

Student workbook

Biscuits and cookies

Unit code: FBPRBK3009

Unit name: Produce biscuit and cookie products



TAFE NSW would like to pay our respect and acknowledge Aboriginal and Torres Strait Islander Peoples as the Traditional Custodians of the Land, Rivers and Sea. We acknowledge and pay our respect to the Elders, both past and present of all Nations.

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Getting started

Welcome to unit FBPRBK3009 Produce biscuit and cookie products.

This Learner Workbook will provide you with the knowledge you need to be able to produce sponge products. Throughout the workbook you have been provided with activities to support your learning, and practical tasks to apply your baking skills. You will be practicing your skills and knowledge in a Bakery at either your Workplace or at your TAFE Campus. If you have any questions along the way, don't forget to ask your teacher for assistance.

To enable you to work your way through this guide you will be required to do some mathematics using a calculator. If you have any doubt about your ability with reading, writing or mathematics it would be a good idea to discuss this with your trainer, assessor or employer.

You will find assessment instructions for this unit in the Unit Assessment Guide.

This unit will be delivered over six weeks.

At the very end of the Learner Workbook, you will find a glossary which is a list of terms used in Baking. If you find a term you are unfamiliar with in your reading, check the glossary.

Happy learning!

What will I be doing?

- Reading information in this Learner Guide.
- Referring to the Bakery Moodle and the Virtual Enterprise.
- Making notes.
- Following your teacher's instructions about practical activities and questions in the Learner Workbook.

Learning outcomes

Throughout this unit you will learn the skills needed to produce basic biscuit and cookie products in a commercial baking environment including:

- How to prepare your work areas and yourself for work.
- How to demonstrate a range of hand and machine skills to make biscuit and cookie products.
- How to identify a range of bakery ingredients and products.

- The roles that the ingredients play in making biscuit and cookie products.
- How to safely use bakery equipment, and hygienically produce biscuit and cookie products.
- How to mix, form, process and bake biscuit and cookie products.
- How to package and store biscuit and cookie products.
- How to pack up and clean up after bakery work.

Topics

There are nine topics to complete within this learner guide.

Topic number	Topic name
Topic 1	Preparing for work
Topic 2	Equipment used to produce sponge products
Topic 3	Ingredients used for making sponge products
Topic 4	Mixing and production methods
Topic 5	Baking sponge products
Topic 6	Decorating and finishing sponge products
Topic 5	Quality and faults
Topic 6	Pack up and clean down
Topic 7	Finishing and decoration techniques
Topic 8	Quality and fault detection
Topic 9	Packing up and cleaning down

As you work through the topics in this unit you will be asked to repeat the following tasks for each step of the process.

When you see these symbols throughout this workbook (see icon legends table), you will know you can refer back to this section for more information.



Measure ingredient quantities to meet recipe, formula and production schedule specifications

Baking requires accuracy. Miscalculations can produce unwanted results and waste. All dry ingredients should be weighed (weight) rather than measured (volume). You should use good quality digital scales that have been maintained and tested to ensure accuracy. Your workplace will have a system of regularly checking the accuracy of scales by using weights. If there is a discrepancy, the scales should be serviced and re-calibrated.

Temperature is also very important in baking and at various times in the baking preparation and process you will need to measure and check temperature.

The Australian Government also has trade measurement laws which must be followed. You will find more information about this in the [Australian Government National Measurement Institute - Guide to the sale of bread and bakery products](#).

You will learn techniques for calculating yields, adjusting recipes, converting units of measurement and measuring ingredients.



Check products to identify faults and rectify

Checking and monitoring your products throughout the preparation and baking processes will ensure the product meets the expected standard. If the product made does not meet the standard of your workplace, and cannot be sold, it will be costly for your employer. To prevent this, you should check and monitor the preparation, mixing, processing and baking stages of making your biscuits and cookies.

Checking may be as simple as inspecting doughs and batters to make sure it is mixing to meet the product requirements, or that after dividing and moulding all your pieces are the right size and shape. You can then make adjustments, such as changing speed or timing on a mixer, or making a change to the shape of a dough piece.

Checking and rectifying faults are important during all processes of making biscuits and cookies. You will learn to recognise when things don't go as expected.

Variations will occur for many reasons:

- Different quality of ingredients
- Different brands of ingredients
- Inaccurate weighing of ingredients
- Using the wrong ingredient
- Incorrect mixing technique
- Incorrect equipment used
- Incorrect temperature and timing
- Incorrect processing (proofing, retarding, finishing)
- Oven temperatures/settings which are not appropriate for the product being made

If a finished product does not meet expectations, you will need to record that on the production schedule (see below for an explanation) as this may indicate a problem with the recipe formula, equipment or ingredients.

Throughout the duration of the course, your teacher will explain this in more detail and will provide opportunities for practising this form of problem solving.



Maintain records

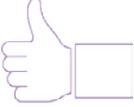
You will need to know the product types and amount that you will be producing whenever you start work. Your workplace will use a production schedule to clarify what needs to be produced. You will find an example of a production schedule throughout this guide and there is one in the appendices section at the back of the learning workbook.

The production schedule may include the following:

- Date/day/time of production
- The baker who made the batch of products
- Baking parameters and time
- Yield
- Storage requirements
- Variations to formulations
- Outcome/quality

Icon legends

Icons	Descriptions
	<p>Practice activity</p> <p>Learning activities are the tasks and exercises that assist you in gaining a clear understanding of the content in this workbook. It is important for you to undertake these activities, as they will enhance your learning.</p> <p>Activities can be used to prepare you for assessments. Refer to the assessments before you commence so that you are aware which activities will assist you in completing your assessments.</p>
	<p>Collaboration</p> <p>Whether you discuss your learning in an online forum or in a face-to-face environment discussions allow you to create and consolidate new meaningful knowledge.</p>
	<p>Self-check</p> <p>A self-check is an activity that allows you to assess your own learning progress. It is an opportunity to determine the levels of your learning and to identify areas for improvement.</p>
	<p>Readings (required and suggested)</p> <p>The required reading is referred to throughout this Student workbook. You will need the required text for readings and activities.</p> <p>The suggested reading is quoted in the Student workbook, however you do not need a copy of this text to complete the learning. The suggested reading provides supplementary information that may assist you in completing the unit.</p>
	<p>Video clip</p> <p>A video clip is something you will need to watch on your device. You will need to click on the link or copy and paste it in your device browser.</p>

Icons	Descriptions
	<p>Measure ingredient quantities to meet recipe, formula and production schedule specifications</p>
	<p>Check products to identify faults and rectify</p>
	<p>Maintain records</p>

Self-assessment

On a scale of 1-5, place a number in the ratings column to identify your current knowledge and skills for the following tasks. Likert scale 1-5:

[1 = beginner, 2 = practice needed, 3 = good, 4 = very good, 5 = exceptional]

How good are you at...	Your rating
Prepare a workspace before starting an activity to make sure it is safe and clean.	
Used a recipe to make something.	
Worked with baking equipment.	
Used personal protective equipment.	
Used measuring and weighing equipment.	
Operated a mixer to combine ingredients.	
Checked that a mixture is well mixed.	
Worked with dough and batters.	
Used an oven and set the temperature.	
Checked to see how your baking was going.	
Unloaded an oven and cooled your baked item.	
Prepared and stored baked items.	
Cleaned equipment and your work area when finished baking.	
Disposed of waste after cooking.	
Completed workplace records, such as a production schedule.	

Biscuit and cookie products overview

Today the terms ‘cookie’ and ‘biscuit’ are used to describe the same type of product — a chocolate cookie is also known as a chocolate biscuit.



Chocolate cookies by [Oleg Magni](#) under [Pexels licence](#)

It is a common assumption to collectively group these two confection lines under the loose heading of ‘biscuits’, but they are in fact quite different from each other. Today though, any small baked confection is termed a biscuit; even macarons are referred to as macaroon ‘biscuits’.

The term ‘biscuit’ means ‘twice baked’ or ‘twice done’. This means they are drier in character by comparison to ‘cookies’. ‘Cookie’ from the Dutch *koekje* means ‘cake’.

Australians have adopted the traditional English version for the distinction between biscuit and cookie. A biscuit is a small, stiff, sweet mixture of flour, liquid, fat and other ingredients. They are shaped and then baked.

Cookies on the other hand are usually a bit larger, softer (or chewier) and more moist than a biscuit.

Americans generally refer to both biscuits and cookies as cookies.

Popular biscuits include Biscotti, Viennese, Shortbread style, biscotti, Florentines and wafers. Some well-known commercially produced biscuits include: Sao (crackers), Arrowroot (semi sweet), Kingston and Monte Carlos (sandwiched shortbread style).

Another variety is the fat free (no egg yolk) sponge finger (Savoardi, also known as lady fingers) made only with eggs, sugar and flour. These are used as a delicious base for desserts as the dry sponge texture soaks up the distinctive flavours of Trifle (Sherry), Zabaglione (Marsala) and Tiramisu (Coffee).

Topic 1

Preparing for work



Topic 1: Preparing for work

This topic is about how you prepare yourself and your work area before you start bakery work.

You will learn about:

- regulatory requirements for producing biscuit and cookie products
- preparing the work area to meet food safety and workplace health and safety requirements
- protective equipment for working safely
- basic baking equipment and readiness for use
- production scheduling – techniques and considerations
- product processing requirements
- minimising waste in recipe formulation
- confirming the volume that you need to bake
- calculating yield
- adjusting recipes to meet required production volume
- selecting ingredients
- checking ingredients to confirm quality and quantity.

To learn about this topic:

- read the information
- complete any practice activities as instructed by your teacher
- complete the self-check questions
- talk to your teacher if you need some assistance with this
- take a look at the additional resources.

The baking industry

Ever wondered why we dip our Tim Tams in tea or coffee? Biscuits and cookies are a popular food and are produced in most bakeries. They can provide a nutritional, long-lasting and convenient snack food. Hard biscuits soften as they age, early bakers would bake the hardest biscuits possible. Correctly stored biscuits could last for years. To soften the biscuit they would be dipped in brine, coffee, tea or other liquids.

Regulatory requirements in the industry

Every food business in Australia is required by law to ensure that their food is safe to eat and that staff have been properly trained. Anyone that handles or prepares food, serves food, transports food or cleans food equipment and utensils, must undergo food safety training.

Take a look at these important requirements in the following documents:

- Australian Institute of Food Safety [Guide to Food Safety Laws and Regulations](#)
- NSW Department of Primary Industries [Food Authority Fact Sheet](#)

Preparing your work area to meet food safety and workplace health and safety requirements is a key step in your daily work preparation. Hygiene in your workplace is very important and there are significant consequences for workplaces who fail to meet food safety standards.

To stop the spread of bacteria, make sure that you:

- regularly clean and sanitise equipment and utensils
- wash your hands between tasks
- clean up spills on the floor immediately
- maintain high standards of personal hygiene
- store food items when not in use, in the correct area

The baking workplace must also follow the requirements of NSW Work Health and Safety Legislation as well as the [Australian New Zealand Food Standards Code – Standard 2.1.1 Cereal and cereal products](#).

Workplace health and safety (WHS)

Staying safe in the kitchen is crucial and is your responsibility, as well as your employers. Accidents harm employees, cost money, lead to time off work and increase insurance premiums. Some accidents permanently injure staff and as a result they cannot continue to work. The steps you need to take to ensure the safety of yourself and others are very important. You will learn about the safety requirements of working in a bakery throughout your course.



Practice activity

Activity 1.1: Working safely

Research equipment commonly used in a bakery. Use the space below to record your answer.

1. What are some common injuries caused by equipment?

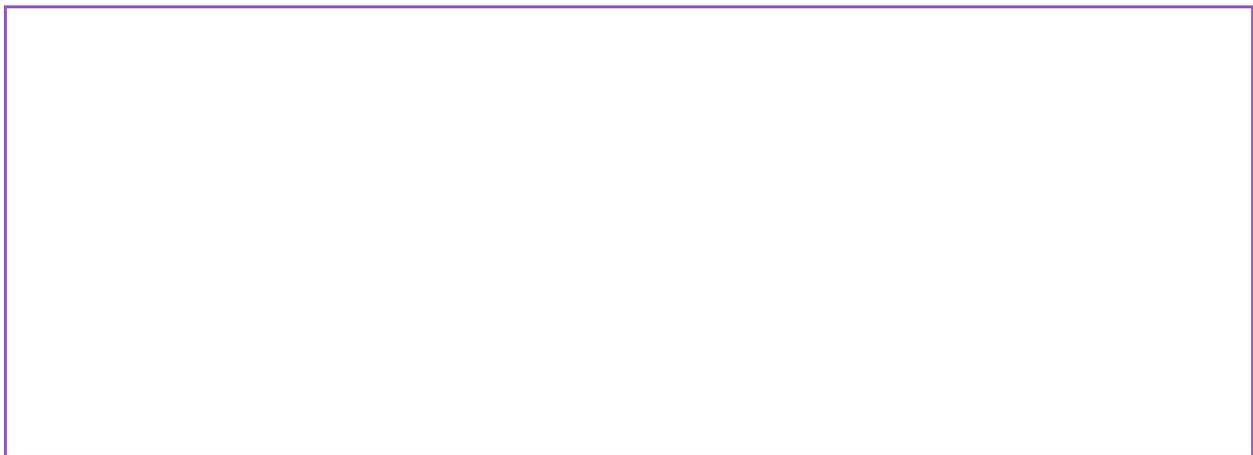
2. Which machines cause the most accidents?

The following are actions you can take in your workplace to ensure safety of yourself and others:

- Store equipment appropriately.
- Clean up any spills as you go – use a wet floor sign after mopping floors.
- Ensure you are using the correct chemical to clean surfaces and equipment.
- Handle knives correctly, and ensure they are washed correctly.
- Ensure you follow your workplace manual handling procedures.
- Ensure you handle hot equipment correctly to avoid burns.
- When cleaning make sure the switch is off and the appliance disconnected from the wall.
- Make sure that blades, etc. are removed from the equipment before cleaning.
- Never mix oil from the fryer with water.
- Make sure that all equipment is regularly maintained to ensure there are no gas leaks, and therefore no explosions.

