mask
- Guan
- Safety shoes
- Heat resistant glove

Tools and equipment

- Mixing bowls
- Measuring jugs
- Spoons
- Spatulas
- Palette knives
- Rolling pins
- Cutters
- Scraper
- Piping bag and nozzles
- Moulds
- Scales
- Sieve
- Whisks
- Brush
- Mixer
- Saucepan

1.1 Procedures of decorating cake

Step. Prep the turntable

- Place a small, damp washcloth or paper towel on top of the turntable.
- The washcloth keeps the board from shifting as you are spinning the turntable while decorating.

Step 2. Apply the first cake layer

- Place a prepared cake round on top of the cake board.
- Make sure it is centered on the board.
- Spread a small amount of frosting on the middle of the board, then place the bottom cake layer on top.

Step 3. Apply the filling

- Place a large dollop of your chosen filling or frosting in the center of the first layer.
- Spread the filling evenly with an offset spatula until it reaches a little past the edges.

Step 4. Apply the second cake layer

- Place the other prepared cake round on top of the filling.
- Align it with the bottom layer, making sure the sides line up together.
- Press down gently on the top layer to impress it onto the filling evenly.

Step 5. Apply the crumb coating

Step 6. Apply the top layer of icing

- Spread around the top with an offset spatula until it is completely covered with an even, thick layer.
- Use the turntable to spin it around as you push excess icing towards the edges.

Step 7. Fix the edges and smooth the sides

- Use the edge of an offset spatula or metal bench scraper, lightly press down and push the icing towards the center, blending the excess with the rest of the icing.

Step 8. Pipe the borders

- Place the end of the tip at a 45° angle where the bottom of the cake meets the board.
- Pressing gently on the bag in one short burst, pipe out the desired shape, releasing pressure as you pull the bag away.
- Place the end of the tip close to the edge on top, at a little less than a 90° angle.

Step 9. Add garnishes

- Apply your desired garnishes before storing the finished dessert in the refrigerator. If it is chilled before garnishing, the icing will be too solid for the decorations to stick.

Step 10. Serve and store

- A decorated cake is best served at room temperature the icing and cake will have a chance to soften to the most enjoyable temperature and consistency.

Operation Sheet 2– Technique of assembling of cake

Objective: To produce quality cake with different types of design and sensory quality to meet the desire quality of customers.

PPE

- Glove
- Mask
- Guan
- Safety shoes
- Heat resistant glove

2.1 Procedures of assembling of cake

Step 1: Trim the Cake

- Place one layer on an 8-inch cardboard round; place the round on the turntable, securing it with a dab of buttercream. With a long serrated knife, trim tops off both cake layers to make flat surfaces.

Step 2: Spread filling

- Use a small offset spatula, evenly cover the top of the first layer with 1 cup of buttercream.
- Spread the buttercream so it extends beyond the edges of the cake.

Step 3: Crumb Coat

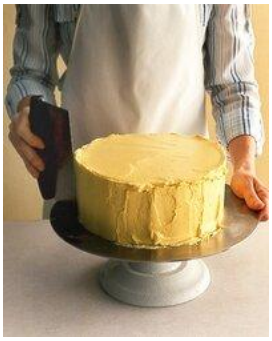
- Place the other cake layer, with the cut side down, on top of the buttercream; press gently to make it level.
- Spread the cake with 1 1/2 cups more of the buttercream, plus any oozing out from between the layers, creating a "crumb coat," a thin layer of frosting that seals in the crumbs.
- Refrigerate the cake for 15 minutes.

Step 4: Frost the Cake

- Use a large offset spatula, generously coat the chilled cake with 2 1/2 cups of buttercream, frosting the top of the cake first.
- Hold the spatula at a 45-degree angle against the cake

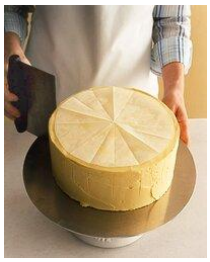
Step 5: Smooth Frosting

- Use a bench scraper to smooth the sides of the cake.
- Hold the scraper perpendicular to the cake with one edge resting on the turntable and slowly rotate the turntable
- Refrigerate the cake for 30 minutes.



Step 6: Mark Cutting Lines

- Cut an 8-inch round from parchment paper.
- Fold the round into 16 equal wedges by folding it in half 4 times.
- Unfold, and place the paper on top of the chilled cake.
- Use the fold lines as a guide; lightly mark 16 vertical lines around the sides of cake with the bench scraper.



LAP TEST	Performance Test

Name…… ID……Date……

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within **4hrs**. The project is expected from each student to do it.

Task 1: Perform procedures cake decoration

Task 2: Perform the procedures of assembling cake

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