Personal protective equipment (PPE)

It is very important that you know the appropriate personal protective equipment to use in your workplace. You must learn how to clean, maintain and store it correctly. PPE may include non-slip footwear, hair/beard net, chef's uniform and oven gloves. Correctly using PPE will help to protect you and ensure hygiene is of a high standard.





Maintain records

Production schedule

A production schedule is an important document that tells you what and how work is to be completed. During practical activities in your course, you will be expected to complete production schedules before you commence work and when you finish your work.

A production schedule will include the following:

- Product processing requirements - what needs to be produced and by when
- Recipe formulation to minimise waste
- Finishing parameters for basic bakery products – timings and temperatures
- Bake parameters for basic bakery products

At the end of your work, you record anything on the production schedule that may have happened differently than what you had planned. This could include the amount of bakery items produced differing from the expected yield, if there were any faults or discrepancies, and how you addressed these.

Example of a production schedule:

Task	Time	Notes	Baking requirements <i>(include oven temperatures and timer settings)</i>
1			
2			
3			
4			



Self-check questions

Activity 1.2: Safety and production schedule

Answer the following questions.

1. What safety equipment should be used at all times when handling hot tins and trays?

2. What is the purpose of a production schedule?

3. Describe at least three safety precautions you can take to avoid machinery accidents in a bakery?

4. Why is it important that all equipment is clean before use?



Collaboration

Activity 1.3: Personal protective equipment

Your teacher will discuss the purpose of wearing and/or using personal protective clothing and equipment, and what the consequences of not using it may be.

Always wear your full chef's uniform to class and work and ensure that it is clean and pressed. You will be expected to follow correct work health and safety and food safety guidelines throughout your time in the bakery.

Identify the purpose of the following personal protective equipment and uniform.

PPE	Purpose
Chefs uniform	
Hat/hairnet	
Footwear	
Gloves	
Apron	

Product spotlight: Anzac biscuits

Anzac biscuits are a classic Australian treat that are commercially available all year round; however, are associated with the Australian and New Zealand Army Corps, established in World War 1.

The main ingredients in the biscuits are rolled oats, flour, sugar, butter, golden syrup, bi-carbonate of soda, boiling water and coconut.

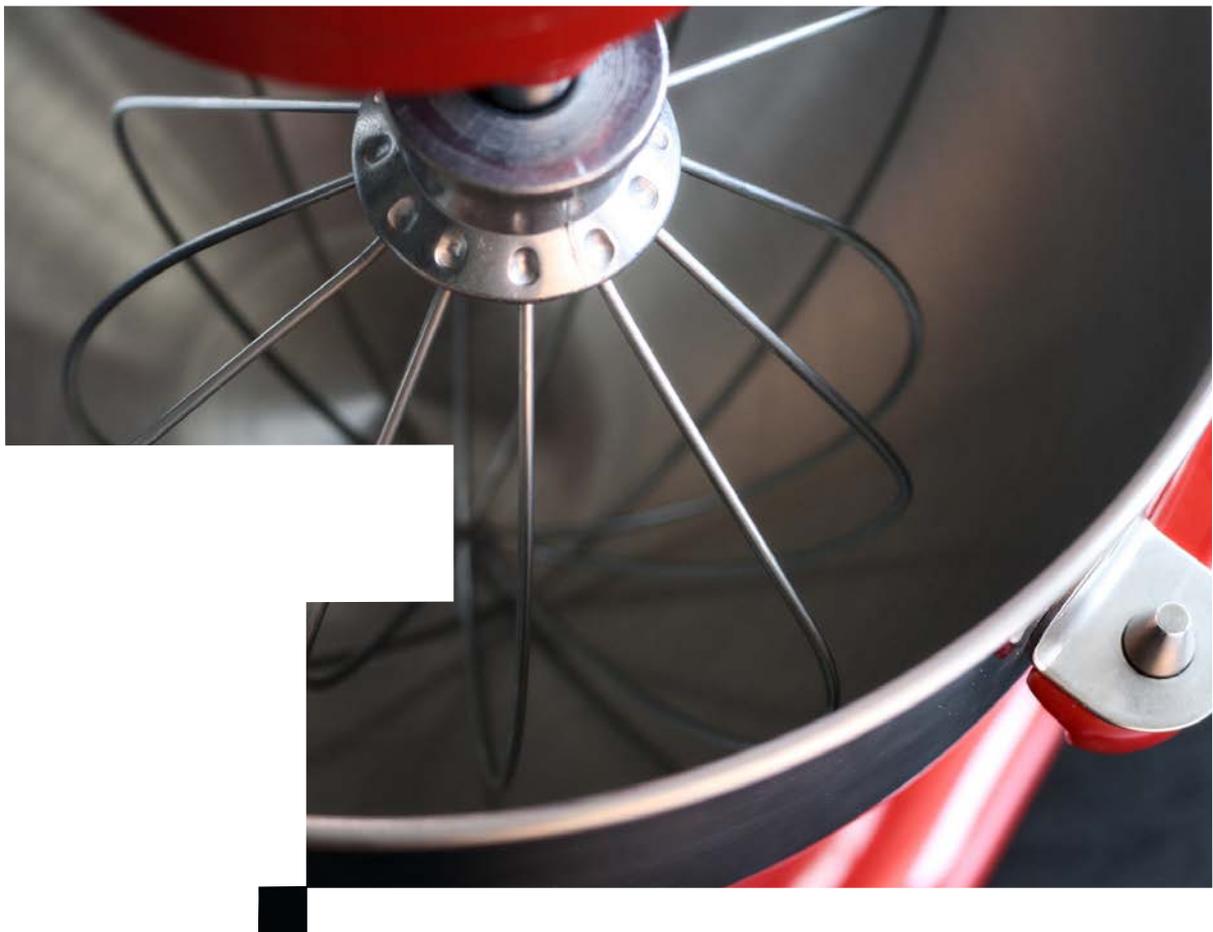
The term Anzac is protected under Australian law and cannot be used in Australia without permission from the [Minister for Veterans' Affairs](#); ^[2] misuse can be legally enforced particularly for commercial purposes. There is a general exemption granted for Anzac biscuits, as long as these biscuits remain basically true to the original recipe and are both referred to, and sold as, Anzac biscuits and never as [cookies](#).



Oatmeal cookies by [StarFlames](#) under [Pixabay licence](#)

Topic 2

Equipment



Topic 2: Equipment

In this topic you will learn about the equipment used in baking, including:

- basic equipment
- industrial mixer and attachments
- preparation of trays.

Basic equipment

A key task within your bakery is to understand the purpose of all the equipment you will use. Before you start operating equipment make sure that you have read the standard operating procedure (SOP) and participated in training to learn how to use the equipment safely.

It is important to follow workplace procedures for using, cleaning and maintenance of equipment, plus the reporting of equipment malfunctions. You will learn more about this in Topic 9.

Let's look at the different equipment used in the bakery:

Tools and utensils:

- Hand whisks
- Spoons
- Biscuit and pastry cutters
- Rolling pins
- Flour brushes
- Egg wash brushes
- Piping bags and nozzles
- Whisk attachments
- Beater attachments

Equipment and accessories:

- Industrial oven
- Industrial mixer and attachments
- Industrial cook tops
- Gas, or electric hot plates and attachments
- Dish washing sinks, sinks, taps and accessories

Ancillary equipment:

- Dry and refrigerated ingredients storage containers
- Industrial baking tins, lids and pots
- Baking trays and bowls
- Ingredient storage bins
- Wire racks
- Equipment used to melt chocolate

Industrial oven

The parts of the oven include:

Part	Explanation
Thermostat	<p>A thermostat is a device which controls the temperature of the oven by regulating the flow of energy (heat) into the baking chamber. The baker uses the thermostat by setting a dial or digital display which is marked with the graduations of temperature in either ° C or ° F.</p> <p>The oven chamber can be controlled by the top and bottom heat settings. The steam setting is not usually required for baking biscuits and cookies.</p>
Damper (Flue)	<p>A damper is a small vent in the side, back or top of the oven. It may be closed or opened by the use of a lever device or similar, and allows the baker to control the rate at which steam and heat escape the baking chamber.</p>

Part	Explanation
Oven thermometer	The thermometer shows the temperature within the baking chamber by the position of a needle on the graduated scale of the dial face. Some thermometers now have a digital display.
Baking chamber	The baking chamber is the cavity or area of the oven in which the goods are placed for baking.
Oven sole	The oven sole is the floor of the baking chamber.
Oven crown	The oven crown is the ceiling of the baking chamber.
Oven refractories	This term is used to describe all of the materials, whether insulating or reflecting, in the construction of the oven, such as the steel plating in the walls, the stone in the sole and insulating materials in the wall cavities.

Guidelines for using the oven

- Preheat the oven well in advance so that you bake with a solid heat.
- To avoid injuries, only one person at a time should attend the oven.
- If baking a small load (two trays in a four tray oven) you may need to reduce the baking temperature slightly.
- If products start to brown too quickly adjust top and bottom settings on the oven.
- When baking biscuits and cookies, keep the damper closed to retain moisture in the baking chamber.
- When baking biscuits and cookies keep the damper open to bake in a dry atmosphere and produce a crisp biscuit.
- If the products are baking unevenly you may need to turn the tray during baking.
- Space products evenly on the tray for uniform baking.
- Use double baking trays to reduce the amount of bottom heat to prevent products from browning too much on the bottom and turn down the bottom heating element if adjustment is needed.
- Never use wet or badly worn oven gloves/mitts to handle hot trays.
- Where possible, avoid having to walk too far with a hot tray. Position a rack beside the oven for hot trays.

Industrial mixer and attachments

The most commonly used mixer for producing biscuit and cookie batters is the planetary mixer using a whisk or beater.

All machines when in use pose a potential danger. Before using a mixer, you should:

- Be given complete instruction on its correct and safe operation.
- Be supervised while using the machine at all times.
- Full attention must be given to the correct and safe operation at all times. If in doubt, always ask your trainer to help you.
- All machines should be used according to the manufacturer's recommendations to avoid damage to the machine and injury to the operator.

General guidelines for safe use of mixers

- Keep hands clear of all moving parts.
- Use the appropriate mixing attachment for each type of mix.
- Do not remove or override any safety devices.
- Start all mixing on low gear before changing to a higher speed. Some machines require you to fully stop them before changing speeds. Failure to do so may result in damaging the machine gears.
- If the electrical wiring looks faulty do not use the machine. Isolate the machine, place an 'out of order' tag on the machine and report the danger to your trainer.
- Wait until the mixing attachment is stationary before moving the safety guard and placing your hand in the bowl to scrape down or check the mix.
- Make sure that all mixing attachments/bowls are correctly secured before starting the machine.
- Do not lean on the machine at any time.
- Do not stand on a wet surface when operating an electrical machine.
- Switch the machine off at the power point before attempting to clean it.
- Do not allow water near the electric motor or switches.
- After use, switch the machine to low gear.
- Use clean, dry hands to operate the machine.
- Only one person is to operate the machine at any one time.

- Do not wear loose clothing when operating the machine.
- Do not use the safety guard to stop the machine, only use the off switch.
- Remove the mixing attachment before placing your hand/s in the bowl for scraping down or similar.
- If you are not sure how to use the mixer ask your trainer for assistance.
- Use the mixer according to manufacturer's recommendations.

Preparation of trays for biscuits

Trays are normally prepared by spraying, papering or lining with silicone mats or paper.

Cut it to a size that ensures minimal wastage of paper and makes trimming after baking unnecessary. Single thickness of paper is normally sufficient for biscuits and cookies.

The reasons for papering the trays are:

- The paper helps to insulate the biscuits during baking.
- The biscuits are more easily removed from the tray.
- The paper helps to maintain and protect the shape of the biscuits.
- The paper helps to retain moisture in the biscuits during and after baking.
- Improved hygiene – biscuits can be handled without direct human contact.



Practice activity

Activity 2.1: Equipment

Use the box below to answer the following activities.

1. Observe your work colleagues in the workplace. Is there adequate supervision for performing particular tasks with dangerous equipment? If so, what tasks and machinery?

2. Talk to your work colleagues about the potential dangers associated with using equipment in a bakery and document their responses. Do they understand the dangers? What advice would they suggest to ensure you keep yourself alert and safe? Where are the machinery instructions located in the workplace?



Self-check questions

Activity 2.2: Using the oven

Read the question carefully. Your answer should be a minimum of **25** words but no longer than **100** words.

1. Describe two methods of tray preparation for cookies and possible effects of incorrect tray preparation.

2. How can you avoid overcooking the base of cookies?

3. What is the damper on an oven? And what does it control?



Collaboration

Activity 2.3: Using bakery equipment

Your teacher will demonstrate how to use particular bakery equipment. Observe your teacher, when it is time for the practice activity, gain permission to practise using the bakery equipment.

Scales

TARE, 1 gram increments, 5 gram increments

Check your scales are:

- clean
- on a level bench
- they turn on
- check increments.

Are they in 1 or 5 gram level increments?

Planetary mixer

Check your mixer is:

- Correct mixing bowl for the size of the mixer
- The correct attachment
- Clean
- Plugged-in, power on
- Safety guard is in working order

Practice putting the bowl in correctly, the safety guard shuts and the safety latch is on. Your teacher will observe you practising the safe use of the mixer.

Deck oven

Your teacher will give you an introduction to the deck oven, including:

- Top and bottom heat
- Timer
- Steam setting
- Opening and closing oven door
- Loading and unloading
- Using oven mitts correctly
- Correct handling of trays

Your teacher will demonstrate oven safety and ask you to practice loading and unloading trays to reinforce the importance of this work health and safety procedure in order to minimise the risk of burns to yourself and others.



Hot muffins by [Taylor Grote](#) under [Unsplash licence](#)

Product spotlight: Shortbread

Ingredient handling/warehousing

Shortbread is a traditional Scottish type of cookie/biscuit with a high butter content. It is generally made from three ingredients (flour, butter and sugar). In 1921 the British government declared that, in order to be called shortbread, a product must get at least 51% of its fat from real butter. Cookies marketed as shortbread outside Britain; however, do not have such a requirement. Typically unsalted or sweet butter is recommended in shortbread recipes so as not to affect the taste of the cookie.

Mixing and forming

There are a variety of factors that are important when it comes to mixing the dough including the temperature of the ingredients, the mixing time and the order in which ingredients are added. Shortbread dough requires that the butter be at room temperature for proper mixing. Over mixing shortbread dough causes it to become tough and oily. The sugar and butter are mixed first, with the flour being folded in later.

Once the dough is mixed, it must be formed into individual cookies. Shortbread comes in a variety of shapes, but it is typically moulded by a rotary moulding machine. The thickness of the dough is crucial. If it is too thick it will be too doughy. On the other hand, if it is too thin it may be too crispy or even burn. The moulding machine ensures a uniform shape for baking.

Baking and cooling

Once the dough is properly mixed and formed, it must be baked. Ovens in commercial bakeries are 300ft (91m) long tunnels with adjustable speed conveyor belts and extremely sensitive temperature controls. Many chemical and physical changes take place during baking so it is important that the process is closely monitored. Each 18-30ft (5.5-9.1 m) section of the oven has its own temperature controls and doors that allow employees to observe the cookies and vent the oven if necessary.

After the shortbread is baked, it must be cooled on a cooling conveyor. Controlled cooling helps the shortbread to retain appearance, taste and texture. Controlled cooling also prevents condensation when the shortbread is packaged.

Packaging

The last step in the manufacturing process is packaging. As one of shortbread's desired properties is crispness, it is important that the manufacturer package shortbread in a rigid and airtight container to prevent the cookies from breaking or getting soggy from moisture. Often manufacturers choose a tin box or canister to hold the shortbread. Other manufacturers house the shortbread in plastic trays surrounded by some type of outer paper packaging. The outer package, whether it is tin or paper, is decorated to make it appealing to the consumer. Oftentimes shortbread manufacturers choose a traditional Scottish plaid design for their packages. Individual shortbread packages are then put into case boxes that are stacked on pallets for shipment to stores. All individual boxes and cases are coded so that they can be traced back to the time and place of manufacture.

Piped shortbread are produced by putting the dough into a piping bag fitted with a star tube and then squeezing the bag. For further viewing, watch this YouTube video (<https://www.youtube.com/watch?v=cRxt8GC3wB8>) on piping cookies:



Topic 3

Ingredients in biscuit and cookie production



Topic 3: Ingredients

In this topic you will learn about the ingredients used to make biscuits, and an overview of the different types of biscuits produced by mixing methods and by production method.

You will learn:

- The basic ingredients used to make biscuits and cookies
- Flavouring ingredients
- Pre-condition ingredients
- Biscuit and cookie type based on doughs
- Biscuit and cookie types based on production methods

Basic ingredients

See below the basic ingredients used in cookies and their functions.

Flour

Flour is the principle structure builder in most cookie formulas. It provides the framework around which the other ingredients are grouped in varying proportions. Flour is a toughening agent as when it comes in contact with the liquids in the formula, the gluten forming proteins form the main structure of the cookies. A range of flours can be used to make hard and soft cookies. Flour with a higher percentage of gluten forming protein (Hi Protein and Bakers) may cause some types of cookies to lack spread, while softer flours with a lower percentage of gluten forming protein (Hi Ratio, Sponge, Cake) may cause some cookies to spread too much.

It is best to use the type of flour specified in the recipe.

Sugar

Sugar in some form is used in all cookie recipes. It is an important tenderising ingredient. Undissolved sugar crystals melt during baking which contributes to the flow or spread of the cookies. The finer the granulation, the less the cookie will spread; the larger the granulation, the more the cookie will spread. Powdered sugar is used when a close texture when little spread during baking is required.

When brown sugar is used in place of white sugar a small amount of bicarbonate-soda should be used to neutralise the acid in brown sugar. This neutralisation of the acid will improve the crust colour because acids interfere with the caramelisation of sugar. As all

brown sugar crystals dissolve during mixing, proper spread will not be achieved without formula adjustments.

If molasses is used the addition of bi carbonate of soda is necessary to compensate for the acidity. The liquid content will also need to be adjusted.

The addition of honey will give the cookie a chewy quality.

Fats and shortening

Fats and shortening promote tenderness in the cookie. They also prevent over-development of the gluten in mixing. Without shortening cookies would be tough and rubbery. This would result in cookies becoming dry and lacking in eating quality. Shortening also contributes to the spread of the cookies. Most hydrogenated shortenings have a bland flavour; butter and margarine will produce cookies with a more desirable taste and flavour.

Eggs

Eggs are both tenderisers and tougheners in cookie baking. Egg yolks contain a very large percentage of fat which helps to tenderise the cookie. On the other hand, the egg whites acts as structure builders because of the proteins which coagulate during baking. Eggs also contribute moisture. Whole eggs contribute to the combined characteristics of shortness, aeration, tenderness, crumb colour and binding of dry ingredients.

Liquids

Liquid in some form is necessary in all cookie recipes. Water is necessary to moisten the flour proteins to form gluten, so the structure can be created. Water also contributes to dough consistency and helps to control the temperature of the dough or batter. It also dissolves the chemicals in baking powder so that carbon dioxide can be produced to leaven the cookie and to assist in the spread of the cookie during baking.

Milk solids

Dry milk solids tend to exert a slight binding action on the doughs. Milk solids are a valuable addition to cookie recipes because they provide added nutritional value. The milk sugar lactose adds to the richness of the crust colour.

Chemical aerators

Chemical aerators help to control spread or size, produce volume and promote proper crust colour through regulation of acidity or alkalinity (pH) of the dough.

Cookies that are hand deposited, piped with a pastry tube or machine deposited, need the spread control of leavening agents. An alkali, such as bi carbonate of soda, exerts a weakening effect on the flour proteins (gluten) and helps to promote spreading. Since most cookie ingredients are neutral to slightly acid, they are usually sufficient to neutralise any reasonable quantity of bi carbonate of soda.

Bi carbonate of soda (also known as Baking soda)

Bicarbonate of soda, an alkali salt, can be added alone or as a component of baking powder. The alkalinity of bi carbonate of soda lowers the caramelisation point of sugar in the cookie dough or batter, causing faster and darker colouring of the crust. Soda also has a weakening effect on flour proteins. This action is more pronounced when soda is used without the counteracting food acid contained in baking powder.

Baking powder

Baking powder needs heat and moisture to react.

Baking powder is a mixed blend of food acids (of which there are several types) and bicarbonate of soda with starch added to prevent the baking powder from lumping during storage. During the baking process the acid ingredients reacts with the bi carbonate of soda contained in the baking powder, forming carbon dioxide gas. None of the acids nor the soda remain in the finished product, because they neutralize each other.

Flavouring ingredients

Salt

Salt is used for its own flavour and to bring out the natural flavours of the other ingredients. The amount of salt must be reduced slightly when salted butter is used as the shortening ingredient in the recipe.

Cocoa

The use of cocoa requires an adjustment to the formula. Sugar is added to counteract the tendency of cocoa to toughen the dough and in order to sweeten and enhance the cocoa flavour. A slight adjustment in liquid and/or flour may be necessary also.

Additional flavours

There are a limitless selection and combinations of additional flavours to enhance the taste and make the product visually appealing. They are added as required by the recipe.

These are just a few of the popular enhancements:

Additional flavours	Product
Seeds: sunflower, pumpkin	Muesli cookie
Nuts: pecan, walnut, hazelnut pistachio, almond, peanut	Walnut chocolate cookies, pistachio biscuit, almond macaroon, almond crescent
Fruit: glace fruit, dried, cranberries, sultanas	Pineapple macaroon, coconut macaroon, white chocolate and cranberry cookie
Spices	Gingerbread
Chocolate	Triple choc cookie
Oatmeal, rolled oats, oatbran	Anzac biscuit

Biscuits are commonly garnished to improve their visual appeal. Bakers are coming up with more creative and fun ideas all the time. These include cotton candy, spun sugar, chocolate ganache, piped chocolate or caramel, and ruby chocolate pieces.

Preconditioning the ingredients

Preconditioning the ingredients means making sure that the ingredients are in a condition that will produce the best results.

For example:

- Warm the eggs
- Soften the butter (fat)
- Warm the sugar

How to precondition ingredients:

- Measure the eggs into a bowl and warm over a pot of warm water. Mix the eggs with a whisk to emulsify.
- Weigh the sugar into a bowl and place the bowl in a warm oven only long enough to warm the sugar.
- To soften butter, chop into small cubes until it comes to room temperature. You can warm in the oven but be careful not to melt it.
- Whilst the batter is being mixed place a bowl of warm water under the mixing bowl, long enough to warm the mix.

Note: Be careful not to overheat the butter (fat), as it will melt to oil, which will not mechanically aerate. Be careful not to overheat the eggs, as they will start to cook (coagulate) at approximately 60° C.

Product types: Biscuits and cookies

Biscuits can be classified in different ways. Some are classified by their fat or sugar content, or by the forming method. Another classification is the state of batter or dough being liquid, soft or hard dough. Some classify the biscuits by group names such as cookies, soft biscuits, hard biscuits and crackers.

Types of biscuit batter and cookie based on dough types

Dough types	Biscuit/cookie batter
Hard doughs (such as crackers or lavosh)	Usually savoury, unsweetened or semisweet biscuits. All types of crackers are made from hard doughs. In addition to having a low sugar content, or none at all, the fat content rarely exceeds 22% of the flour content.

Dough types	Biscuit/cookie batter
Biscuits and cookies made from soft doughs	<p>The soft dough group includes all the sweet biscuits, whether they are plain biscuits, shells, or flow type such as ginger nuts. Soft dough biscuits have many factors in common.</p> <p>Soft doughs are typically rich in fat (65-76% of flour weight) and sugar (35-40%). Flour with a lower percentage of gluten forming proteins is used and mixing methods may vary, so refer to the recipe. Often more expensive ingredients are used in soft doughs such as almonds, coconut flour or cocoa.</p>
Biscuits or cookies made from short doughs	<p>The vast majority of worldwide consumed biscuits and cookies are made from short doughs and are produced through mass production processes and formulas. The range of size, shapes, flavours and ingredients is huge, but some consistent requirements exist. A range of flours are used and the proportions of fat and sugar can range up to 100 and 200% of flour weight. The two main production processes for forming short dough biscuits are rotary moulding and wire cutting.</p>

Types of biscuits by production method

Biscuits and cookies are produced in three steps consisting of mixing, forming and baking. Biscuits vary based on the ingredients (makeup method), batter forming method (mixing method), method of processing and differences in baking techniques. The variations in the forming (production) process are often the most substantial.

The most common processing methods include:

- Moulded and portioned
- Deposited (also known as Piped and dropped)
- Cut and portioned

These processes will be discussed further in the forming the dough stage.

It is important your biscuits and cookies are all the same size and thickness. Baking times need to be uniform and are generally short timeframes, so small biscuits will burn before large ones are finished if cookie size is inconsistent.

There are a range process methods when producing biscuits and cookies. Some common terms include:

Moulded and Rotary moulding

- Wire cutting
- Depositing frozen cookie dough
- Bar
- Sheet
- Stencil
- Piped
- Rolled biscuits
- Sheeting and cutting (used for making crackers)

There are further processing methods are outside the scope of this unit.

Allergies

The most common triggers of food allergic reactions in childhood are peanuts, tree nuts, milk and egg. Common triggers of food allergy in adults are fish, shellfish, peanut and tree nuts. Insect sting and bite allergies, such as tick, are more common in adulthood.

Australia has a relatively high prevalence of **peanut allergy**. Almost 3 in every 100 children have a peanut allergy.

Around 20 percent of children grow out of their peanut allergy. Those children who have had more severe allergic reactions including breathing problems are much less likely to outgrow their peanut allergy than children who have experienced milder reactions. Sometimes, peanut allergies to not appear until later in life.

Egg allergy is one of the most common food allergies in childhood, affecting about 8 percent of infants aged 12 months. 80 percent of these infants are likely to outgrow their egg allergy within the first few years of life. Most children, even those who have had severe reactions, do eventually outgrow their egg allergy although some may not outgrow it until their teen years. A very small number of adults have egg allergy for life.

Milk allergy is one of the most common food allergies in childhood, affecting about 1-2 percent of preschool children. Fortunately, most children will grow out of their milk allergy. Current anecdotal observation suggests that whilst, in the past, most children would outgrow their milk allergy before starting school, increasing numbers are now outgrowing their milk allergy much later. Some children enter high school years with milk allergy and outgrow it in their teen years and a small number do not outgrow it. This small group remain milk allergic into adulthood.

Milk or milk products may be found in foods we don't always expect them to be in. It is important to use common sense and read food labels carefully.

This information has been taken from the [Allergy & Anaphylaxis Australia website](https://allergyfacts.org.au/allergy-anaphylaxis/food-allergens). (<https://allergyfacts.org.au/allergy-anaphylaxis/food-allergens>). Students are encouraged to research the website and refer to the Allergen Cards.



Practice activity

Activity 3.1: Anzac biscuit

1. Research the humble Anzac biscuit. What are the common ingredients used? Briefly summarise the history of the biscuits. Answer your research activity below.

2. Research conversion rates and using the table below, calculate the conversion rate for the following ingredients using the metric system (grams). The first example has been completed for you.

Ingredient	1 cup	1/3 cup	1/4 cup
<i>Butter</i>	<i>227 grams</i>	<i>76 grams</i>	<i>57 grams</i>
Cheese shredded			
Choc bits			
Hi ratio flour			
Caster sugar			
Icing sugar			
Sultanas			
Desiccated coconut			



Self-check questions

Activity 3.2: Ingredients

Read the questions carefully. Your answer should be a minimum of **25** words but no longer than **100** words.

1. Which grade of flour is most suitable for making the majority of cookies?

2. Name three types of liquid sugars used in cookie batters.

3. What are four functions of sugar in cookie batters?

4. When producing hot rolled biscuits what ingredient cause the biscuits to remain pliable?

5. Give two examples of fats that can be used to make a vegan cookie.

6. Name four ingredients used in a recipe to increase the fibre content.

7. What is a saturated fat?

8. What is an unsaturated fat?

Product spotlight: Macaron or Macaroons

Macaroon and macarons are terms that are often (incorrectly) used interchangeably.

They are in fact, two very different products.

Macaroons

Macaroons are moist, chewy and contain either ground almonds or coconut using a mixing method to combine the few ingredients. They are quite a rustic, unstructured biscuit, and can be decorated with melted chocolate, glace fruit, or jam.



Macaroons by Unknown under [CC BY-SA 2.0](#)



Macarons by [Vladimir Proskurovskiy](#) under [Unsplash licence](#)

Macarons

Macarons (often called French Macarons) are a meringue based confection. They should be dry and crisp on the outside, and softly chewy on the inside. They are comprised mainly of egg albumen, sugar and ground almond. Macarons may be piped in a range of styles and enhanced with a variety of decorations.

Ingredients can include: egg white, sugar, ground almonds, water, milk, and starch.

Methods for production of macaroon and macaron goods are described below:

Method	Production
Cold whisked	<ul style="list-style-type: none"> • Production of crisp biscuit macaroons • Coconut is carefully folded through by hand. If folding is too vigorous the foam will collapse.
Creamed paste	<ul style="list-style-type: none"> • Used only when almond paste is contained in a formula. • Used for small varieties or as fillings in tartlets.

Method	Production
Hot sugar	<ul style="list-style-type: none"> • Suits biscuit type macaroons. • A distinct crisp and brittle quality. • Ensure a clear distribution of coconut through the mix.
Boiled syrup	<ul style="list-style-type: none"> • Crisp type macaron. • Usually piped. • If foam is over whisked a brittle product will result and are prone to breaking. • Under whisked foam will result in a less stiff or slightly “sloppy” mixture, causing the macaron to become misshapen when cooking.
Warmed method, partial dissolved sugar	<ul style="list-style-type: none"> • Produces a soft quality slightly chewy macaroon. • Use a double boiler over hot water or a sauce pan over low heat constantly stirring until the correct temperature is reached. • Frequent mixing is required to achieve a uniform amalgamation. • Correct temperature must be achieved to ensure correct degree of sugar dissolving.
Cold blend method	<ul style="list-style-type: none"> • Is generally an all in method on low machine speed. • Used for sheeting type macaroon. • Whole egg and milk are common ingredients in this type of macaroon. • Milk replaces water in this method.

Topic 4

Mixing methods



Topic 4: Mixing methods

In this topic you will learn about the different methods to mix the ingredients and the effect it has on the biscuit dough.

You will learn about:

- Mixing methods
- Sifting tips
- Scraping down the bowl

Mixing the dough and batter

Biscuits come in many shapes and forms. The right ingredients mixed perfectly are essential in setting the scene to produce a high end product.

There are primarily four stages of making biscuits and cookies:

1. Mixing
2. Forming
3. Baking
4. Cooling

In the mixing stage, flour, fat, sugar, water and other ingredients are mixed together in the right proportion using a particular method to form the dough. The mixing time is carefully managed to achieve uniform distribution of ingredients and the right dough consistency.

Many cookie problems are related to incorrect dough mixing. Some cookie recipes require the creaming of the eggs, shortening and sugar prior to adding the flour, other methods call for all the ingredients to be thrown in together.

There are many techniques used to create baked goods, and with so many different terms, it can become confusing. The following chapter will explain the different types of mixing methods and the common names.

The mixing methods for biscuits and cookies are very similar to cakes. The main difference is less liquid is added to the mixture, so missing is somewhat easier. Less liquid means gluten is less developed by the mixing. It also makes it easier to achieve a smooth, uniform mix.

Mixing methods:

- Whisking methods (warm and hot sugar methods)

- Creaming method
- Melted method
- Rubbing in method
- All in one is also known as the one stage method



Sieving brownies by [Nordwood Themes](#) under [Unsplash licence](#)

Mixing tip: Sieving

Passing dry ingredients, such as flour, cocoa powder, baking powder or spices, through a sieve achieves four things:

1. Combines ingredients
2. Aerates ingredients
3. Removes lumps
4. Reveals contaminants such as weevils

Whisking method

Also known as the whipping method, the whisking method requires the wet mixture, usually egg whites and sugar, to be whisked in order to achieve aeration. The sieved dry ingredients are gently folded through the aerated egg mixture in batches. The aerated wet mixture is processed to the ribbon stage before any further ingredients are added.

To prevent a crumbly, dense biscuit, make sure you fold the batter in until there are no traces of flour. Don't overmix as a light and airy texture is the desired result.

There is little or no raising agent in this batter, so the whisking method will help to give you a light eating biscuit. Airy cookies or crisp, delicate biscuits, such as tuiles, fortune cookies and pineapple coconut macaroons, are made by the whisking method.



Egg white snow by [stux](#) under [Pixabay licence](#)

Creaming method

Also known as the sugar batter method, the creaming method is a commonly used method of processing cookie dough, used when making Viennese biscuits. The method allows for balance between a tender and tough–yielding biscuit that can be piped, rolled and cut into different shapes using specialised cookie cutters while still maintaining quality crumb.

Ingredients should be preconditioned before mixing and a planetary mixer with a beater attachment should be utilised.

The sugar and fat are blended together first and then creamed (beaten) until light and creamy. Creaming encourages small air cells to form and incorporate into the mix.

On medium speed, cream the butter until light and fluffy depending on the required finished dough consistency. Reduce to low speed and add the beaten warmed eggs, mixing well between each addition — this will help prevent separation or curdling. Mix in the sieved dry ingredients until the batter is clear or it leaves the side of the bowl cleanly. At the end of the mix, you might need to fold in additional ingredients by hand such as chocolate chips, toasted nuts or cranberries.



Sugar batter method by [CongerDesign](#) under [Pixabay licence](#)



Melted butter by [Brite](#) under [Pixabay licence](#)

Melted method

The melting method refers to ingredients that have been carefully measured, such as sugars and fats that are melted together in a saucepan. Once melted or dissolved they are then mixed with dry ingredients, such as flours and oats, to make batter. Anzac biscuits and white chocolate and cranberry cookies are both processed using the melted method.

You can use a microwave or a stovetop to melt your ingredients. Make sure the flame is small and directly underneath the saucepan the pan to avoid burning the ingredients. For microwaving, no more than 20 seconds at a time, on medium wattage is a general rule to follow.

As there is no beating or whisking in this method, a chemical raising agent such as bi-carbonate of soda is used to achieve the required aeration.

Do not over mix the mixture as you will overdevelop the gluten and the biscuit will end up dry and tough.

The rub in method

The rub in method requires a bit of skill and a light touch. It is generally made in batches by using the planetary mixer with the beater attachment; however, for smaller batches it can be mixed by hand.

The method involves rubbing and distributing fat evenly into a flour mixture until it resembles bread crumbs. The process works by working the fat into the flour by a method of rubbing the pieces through your fingers. When rubbing in by hand the fat should be rubbed in quickly to create a crumbly texture and avoid turning into a paste or melting.

If mixing by hand, take the butter and flour from the bowl using your fingertips and lightly rub them together and sprinkle the ingredients back into the bowl.

Sugar is usually added, and then a little liquid to create a dough. The trick with any rub in method is as soon as your liquid is evenly combined, stop working it. Simply form it into a shape that works for your recipe or very gently and carefully roll it out and then stop handling it.



Rub in method by [dimitrivetsikas1969](#) under [Pixabay licence](#)

All in one method (one stage)

This method is when you add all the ingredients into one bowl and mix them together. Cookie doughs have less liquid than cake batters, so even mixing is easier. This method is not frequently used as the baker has less control with this method. It may be used for chewy biscuits when overmixing is not a concern.

Method: Ensure accurate measurement of ingredients and ensure they have been pre-conditioned. Place all ingredients in a planetary mixer with the beater attachment. Mix at low speed until all ingredients are uniformly blended. Scrape down the bowl when required.



Electric mixer by [stux](#) under [Pixabay licence](#)

Scraping down the mixing bowl

The main reason for scraping down the mixing bowl is to make sure that all ingredients are evenly mixed (no lumps of fat etc. through the mix), to produce the best result possible.

You should scrape the mixing bowl as often as necessary using the correct scraper for the shape of the bowl. You may need to turn your machine off, remove the attachment and scrape where the beater does not reach the base of the bowl.

For an all-in mix it normally only requires to be scraped down after the initial blending of ingredients. For other methods of mixing, where ingredients are added in various stages, it is necessary to scrape down during each stage and again after all ingredients have been added.

After depositing the batter onto trays it is also necessary to scrape the mixing bowl to remove all batter—to avoid wastage of ingredients, provide maximum yield and make the job of washing the mixing bowl much easier and quicker. Remember, all of these are necessary to make your bakery more cost-efficient.



Practice activity

Activity 4.1: Mixing methods

1. What is the best mixing method for the following products?

Biscuit type	Best mixing method
Macaroons	
Anzac biscuit	
Viennese biscuit	
Shortbread	
Walnut cookies	
Brandy snaps	

2. Explain the fault result and the corrective action required for the variations to dough and batters.

Variations	Will result in what fault	Corrective action
Low volume		
Egg too cold		
Mixture too soft		
Mixture too stiff		
Fat too soft		
Fat too cold		

3. Discuss pre-conditioning ingredients before mixing.

Ingredient	Preconditioning (warming) method
Eggs	
Fat/Butter	
Milk	
Flour/Sugar	



Self-check questions

Activity 4.2: Explaining mixing methods

1. Describe the characteristics of a cookie that is made from an overmixed dough.

2. What is the difference between a Macaron and a Macaroon?

3. Name three advantages of freezing cookie batters.

4. List two ways you could alter the recipe to enhance the visual appeal and flavour.

5. Explain the following methods:

Method	Method characteristics
Rub in method	
Whisking method	
Melted method	
Creamed method	
All in one method	

Topic 5

Forming and processing methods



Topic 5: Forming and processing methods

This topic discusses the biscuit and cookie processes. It includes the three stages of forming the dough, the production of shaping the biscuit, and baking to produce the desired type of biscuit and cookie product.

You will learn about:

- Forming the dough - production methods
- Moulded and portioned
- Deposited (drop)
- Piped
- Cut and portioned (rolled)
- Adding fillings to dough
- Nuts
- Fruits

Forming the dough and batter

Just like the type of ingredients and the mixing method, the form of the dough/batter is another way of distinguishing biscuits. There are a variety of techniques to ensure perfect drop, shaped, icebox and rolled cookies.

Moulded and portioned biscuit

The first stage of the moulded method is to accurately divide your cookie dough into equal portions. Until you become skilled in estimating, you should rely on your scales to get the measurements correct.

Each divided piece is moulded into the desired shape. This can be done by hand or by using a specialist cookie mould.

If the dough is too soft to handle, refrigerate the dough at each stage.

Place the pieces of dough onto prepared baking trays, leaving 5cm space between each (depending on your required spread – refer to the recipe). Some cookies may be rolled in sugar or other ingredients can be added, such as nuts, chocolate and dried glace fruits.

For a more rustic look you can press your dough with a fork to give shape and visual appeal.

Deposited (drop)

Cookie doughs are soft or pourable batter. They contain minimal water and are deposited as clumps during baking. Control of cookie spread is crucial for correct sizing in production and packaging. Depositing machines are utilised for commercial bakeries.

A deposited biscuit has more liquid added to the dough (often milk). As the dough is more moist it cannot be kneaded or rolled, instead, the batter is dropped onto the baking tray. Drop biscuits have a coarse appearance and texture and do not rise as much as other biscuits. They are relatively brittle.

There are different techniques for depositing; you can use a piping bag, ice cream scoop, a spoon or simple hand depositing.

A variation to the deposited biscuit, is the piped biscuit.

A piped biscuit uses a method in which the dough is shaped and deposited with a piping bag. Piped biscuits are made from soft doughs. You want to be able to pipe the dough through a piping bag, yet stiff enough to hold its shape.

Method: Fit a piping bag with a tube of the desired size and shape. Fill the bag with the dough. Pipe out the dough on to a prepared tray to make the desired shape and size biscuits.

Cut and portioned (rolled biscuit)

A rolled biscuit is made from dough rolled and cut into required shapes. There are always scraps left over after cutting and each time the scraps are rerolled, the dough toughens. Excessive rolling or too much flour when dusting will result in damage to the final product.

Method: Chill dough thoroughly, roll out dough evenly on a dusted work surface. Use as little flour as possible for dusting, as this flour can toughen the biscuits. If the dough is especially delicate, roll out between sheets of silicone paper. Cut out the cookies with cookie cutters, cutting as close as possible to reduce the quantity of scraps. Place cookies on prepared trays. A prebake glaze such as egg wash can be applied.

After baking, cut-out cookies can be decorated with royal icing, water icing, soft fondant, plastic icing and flex frost. Cool the cookies completely before decorating.

Using ingredients in your dough

Fruits and nuts are commonly added to biscuits and cookies to enhance flavours, increase nutrition, alter textures and for visual appeal. We don't just want them to taste good, we want them to look good too.

Any decoration (such as nut pieces or choc chips) should be done as soon as possible after the cookie has been deposited on the tray; this ensures adhesion and reduces damage in handling.

Inclusion of nuts for biscuit production

Nuts can be used to produce particular flavours and textures and can be added using as a variety of techniques. Roasting nuts will enhance the flavour and aroma. They are added as required by the recipe and may include:

A whole nut can be pressed into the top of each individual biscuit.

They can be used to indicate the type of biscuit or used for decorative purposes. For example, you might want to press a whole almond into an almond flavoured biscuit or a hazelnut into a hazelnut biscuit.

Chopped and flaked nuts can be sprinkled over biscuits in the same way as sugar. Nuts brown during baking, so avoid using on biscuits that are baked at a high temperature or on biscuits that are baked for a long time as the nuts may overcook.

Types of nuts

Most nuts can be added to batters to create different variations to products. Some of the most common nuts include:

- **Macadamia nuts:** These rich, sweet, tropical nuts native to Australia have a creamy flavour and velvety crunch. Macadamia nuts are most often used roasted and chopped in cookies.
- **Almonds:** Oval-shape almonds have a mild, rich flavour and are available in a variety of forms; whole, slivered and ground. They can be purchased natural with the skin on or blanched with the skin off. Almonds are also used in the production of almond paste and marzipan, two important products used in professional baking.
- **Hazelnuts:** Also known as filberts and cobnuts are grown throughout Europe. The distinctive flavour is greatly improved by toasting, which is also the easiest way to remove most of the hazelnut skin. They are also used to make hazelnut paste, an important flavouring agent.

- **Peanuts:** Despite being a legume, they are the most common nut. Peanuts can be roasted or salted to bring out its buttery flavour. When your cookie recipe calls for peanuts, use cocktail or dry-roasted peanuts. Peanut butter can also be used as an alternative.
- **Walnuts:** Available in either shelled or unshelled products, they are generally available all year round.
- **Pecans:** Pecans have the highest fat content of any nut. They can be used toasted, roasted, salted, chopped, whole, or broken into pieces.
- **Pistachio nuts:** Pistachio nuts have a mild, sweet flavour. They need to be shelled before use. They're available all year long: shelled or unshelled, raw or roasted, and salted or unsalted.

Sometimes nuts can be substituted for one another. Use your own judgment based on what flavours people like and which nuts have similar textures. Here are some alternatives to experiment with:

- Almonds and pistachios
- Almonds and hazelnuts
- Pecans and walnuts
- Peanuts, macadamia nuts, and cashews

Chopping nuts

Nuts can be chopped using a food processor or hand chopping. When hand chopping, use a large chef's knife with a tapered blade, and an appropriate chopping board. Remember to include a damp cloth under the board to prevent movement.

With one hand on the handle and the other on the tip of the knife, carefully rock the knife blade across the nuts until they are the right size. Go slowly so the pieces don't fly off the cutting board.

There are common terms referring to chopping nuts, some of the interpretations are listed:

- Coarsely chopped nuts are cut into irregular pieces approximately ½ cm or larger.
- Chopped nuts are cut into irregular pieces approximately ½ cm big.
- Finely chopped nuts are cut into irregular pieces approximately 3 mm big.
- Ground nuts are usually prepared in a blender or food processor, to resemble coarse flour.
- As part of your mise en place, chop the nuts and then re-weigh to ensure the ingredient measurement is accurate.

Nut storage

To keep your nuts fresh, store them in their shells until you are ready to bake with them. Nuts are high in fat content so they spoil easily. The higher the fat content, the faster they will spoil. Always store the nuts in a sealed, airtight containers or bags.

- Shelled nuts can be stored in a dry, cool location (such as a pantry) for up to three months.
- Shelled or unshelled nuts can be refrigerated for up to six months.
- Shelled or unshelled nuts can be frozen for up to one year.

Ground nuts (almonds, hazelnuts) can be used as a partial substitute for flour in a recipe. Ground nuts contain approximately 50% oil which will help to improve the richness of the biscuit or cookie.

Inclusion of fruit for biscuit production

Fruit is an important source of flavour and colour in bakery products. There is widespread use of variations to fruit fillings. They now come frozen, dried, whole, sliced and fresh. Because of the fruit, the biscuit will take longer to bake because of the moisture content. Fruit is generally better when it is fresh in season or picked when it is ripe and packaged correctly.

Dried fruits

Dried fruits are available in various grades for use in batters and similar. The most commonly used dried fruits used are:

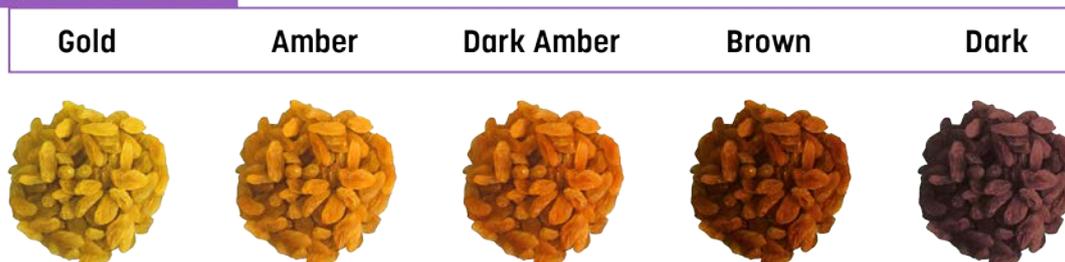
- Sultanas
- Currants
- Glace cherry
- Apricots
- Sliced apple
- Dates
- Prunes (plums)
- Figs
- Pineapple
- Cranberry

Grades of fruit

Dried sultanas are graded in crowns. The lighter the colour, the higher the crown, five is excellent. The grading was previously undertaken by a visual inspection; however, digital imaging analysis is now being used. For more information you can research objective measurement of dried fruit quality.

GRADES OF DRIED SULTANAS

COLOUR SPACE



© TAFE NSW

Preparation of dried fruits for use in bakery products

To help improve the qualities of the dried fruit, wash the fruit as follows:

1. Remove the fruit from the packaging and separate the pieces, removing stalks when using cheaper ingredients.
2. Place in a sieve or similar and remove all seeds, stalks and dirt in cold water.
3. Store in a container with an air tight lid.
4. For extended storage refrigerate.
5. Wash fruits as required and avoid having excessive moisture which may ferment in warmer weather.

Advantages of washing dried fruits

- Washing removes seeds, stalks and dirt, improving the eating qualities.
- The fruit becomes moister as the fruit is increased by the absorption of water (approx. 10%).
- The biscuit will stay more moist (less migration of moisture from the biscuit into the fruit).
- Extends the amount of batter making production more cost effective.
- Glace fruit (cherries, pineapple, apricot, etc.)

Most glace fruit may be cut into small pieces, approximately the size of a raisin or sultana for more even dispersion of the fruit through the biscuit. Remove any excess syrup from the fruits before cutting.

Glace cherries are available as either red or green glace cherries. When you purchase them you will find that they have been packaged in a sugar syrup. Before using, rinse off excessive syrup with cold water and allow to drain. Failure to remove the syrup will cause discolouration of the biscuit batter.

Candied fruits – mixed peel, candied lemon or orange peel.

Mixtures of chopped citrus peels are commonly used in conjunction with dried fruits. They are used as purchased or may be more finely chopped, as desired (no washing required).

Used straight from the box, they will not require treating or washing, but may require breaking up or loosening if clumped together. If the fruit content of recipe is soaked in alcohol overnight, add peel to the rest of the fruit as normal. When using a cheaper quality, some peel may be of uneven size and need further cutting.

Tree fruit (dates, apricots, apple, peaches, etc.).

Cut the fruit into small pieces approximately the size of a raisin or sultana for more even dispersion of the fruit through the cake.



Practice activity

Activity 5.1: Piping styles and production methods

1. Watch the video Piping Cookies:

<https://www.youtube.com/watch?v=cRxt8GC3wB8&t=186s>



2. What angle is the best for making the following piped biscuit style?

Style	Angle
Rosette	<i>30-degree angle</i>
Shell	
Circle	
Straight line	

3. Match the biscuits with the production method.

Savoardi Shortbread Brandy snap Choc chip cookie Biscotti
 Macaroon Gingerbread Anzac biscuit Monte Carlo Viennese

Production method	Biscuit type
Deposited (dropped)	
Piping	
Moulded and portioned	
Cut and portioned	



Self-check questions

Activity 5.2: Cookies and biscuits

Read the question carefully. Your answer should be a minimum of **25** words but no longer than **100** words.

1. List the characteristics of a good cookie.

2. Give three examples of a savoury biscuit.

3. If spotting occurs when you are making cookies, it is advisable to use what sort of sugar?

4. Why is it important for biscuits to be of a uniform shape and density?

Topic 6

Baking



Topic 6: Baking

This topic is about the baking process for biscuit and cookie products. It includes the prebake finish, temperature controls, loading ovens, monitoring and adjusting biscuits by sight, feel and touch. It also covers unloading the biscuit and checking for faults.

You will learn about:

- Baking the batter and dough
- Maillard reaction
- Coagulation
- Gelatinisation
- Pre-bake finish
- Temperature
- Spread
- Cooling

Preparing for baking

- Cookie dough should be soft and pliable; however, excessively soft doughs must be avoided, as they are difficult to handle and usually give a product of poor appearance.
- Hold back some of the liquid when mixing and add it gradually as required.
- Aerating agents should be weighed accurately; excessive quantities will cause off flavours as well as poor texture and colour.
- The use of parchment paper or silicone treated paper on the baking trays eliminates the need to clean the trays after each bake.
- Where trays are cleaned and greased, it is essential to achieve a uniform coating of oil. Too much oil will cause excessive spread while ungreased sections will prevent spread and cause sticking problems.

Any decoration, such as nut pieces or choc chips, should be done as soon as possible after the cookie has been deposited on the tray; this ensures adhesion and reduces damage in handling.

Temperature

Cookies should be baked in a relatively cool oven at approximately 180° C. Excessive heat will prevent the cookie from spreading to the desired shape.

Follow the recipe instructions for both temperature and time in the oven. Ensure you monitor the product to determine by sight if the product is ready and stable, and if adjustments are required. Adjustments include turning the tray in the oven for even baking, move the tray to other side of oven, and reduce temperature settings on either bottom/top heat.

Baking tip: To prevent burnt bottoms in rich doughs, double tray biscuits and cookies by placing the sheet tray on top of an upside-down tray. If your oven has a specialised wire for the base of the oven chamber, this can be used to prevent the burning of your biscuit bases.

Baking the batter and dough

The process of baking can be broken down into the following:

- Products containing chemical aerators gases are formed and expand.
- Any existing gases/air bubbles in the product will expand.
- The gluten and egg proteins present are stretched to form a new structure. These become firm (coagulate) and provide chewiness in the product.
- The starches present take on moisture and become firm (gelatinise).
- Some of the water evaporates.
- Fats melt and release air bubbles that, in the case of batter, help it to rise. The melted fat then deposits around cell walls and makes them shorter eating.
- Flavours develop and brown colours appear because of the caramelisation of sugar and the Maillard reaction.

In summary, a crust forms as water is driven off by the heat, a process that occurs first on the surface. The baking process involves heat absorption, gas formation, coagulation of proteins, gelatinisation of starches, vaporisation of water, melting of fats and development of flavours and colour.

The **Maillard reaction** is a chemical reaction between carbohydrates (sugar) and amino acids (proteins). In food, it has a profound effect on flavour, colour and aroma.

Coagulation is defined as the transformation of proteins from a liquid state to a solid form. Once proteins are coagulated, they cannot be returned to their liquid state. Coagulation often begins around 38°C (100°F), and the process is complete between 71°C and 82°C (160°F and 180°F). Within the baking process, the natural structures of the ingredients are altered irreversibly by a series of physical, chemical, and biochemical interactions. The three main types of protein that cause coagulation in the bakery are egg, dairy and flour proteins.

Gelatinisation occurs when granules of a starch product, such as flour or cornstarch, swell when they come in contact with a liquid.

Prebake finish is used on some cookies as a glaze with egg wash before going in the oven. It gives the final product a golden glossy colour or to enhance visual appeal.

Spread

Some recipes call for biscuit to hold their shape, other times spread is more desirable. There are several contributing factors for spread:

Increase in spread	Decrease in spread
Low oven temperature increases spread	High oven temperature decreases spread because the biscuit sets up before it gets a chance to spread
Heavily greased pans will encourage spread in the baking process	An ungreased pan will decrease spread
A light creaming of fat and sugar will increase spread (incorporates air into the dough)	Blending the fat and sugar to a paste in the creaming process (less air) will reduce spread
High sugar content or a coarse grain sugar increases spread	Fine or icing sugar reduces spread
High bi carbonate of soda or baking powder encourages spread	Activation of gluten and use of a strong flour decreases gluten
A slack batter with high liquid content increases spread	A stiff dough decreases spread
Unrefrigerated biscuit batter will encourage spread in the oven	Freezing or chilling the dough prior to baking will enable biscuits to hold shape

During the baking of the biscuits or cookies it is important that sufficient moisture is evaporated so that they will be dry and crisp. For large scale manufacturers who may give the biscuits a three month shelf life, the biscuit may contain as little as 3% moisture. This is very little moisture when you consider that flour contains approximately 12% moisture.

Baking tip: Monitor the baking processes often. Use sight and feel to assess the bake of the biscuit and cookie product, and adjust temperature, cooking times and spread accordingly.

Cooling

Some allowances should be made for the heat within the cookie which continues to bake and dry out during the first few minutes after removal from the oven. Cookies should be stripped from the trays, as there is a tendency to stick to the trays, and to lose bloom and appearance.

- Cookies baked without baking paper may stick to trays/pans. To avoid cookies sticking to the trays, remove them from the trays while they are still hot.
- Do not remove very soft cookies from the trays until they are cool and firm enough to handle, for example Anzac cookies and white chocolate and cranberry cookies.
- Remember some cookies are soft when they are hot, but once cooled they become more crispy.

Once your biscuits and cookies have cooled. Check them for faults and defects. Pay attention to the colour, size, texture, taste and look. Do you think your customers would be happy to pay the same price for each individual product?

Topic 8 will go into more detail on identifying, avoiding and rectifying faults. Although you should be looking out for any faults during the entire production process.

Baking tip: Every oven is different, so it is important to monitor regularly throughout the baking process.



Practice activity

Activity 6.1: Bake and analyse products

Bake the following products and once they have cooled, analyse each of the products by sight, smell, taste, softness, crispness and spread.

1. Bake 1 tray of coconut macaroons:
 - a. Directly on the sole of the oven
 - b. On a wire or double tray.

Ask your teacher for the correct temperature and time. Allow the macaroons to cool, then analyse and record your findings.

2. Bake 1/2 tray of Anzac cookies at 180C for the following bake times. Allow the biscuits to cool and analyse to record your findings. Bake times:
 - a. 8 minutes
 - b. 20 minutes
 - c. 30 minutes

Product variation	Findings
Macaroons on Sole of oven	
Macaroons on a wire or double tray	
Anzac biscuit – 8 minutes	
Anzac biscuit – 20 minutes	
Anzac biscuit – 30 minutes	



Self-check questions

Activity 6.2: The baking process

Read the questions carefully.

1. In your own words, explain the Maillard reaction.

2. In your own words, what does coagulation mean?

3. What heat is preferable when baking cookies and why?

4. When would spread in a biscuit be more desirable and why?

5. How can you use sight and feel to monitor the baking process?

6. What is the difference between radiant and conductive heat?

Topic 7

Finishing and decorating techniques



Topic 7: Finishing and decorating techniques

This topic is about finishing and decorating techniques to finish biscuit and cookie products. You will learn about:

- Preparing jams and creams
- Piping techniques
- Sandwiching
- Dusting
- Dipping
- Applying glazes, icings and garnishes
- Using chocolate
- Packing and storage

Preparing jams and creams

Jams

Precondition your jams before use by mixing well and spreading. Remove all lumps so they do not clog your piping bag, as this could create crumb drag whilst spreading with the palette knife. The jam should be free of lumps and can be either spread with a palette knife or piped on the biscuit.

There are specialised baking jams such as Rasplum Jam. This is specifically made for the baking industry. It is a seedless raspberry flavoured jam filling that is used in many bakery goods in Australia. It can be spread on sponge products or easily injected into other baking products like doughnuts and cream buns.

Ensure jam is stored correctly and there are no traces of mould or spoiling before using.

Creams

There are a range of creams used for filling sponge products. A few examples are:

- Fresh dairy cream – pure, thickened and whipping
- Imitation stabilised cream filling
- Mock cream
- UHT cream

Dairy cream

Fresh dairy cream is available in various forms. For an aerated cream filling the two most commonly used dairy creams are pure cream and thickened cream. Pure cream has a minimum butterfat content of 35%. Thickened cream (whipping) has the same required butterfat content but also contains a thickening agent, such as gelatine, rennet or similar. When whipped, the thickened cream will hold its shape for a longer time because of the thickening agent. Pure cream can be whipped with a cream stabiliser. The cream stabiliser is added with mixing in the sugar. It is usually a powder and is used to thicken and stabilise the cream.

Advantages and disadvantages of dairy cream include:

Advantages of dairy cream	Disadvantages of dairy cream
Has a natural butterfat flavour	Will only double its volume when whipped
Has a low melting point, hence it melts quickly in the mouth	Is highly perishable and must be kept refrigerated
Is a natural product	When whipped, will soften after a short period of storage – it doesn't hold its shape for long periods
Can be advertised as 'cream'	If it is over whipped it will turn to butter and buttermilk

Ingredient tip: *If your recipe calls for buttermilk and you don't have any, you can make your own. To make your own buttermilk, over whip dairy cream until it turns yellow and lumpy. Make sure that the biscuits are completely cold before filling with buttermilk or cream.*

Imitation stabilised cream filling

Imitation stabilised cream is an artificial cream, made to imitate fresh dairy cream.

Imitation cream is made from a mixture of:

- Water
- Vegetable oil
- Emulsifiers/stabilisers

- Milk solids
- Flavours

The fat content of imitation cream is not governed by legislation.

Imitation cream is to be handled in a similar way to dairy creams:

- Store under refrigeration (2°C to 4°C).
- Whip as required with the addition of 10% sugar and vanilla to a firm piping consistency.
- For best results, the cream, bowl and whisk should be well chilled before whisking.
- Avoid over-whipping the cream as it will become chalky and very crumbly.
- If the cream becomes over-whipped soften it with the addition of extra liquid cream.
- After whipping, store the cream under refrigeration.

Advantages and disadvantages of imitation cream include:

Advantages of imitation cream	Disadvantages of imitation cream
Has better keeping qualities than dairy cream	Lacks the flavour and mouth feel of dairy cream
When whipped, imitation cream will increase in volume threefold	It becomes 'chalky' and crumbly if stored for too long after whipping
Imitation cream is very stable; it holds its shape for longer than dairy cream	Lacks the natural cream colour of dairy cream (artificially white)
It has more whipping tolerance than dairy cream	

Mock cream

This is processed in the bakery and is made from icing sugar, sugar syrup and vanilla essence. It usually has a fat added (usually a cream shortening) to imitate fresh cream. Mock cream is used as a cost saver instead of fresh cream.

UHT cream

Ultra high temperature, or ultra heat treatment (UHT) cream, is a liquid that has a long shelf life and does not require refrigeration until it has been opened. This saves costs due to less wastage when demand is low. It can be kept on hand and used when production increases or on demand. It is helpful in regional areas where regular dairy deliveries occur less frequently.

Finishing techniques

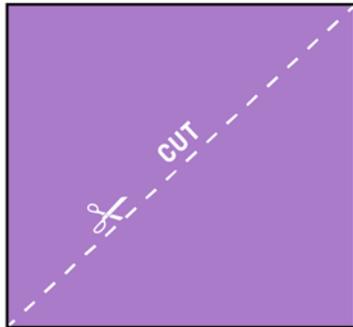
Piping techniques

Making piping bags

When making a making bag the paper should be of a good grade greaseproof or silicon paper. One single sheet will make eight bags of appropriate size for working.

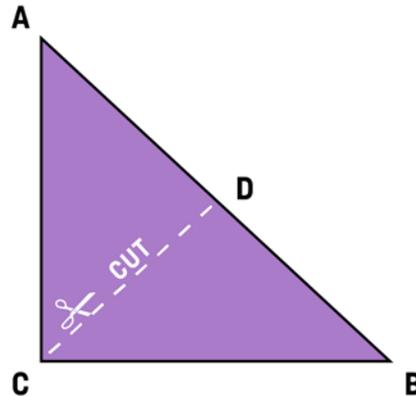
The following graphic demonstrates one method on how to make a piping bag. This will be accompanied with a practical demonstration from the teacher, as there are a couple of different techniques that can be used.

HOW TO MAKE A PIPING BAG



Step 1

Take the sheet, lay it out landscape fashion on the bench and fold in half from left to right, creasing well after each fold is made. Cut in two.



Step 2

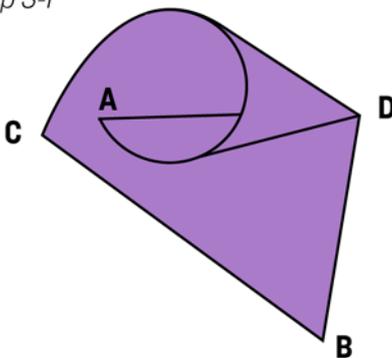
Lay the halves on top of each other and fold again, this time diagonally. Cut and place together - matching the triangles neatly on top of each other.

Fold again, this time down the cut edge to create triangles of similar shape/size and make the last cut to produce eight triangles.

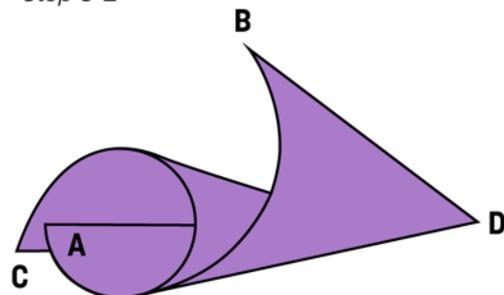
Step 3

Follow the next steps to learn how to make a pointed cone shape for the piping bags.

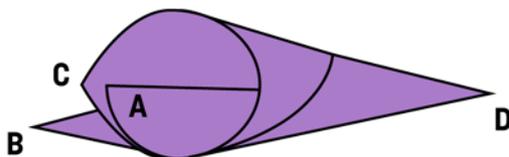
Step 3-1



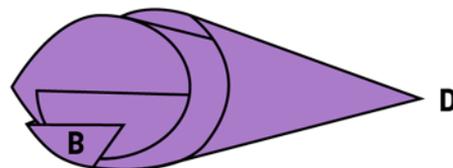
Step 3-2



Step 3-3



Step 3-4



Step 4

Finally, the 'pointy' end is cut away in which to place the tube. Take care not to cut off too much of the point of the cone, as the tube will fall through.

Note: Partially fill with the piping medium (such as buttercream, icing, or biscuit batter) to be used. Once again care has to be taken not to overfill the bag as the medium will run out of the top of the bag during piping.

Tools, equipment, care and preparation

Your toolkits will be stocked with basic baking decorating equipment and should include the following:

- a selection of piping tubes
- scissors
- palette knife – small and large
- paint brush
- spatula
- cooks' knife.

As you advance through your training and develop your skills it will become evident that your basic toolkit requires extra tools and equipment to tackle new demands. Additions to the toolkit may include:

- cutters of various shapes/sizes
- more brushes of differing sizes
- moulds and flower shaped presses
- specialised pieces of equipment
- spare scissors, spoons, skewers, etc.

To avoid damage or loss, all equipment requires careful cleaning and storing.

One common problem with the piping tubes is the cleaning out of icing after use. To avoid the frustration of blocked tubes, soak them immediately in hot water, using a small paint brush to get all the residual icing out of the bottom of the tube, rinse well again in hot water as sugar dissolves in water.

Damage to the ends of the tube will affect the performance. Store these in a separate container away from sharp knives so as to avoid damage to the tubes.

If you have separate storage compartments for sharp knives and blunt equipment, you will avoid accidental damage to both sets of tools, as well as accidental cuts to yourself.

Safety tip: Do not put your finger in the tube to try and remove the icing. Fingers do get caught!

Basic line piping techniques

Once the icing is made, cover it with a damp cloth to prevent drying out and eventual crusting – even small hard sugar lumps will cause blockages in the tube.

Insert the piping tube in the bag, half fill with icing and fold down the top of the bag to prevent overflow.

When the piping bags are filled, wet a paper towel, fold it over and lay it across the ends of the tubes to prevent hardening of the sugar at the tips.

Lay out any other tools or equipment. You will need on a clean tea towel close at hand... then you're ready to go.

Your teacher will demonstrate the correct technique to hold the bag for piping.

The two techniques are:

1. Using a small piping bag. Use the thumb and first two fingers to hold the bag like a pen. A controlled squeeze on the piping bag will give an even flow of the icing. This method of holding the piping bag is most suitable for small tubes and finer work.
2. Using a larger piping bag. Lay the piping bag in the palm, close the hand and use the four fingers to provide the pressure together and evenly. Support may be given with the other hand, by holding the wrist steady. This technique is suited for using larger tubes requiring larger amounts of icing.

Don't forget, these are suggested methods for your guidance only. You may develop your own comfortable method of working.

Your teacher will demonstrate a variety of piping techniques including: dropped, inscribed, scalloped, beaded, rope and dotted lines, some of which are shown below. You will practice piping using a selection of plain and star tubes.

This will be followed by practice.

EXAMPLES OF PIPING TECHNIQUES

Dropped line, parallel



Inscribed line, scalloped



Beaded line



Dotted line



Scrolls



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Use of colour

In a bakery there are three types of food colours available: liquid, gel and powder.

Liquid and gel are the most commonly used. They all have different uses and applications. Food colours are also available, some that dissolve in water and some that dissolve in fat or oil. As most bakery products contain a high level of water most bakers use the colours that dissolve in water. If you are making a product that is based on fat, such as a cream filling for biscuits, then it is advisable to use a colour which dissolves in fat.

Liquid food colour

Liquid food colours come as either gels or liquids. The main difference between liquid and gel food colours is dilution. Gel colours (which contain less liquid) are more concentrated than traditional liquid colours, so less of the product is needed. This is important if the recipe requires minimal added moisture.

Advantages and disadvantages of liquid food colour include:

Advantages	Disadvantages
The colour is easily mixed into the icing.	Concentration levels cannot be changed – unless you want to dilute it.
The colour is ready to use – no preparation required.	The liquid colour can water down icing too much if strong colour is needed.
Needs no special storage requirements, only a lid to prevent spills.	Strong or deep colouring of icings may require large amounts of liquid food colour.

Powder food colour

Powders are used when a very strong colour is required. The powder must be moistened with water and mixed to a paste before adding to the product to be coloured, this will help to prevent streaking.

Advantages and disadvantages of powder food colour include:

Advantages	Disadvantages
The colour can be made in different concentrations or diluted as required.	Not always available in smaller measures.
The colour in powder form has good keeping qualities. Store it away from moisture.	Difficult to use when mixed with decorating mediums such as icing. Streaking of the colour can occur if not properly mixed.
The powder colour can be made into liquid by dissolving in boiling water.	Deep staining can occur in contact with clothing, etc.

Sandwiching

Sandwiching refers to the process of placing two biscuits together with a filling in between. The biscuits should be uniform in size and shape for good visual appeal. A variety of fillings can be used. Fillings suitable for sandwiching:

- Cream
- Chocolate
- Cream cheese
- Buttercream
- Jam
- Lemon curd
- Ganache
- Peanut butter
- Ice cream

Dusting baked products

Dust or dusting refers to the process of lightly sprinkling a fine layer of powder or granulated ingredient on top of biscuits or cookies. It is often used as a finishing technique or to add flavour. Ingredients commonly include sugars and powdered sugars, spices and cocoa powder. A fine sieve is used to ensure fine and even dusting.

Note: Dusting is also sometimes referred to when dusting a pan with flour in preparation of baking or dusting a work surface to stop doughs from sticking.

Dipping

Dipping is an easy option for decorating biscuits. Baked biscuits can be dipped in a variety of finishes. The most common finishing ingredients are chocolate, ganache and fondant.

Melting techniques are discussed further throughout this topic.

Applying glazes or icings

Icing is a term used both for the action of covering a biscuit and for the covering itself. There are many variations to ice a biscuit. Some recipes refer to icing as frosting, particularly in American recipes.

Types of icings and their ingredients include:

Types of icings	Ingredients
Water glaze	Icing sugar and water
Buttercream	Unsalted butter, sugar and egg
Cream cheese icing	Icing sugar, cream cheese and butter
Fondant	A1 sugar, water and glucose
Meringue	Castor sugar and egg whites
Royal icing	Pure icing sugar, egg whites and acetic acid
Ganache	White or dark chocolate and cream

Ready to roll fondant (plastic icing)

Covering products using ready-to-roll

Ready-to-roll icing is a sugar paste made from icing sugar, glucose, white fat, gelatine with a little acid added. When manipulated it becomes flexible enough to pin out and use as a covering or a medium for modelling, hence the name ready-to-roll icing being used to describe this sugar paste.

It may also be known as plastic icing or fondant icing in some American decorating books.

It is easily coloured and will smooth out evenly when worked and covers uneven surfaces of cakes to provide a perfect base for royal icing work.

It is readily available for the baker and decorator or it can be made. Various recipes are available.



Christmas cookies by [rawpixel](#) under [Pexels licence](#)

Icing sugar

Icing sugar mixture is often used in the bakery and can be mistaken for pure icing sugar. Pure icing sugar is made by grinding crystal sugar into a powder. Icing sugar mixture is made by mixing pure icing sugar with starch; approximately 5% starch is added. The starch is added to help prevent the sugar from forming lumps.

Here are two simple tests to determine whether the sugar is icing mixture or pure icing sugar.

Test 1: The water mixing test – testing for cloudiness caused by the starch.

1. Mix approximately one tablespoon of the sugar with a beaker of water.
2. If it is pure icing sugar it will dissolve in the water and the water will remain clear.
3. If it is icing mixture the water will become cloudy from the starch content, as starch is not soluble in water.

Test 2: The iodine test – testing for colour change.

1. Add a couple of drops of iodine onto the sample of sugar.
2. If it is pure icing sugar the iodine will remain yellow in colour.
3. If it is icing mixture then the iodine will turn purple in colour because of the presence of the starch.

Chocolate

Types of chocolate:

Types	Ingredients
Couverture chocolate	Chocolate liquor, cocoa butter, sugar, milk solids, vanilla and lecithin.
Compound chocolate	Roasted cocoa bean, finely milled sugar, various vegetable fats and emulsifiers.

Forms of chocolate:

Forms	Ingredients
Dark chocolate	Chocolate liquor, cocoa butter, sugar, vanilla, lecithin
Milk chocolate	Chocolate liquor, cocoa butter, sugar, milk solids, vanilla and lecithin.
White chocolate	Cocoa butter, sugar, milk solids, vanilla and lecithin.

Preparation of chocolate for use

‘Tempering’ the chocolate

This is the process of stabilising the fat crystal formations in the chocolate by temperature, agitation and time.

The cocoa butter in the chocolate is made up of six fat crystal formations.

When the chocolate is melted and the crystals are in the beta crystal form, the chocolate sets and all of the crystals take on this stable form. It is this crystal formation that gives the chocolate the desired gloss, ‘snap’ and shelf stability.

Melting and tempering of chocolate:

- Break chocolate into small pieces and place in a clean, dry stainless steel bowl
- Melt slowly over gentle source of heat – double saucepan
- Stir occasionally with a clean dry spoon to a temperature of approximately 45°C, take care not to scorch the chocolate
- Remove from the heat source and cool the chocolate to 28°C, either by placing on a marble slab to cool (referred to as tabling) or by adding small/grated pieces of solid chocolate to lower the temperature (seeding the chocolate)
- Reheat the chocolate over the gentle source of heat to 32°C

Note: Check with the manufacturer of your chocolate for specific temperatures to be used for tempering – different chocolates use slightly different temperatures.

Bloom

There are two types of bloom that are considered as faults on chocolate:

Fat bloom	Sugar bloom
Appears on the surface of the chocolate as white/grey patches. It is caused by extremes of temperature.	Appears on the surface of the chocolate as a dull grey rough surface. It is caused by extremes in humidity.

Couverture chocolate

Advantages and disadvantages of couverture chocolate:

Advantages	Disadvantages
Superior flavour.	Additional skills and time required to temper the chocolate.
Better eating qualities due to the fats with a low melting point, and smoothness in the mouth.	Requires controlled room temperatures and refrigerated cooling for setting the chocolate.

Compound chocolate

This type of chocolate is very different to couverture, as the cocoa butter is substituted with vegetable fat –made by mixing cocoa, vegetable fat and sugar together. The fat used has a high melting point and does not require the same melting, cooling and reheating, as does the couverture chocolate.

Melting and preparing compound chocolate

- Break the compound chocolate into small pieces and place in a stainless steel bowl
- Melt slowly over a gentle source of heat – double saucepan
- Stir occasionally with a clean dry spoon until completely melted, approximately 45°C
- Allow to cool slightly before use

Points of importance when handling chocolate – caution:

- do not allow water or steam to come in contact with the chocolate
- melt the chocolate slowly over a gentle source of heat
- stir the chocolate well before using
- break the chocolate into small pieces to aid the melting process
- the chocolate will burn if left for too long over hot water
- chocolate easily takes up foreign odours, such as spices, ensure you store separately
- goods to be covered with chocolate should have the chill taken off them
- chocolate should not be stored in the coolroom

- chocolate goods that have been cooled in the refrigerator must not be subjected to a warm atmosphere too suddenly – this will cause condensation on the surface of the chocolate
- when removing the bowl of chocolate from the pot of hot water immediately wipe the water from the base of the bowl to avoid water from dripping into/onto the chocolate
- wear cotton gloves to avoid handling the set chocolate with your bare hands which will leave fingerprints on the surface of the chocolate.

Advantages and disadvantages of compound chocolate:

Advantages	Disadvantages
More easily prepared/melted for use.	Lacks the flavour of couverture chocolate.
Quickly melted/prepared.	Has inferior eating qualities due to the high melting point of the fats.
Can withstand high bakehouse temperatures.	Cracks when cut as a coating on top of a product.
May be set in a cool position without the use of refrigeration.	

Note: White and milk chocolate are more sensitive to heat than dark.

Piping chocolate shapes

Use tempered couverture or compound chocolate and pipe through a small paper piping bag directly onto the product being decorated. Alternatively, pipe shapes onto greaseproof paper, allow to set and place on the product as required. Pre-piped shapes can be made in advance and be on hand to save time.

To produce uniform shapes and sizes, place an image of the pattern under the greaseproof paper onto which you trace the shapes. To avoid spills or mess take care not to over fill the piping bag.

Cutting chocolate shapes

Pour the melted chocolate onto a sheet of clear acetate, plastic or paper, then spread evenly and reasonably thin.

Allow to cool and when just set cut into small shapes using cocktail cutters of various shapes, cut into squares or diamonds using a paring knife, or cut crescent shapes using a round cutter.

When completely set, carefully peel the plastic or paper away from the shapes – store the cut shapes in an airtight container and in a cool position.

These simple shapes described above are cost effective and allow the bakery staff an opportunity to extend their profit margins and skills. Chocolate shapes are readily available from suppliers but come at a cost.

Packaging and storing

To keep the crispness and fresh aroma of cookies it is necessary to maintain a very low moisture content and prevent absorption of atmospheric moisture. Sealed packaging in a flexible moisture-proof film is most suitable for distribution. Pre-formed bags, which can be heat-sealed or securely tied, are hygienic, convenient and economical on a small scale. For large-scale production, the use of moisture proof cellulose and polypropylene films is most suitable in high-speed machine packaging and gives a brilliant appearance for presentation.

For direct sale and shop display, large jars with good fitting lids are convenient and effective storage containers. The freshness of some cookies may be extended by reheating and these may be sold conveniently in foil-laminated bags with instructions for the reheating operation.



Practice activity

Activity 7.1: Decorating biscuits

1. Practice making a piping bag from paper. Watch your teacher demonstrate various piping styles and then practice.
2. What is the correct process for melting the following types of chocolate?

Type of chocolate	Temperature for melting
Compound chocolate	
Couverture chocolate	

3. Research decorating ideas for shortbread biscuits based on special occasions. For example: Easter, Christmas, Valentine's Day, Halloween and Birthdays.
4. Design a product using either Floodwork, RTR or Fondant and then decorate a shortbread biscuit.



Self-check questions

Activity 7.2: Making biscuits and cookies

1. In your own words, explain the sandwiching process for biscuits.

2. What are the most common finishing ingredients for dipping biscuit?

3. What are common ingredients used for dusting biscuits?

4. Describe three ways you could fill or finish biscuits using chocolate.

5. How should biscuits and cookies be stored and packaged to keep fresh and crisp?

6. Which ingredients control the 'spread' of a cookie dough?

7. Describe the best cooling procedure for cookies.

8. Name three special occasions that use different packaging to enhance biscuit sales.

9. Name two finishing mediums for Viennese biscuits.

10. Name two finishing mediums for Brandy snaps.

11. What can be added to fresh dairy cream to stabilise it?

12. What is the fat content for dairy cream?



Collaboration

Activity 7.3: Research finishing ingredients

Break into groups and each choose one of the following finishing ingredients:

- Pashmak (cotton candy)
- Ruby chocolate
- Coconut oil
- Glace pineapple
- Muscovado sugar
- Carob chips

Then research the finishing ingredient with the following information:

1. Name the ingredient and any associated ingredients.

2. Where and how did it originate?

3. How is it processed?

4. When is it commonly used?

Topic 8

Quality and faults



Topic 8: Quality and faults

In this topic you will learn about checking biscuit and cookies throughout the production processes to eliminate faults and wastage to produce consistent quality products. Baking staff are required to plan organise and implement tasks required to achieve production outcomes, and this involves interpreting key information from recipes, ingredient labels, baking equipment, operating instruction and end-product specifications. .

You will learn about:

- Crispness
- Softness
- Chewiness
- Fruit sinking during baking
- Common faults

The characteristics of a good cookie are softness and crispness. Over-mixing will cause the product to be tough and 'chewy' (unless this is the desired effect like an Anzac biscuit). Throughout this learner resource we have learned about faults in biscuits and cookies which can be caused from various steps in the production process.

Crispness

The lower the moisture content, the crispier the biscuit.

Contributing factors for crispness:

- Using a stiff dough – with a lower proportion of liquid in the mix.
- Higher sugar and fat content allows mixture of a workable dough with low moisture.
- Baking over a longer period to evaporate moisture. A convection oven dries more quickly contributing crispness. By opening the damper to allow steam to escape will create a drier baking chamber.
- Biscuits will dry faster during baking if they are small or thin.
- Crisp biscuits will soften as they absorb moisture, so ensure proper storage.

Softness

Softness is the opposite of crispness, so it has the opposite causes.

Contributing factors for softness:

- Low sugar and fat.
- Higher proportion of liquid in the dough.
- Under baking.
- Larger or thicker shaped biscuits retain more moisture.
- Hygroscopic sugars (honey, molasses or corn syrup) absorb moisture from the air or from their surroundings.
- Soft biscuits will dry out and stale if not wrapped tightly or covered.

Chewiness

Moisture is required for a chewy biscuit or cookie. However, there are other important factors:

- High proportion of eggs
- Low fat content, high sugar and liquid content
- Strong flour or gluten developed during mixing

Common faults in biscuit and cookie production include:

Common faults	Cause
Too crumbly	<ul style="list-style-type: none"> • Not enough eggs • Improper mixing • Too much sugar • Too much shortening • Too much leavening
Too hard	<ul style="list-style-type: none"> • Not enough liquid • Not enough shortening • Too much flour • Flour too strong • Baked too long or temperature too low

Common faults	Cause
Too tough	<ul style="list-style-type: none"> • Too much flour • Flour too strong • Not enough shortening • Incorrect amount of sugar • Mixed too long or improper mixing
Too dry	<ul style="list-style-type: none"> • Not enough shortening • Not enough liquid • Baked too long or temperature too low • Too much flour
Too brown	<ul style="list-style-type: none"> • Temperature too high • Overbaked • Too much sugar
Not brown enough	<ul style="list-style-type: none"> • Not enough sugar • Under baked • Baking temperature too low
Not enough spread	<ul style="list-style-type: none"> • Temperature too high • Too much flour or flour too strong • Not enough sugar • Sugar too fine • Not enough leavening • Not enough liquid • Insufficient pan grease
Sugary surface or crust	<ul style="list-style-type: none"> • Improper mixing • Too much sugar
Poor flavour	<ul style="list-style-type: none"> • Poor quality ingredients • Dirty baking pans • Ingredients improperly measured • Flavouring ingredients left out

Common faults	Cause
Stick to pans	<ul style="list-style-type: none"> • Pans improperly greased • Too much sugar • Improper mixing
Too much spread	<ul style="list-style-type: none"> • Temperature too low • Not enough flour • Too much sugar • Sugar crystal too coarse • Too much leavening • Too much liquid • Pans greased too heavily



Practice activity

Activity 8.1: Baking process faults

Using the cookie images below, (with cookie number 6 as the control cookie) assess the cause of the fault and using your understanding and experience of the baking process; determine how to avoid the problem in the processing stage.



Copied under s113P, <https://www.yuppiechef.com/spatula/common-cookie-problems-and-how-to-avoid-them/> accessed 01.02.2019

Fault picture	Reason for the fault and how to avoid it
1.	
2.	
3.	
4.	
5.	
6.	Control cookie (optimum result)



Self-check questions

Activity 8.2: Thinking about faults

1. How can you avoid burning biscuit and cookie bottoms during the baking process?

2. Why is it important to pre-heat the oven before loading the products into the oven?

3. What are common causes of biscuits with poor flavour?

4. Describe three ways you could fill or finish biscuits using chocolate.

Topic 9

Packing up and cleaning down



Topic 9: Packing up and cleaning down

This topic discusses how to complete your work in the bakery workplace. You will learn about:

- Cleaning equipment and your work area
- Disposing of waste
- Completing workplace records

Cleaning and disposing of waste as you work ensures the bakery workplace runs efficiently and is safe for everyone.

Your workplace will have processes or instructions that they want you to follow and it is important for you to understand these and the personal responsibilities you have.

Cleaning equipment and your work area

Cleaning equipment so that it is ready to use for the next day or next time is an important step in your work routine. Equipment may include machinery and electrical equipment, kitchen implements and tools, baking tins and trays, racks, ovens, bench tops, walls, sinks, storage shelves, display cabinets and floors.

During cleaning processes it is important to work safely and follow your workplace instructions. You can do this by:

- Understanding the toxicity of any cleaning materials you are using – MDS sheets
- Using personal protective equipment to prevent skin reactions and injury
- Working safely, especially with water near or with electrical equipment
- Ensuring all equipment and products for cleaning are used correctly and re-stored after use
- Ensuring you use signage on mopped floors
- Follow workplace instructions if more cleaning products are needed or there are any difficulties with cleaning any products

Completing workplace records



Maintain records

Workplace records refers to any documents that your workplace needs you to complete as you do your work in the bakery. Examples include:

- accident/injury forms
- maintenance requirements on equipment
- production schedules
- order forms for ingredients or stock needs
- food safety documentation, such as storage temperature readings
- stock records, such as stock that has been sold and/or disposed of.

Disposing of waste

Bakery waste includes food products, water and packaging material. Following a production schedule or recipe formula and measuring accurately reduces the likelihood of wasted ingredients and products. Stock which can't be sold may be able to re-purposed or given away. Some other ways of disposing of waste include:

- Metallic scrap, wooden pallets, spent oil from machinery, fat and oil can be sold to recyclers and scrap merchants.
- Burnt, unsold, damaged bakery goods can be used for cattle feed rather than rubbish.
- Using recyclable or earth friendly packaging.

Wastage in production must be less than 5% of the weight of the original production schedule. Any variation from this should be recorded on the production schedule so that this can be checked to avoid similar outcomes in the future.

Notes:



Practice activity

Activity 9.1: Documents and waste disposal

Think about your workplace or the TAFE kitchen/bakery:

1. What documents have you completed as part of your work?

2. How do you dispose of waste?



Self-check questions

Activity 9.2: Production schedule and waste disposal improvement

1. Why is it important to record the result of your baking on the production schedule?

2. Give two examples of ways to improve disposing of waste in a commercial bakery economically?

Glossary

Common words and terms specific to making biscuit and cookie products are provided in the Glossary. Talk to your trainer if you can't find what you are looking for.

Common words	Description
Absorption	Refers to the ability of a flour to hold water in the required amounts to form a dough of a workable consistency.
Acetic acid (ethanoic acid)	The organic acid responsible for the acidity of vinegar, which contains 4% acetic acid.
Acidic	A substance with a pH less than 7.0 is said to be acidic. The lower the pH value the more acidic the substance.
Aerobic respiration	Cellular respiration requiring oxygen where glucose is broken down to release energy in a series of steps.
Air classification	Refers to flour milling whereby the flour particles are separated according to size and density by the use of air currents.
Alkaline	A substance with a pH greater than 7.0. The higher the pH value the more alkaline the substance.
Amino acid	The basic component of proteins composed of an amino group (NH ₂), a Carboxyl Group (COOH) and which possess both alkaline and acidic properties.
Amylograph	An instrument used for the determination of the amylase activity of a flour, by measuring the effect of the flour amylase in reducing the viscosity of a flour-water paste.
Antioxidant	A material which, when added to a shortening, extends shelf life by protecting it against oxidation. In biscuit baking antioxidants may be used to extend the storage life insofar as rancidity is concerned.
Ascorbic acid (vitamin C)	A water soluble organic compound found in citrus fruits and some vegetables. It may be used in the absence of oxygen as a reducing agent or oxygen scavenger to prevent oxidation of foodstuffs.

Common words	Description
Baking	The transformation of dough by the use of heat application into a light porous product which is palatable and digestible.
Best before date code	On most products with this coding, the product exhibits its best performance characteristics before the "Best Before" date on the product when handled and stored correctly.
Boiling point	The temperature at which the vapour pressure of a liquid equals the absolute external pressure at the liquid-vapour interface. When this happens the liquid boils.
Calorie	Heat required to raise the temperature of 1 gram of water by 1°C. 1,000 calories equal one great calorie or kilo calorie. The calorie used in diet calculations is the kilo calorie.
Carbohydrate	Substances that contain carbon, hydrogen and oxygen. Simple sugars through to complex starches and cellulose. One of the major groups of organic compounds.
Carbon dioxide	A gas produced by the action of yeast on sugar, or by baking powders. It is the same gas found in carbonated beverages. When dissolved in water it forms carbonic acid, which is partially responsible for the increase in acidity of a dough or sponge caused by fermentation.
Carrier	An ingredient, usually flour, used as a base that allows accurate measuring of another ingredient or combination of ingredients contained within the carrier in minute amounts.
Catalyst	A substance that increased the speed of a reaction in the chemical change of other substances without itself undergoing change. Enzymes are examples of a catalyst.
Centigrade	A thermometric scale, in general use in many countries, in which 0° represents the freezing point and 100° the boiling point of water at sea level. To convert Fahrenheit degrees to Centigrade degrees, subtract 32 from the Fahrenheit temperature. Then, multiply the result by five. Finally, divide this number by nine.

Common words	Description
Clear	A final stage of dough development. When the dough has achieved a smooth silky texture, and translucent appearance.
Compound	A substance composed of two or more elements, substances or products, with a constant composition. A compound is never a simple material.
Denaturation	The transformation of a protein by the application of heat into an insoluble form.
Dextrin	A polysaccharide carbohydrate, primarily a product of the break down of starch by amylase enzymes.
Dextrose	See Glucose.
Disaccharide	A double sugar made up of monosaccharide molecules linked together. Maltose, lactose and sucrose are all disaccharides.
Elasticity	Dough has an elastic limit of approximately 30%, contributed in dough by developed gluten.
Emulsification	Formation of a dispersion of small droplets of one liquid in another, in which it does not dissolve.
Emulsifiers	Emulsifiers reduce surface tension between two immiscible substances, such as oil and water, enabling them to form a stable mixture or emulsion.
Enzyme	A protein molecule that catalyses a biochemical reaction. Enzymes are usually specific to particular substrates and are sensitive to pH and temperature.
Enzyme, fungal	An enzyme prepared from a mould.
Extensibility	The amount of pressure applied to the stretching of a dough without causing rupture or tearing. Usually this test is applied to a dough using the extensograph.

Common words	Description
Farina	Wheat middlings-coarse endosperm particles containing the starchy portion of the wheat. Farina can be further processed into white flour.
Farinograph	A small recording dough mixer in which the consistency of a flour-water dough or other dough may be measured throughout the entire mixing process.
Fat	A fat has the same type of composition as an oil, the difference being that a fat has a higher melting point and is a plastic-solid at room temperature. Both are triglycerides made up of three molecules of fatty acid and one molecule of glycerine.
Flavour	The total sensation experienced when baked goods are taken into the mouth, including taste, odour and mouth feel.
Freezing point	Temperature at which a given liquid substance will solidify or freeze. The freezing point of water is 0°C (32°F).
Fructose (levulose)	A monosaccharide usually found together with glucose in many fruits. Also combines with glucose to form sucrose. It is one product of the action of the enzyme invertase on cane sugar.
Gelatinisation	The swelling and bursting of a starch cell in solution when heat is applied usually above 60°C, with the resulting uptake of free water to form a paster or gel.
Germ, wheat	The embryonic wheat plant found in each grain of wheat. The germ is high in oil content but contains compounds which have a retarding effect on bread doughs.
Gliadin	One of the main proteins found in wheat flour. It is insoluble and combines with glutenin and to a lesser extent, globulin in a dough to form gluten. Present in approximately equal proportion to glutenin. See Gluten.
Globulin	A group of proteins that are soluble in salt solution and coagulated by heat. They combine with gliadin and glutenin to form gluten. See Gluten.

Common words	Description
Glucose	Another name for dextrose. A single sugar unit (C ₆ H ₁₂ O ₆).
Glucose syrup	A solution of glucose, maltose and dextrans, made by the breakdown of starch. Also known as corn syrup.
Gluten	A mixture of proteins that provides the framework for the characteristics of baking with dough. Gluten is primarily divided into two main groups of proteins, gliadin and glutenin, which have different functions in baking. To a much lesser extent a third group of proteins, globulins, also makes up gluten.
Glutenin	One of the main proteins found wheat flour. It is insoluble and combines with gliadin and to a lesser extent, globulin in a dough to form gluten. Present in approximately equal proportion to gliadin. See Gluten.
Glycerine (glycerol)	A water soluble liquid manufactured from fats and oils. Glycerine is used in the baking industry to retain moisture in baked goods.
Glycerol monostearate (GMS)	A monoglyceride, made up of one molecule of a fatty acid (stearic acid) combined with one molecule of glycerol.
Grain	The character of the cell structure and size of crumb cells. The grain should be moderately close, even and firm, with small, elongated, thin-walled cells. The “grain”.
Homogenise	The process of making a stable suspension of oil in water or water in oil. In the homogenising process either the water or the oil droplets are divided so finely that separation is slow. Broadly used in the baking industry, homogenising refers to fine dispersion of ingredients. Emulsified shortenings, salad dressings and ice cream are examples.
Humidify	To add water vapour to the atmosphere; add moisture to any material.
Humidity	Water vapour content in the atmosphere; at ambient temperatures.

Common words	Description
Humidity, relative	The ratio of the amount of water vapour present in the air to the amount of water vapour present in saturated air, at the same temperature and barometric pressure. This ratio is usually expressed as a percentage.
Hydrogen ion	The chemical entity which is responsible for the acidity of acids. A substance which forms a high concentration of hydrogen ions when dissolved in water is considered to be strongly acidic.
Hydrogenated fats/oils	Fats and oils treated with hydrogen to give types of shortenings which have a higher melting point. Hydrogenated fats and oils also have less tendency to become rancid by oxidation.
Hydrophilic-lipophilic balance (HLB)	Low HLB surfactants are Lipophilic, or “fat loving”. HLB value: 2-4. High HLB surfactants are Hydrophilic or “water loving”. HLB value: 13-20. Surfactants in the mid-range exhibit little tendency to form emulsions.
Hygrometer	A device for measuring the humidity of air or gasses. Used frequently in the bakery as a guide for the control of the moisture in air coming in contact with fermenting doughs or sponges.
Hygroscopic	Absorptive of moisture; readily absorbing and retaining moisture.
Invertase	An enzyme occurring in yeast which converts sucrose (cane sugar) into invert sugar.
Kilojoule	The metric unit used to express the energy value of food.
Lactose	Disaccharide (glucose and galactose) found in the milk of mammals. Lactose is converted to lactic acid by bacteria present in milk.
Lecithin	An emulsifying agent found in several bakery ingredients such as egg yolk and soya flour or oil. The lecithin sold to bakers is mostly soy lecithin. Chemically lecithin is a fatty substance containing phosphorus.
Lipase	An enzyme that breaks down fat into free fatty acids and glycerol.

Common words	Description
Matrix – gluten matrix	Formed by combination of glutenin and gliadin (insoluble proteins found in flour) and water. Developed into a network of strands through the stretching action of the mixer on the dough etc.
Monoglyceride	A simple emulsifier comprising one molecule of a fatty acid combined with one molecule of glycerol. The resulting compound has a water soluble (“hydrophilic”) end – the glycerol end – and the other end is oil soluble (“lipophilic”) – the fatty acid end.
Monosaccharides	Simple sugars, such as glucose and fructose. They are the basic units of more complex sugars. (C ₆ H ₁₂ O ₆).
Mould	An infection caused by contamination after the product has been baked, for example of bread or cake. Yellow, green, black, white and red bread moulds occur. Moulds are related to fungi.
Mould inhibitors	Compounds which can be added to bread or cake doughs or batters prior to baking, to delay or inhibit mould development.
Oil (see fat)	A triglyceride which is liquid at ambient temperatures.
“Oil in Water” (dispersion)	A term to describe the dispersion of oil in water where the proportion of water exceeds the proportion of oil and in which the water is the continuous phase.
Optimum	The best or most favourable conditions.
Osmosis	The transfer of fluid through a permeable cell wall without rupturing of the cell wall, resulting in an equalising of pressures across the cell wall.
Oven spring	The difference in the size of the unbaked product to the baked product attained in the oven.
Oxidant	A compound that brings about the chemical change known as oxidation.

Common words	Description
Pasteurisation	A method devised by Louis Pasteur of partially sterilising certain foods, such as milk, by heating to approximately 62°C for 30 minutes. Modern methods utilise higher temperatures and shorter times (72°C for not less than 15 seconds).
Peptide	Compound formed by the combination of two or more amino acids.
pH	The pH scale 1 – 14 describes the degree of acidity or alkalinity of a substance. Acid substances fall below 7.0, alkaline substances fall above 7.0 with water being neutral, at 7.0.
Plasticity	When pressure is applied to a substance, which changes the shape of the substance, and that force is removed yet that substance retains the new shape permanently, it is said to be plastic. Under pressure, plastic substances behave like fluids, otherwise they behave like solids. Over mixing of a dough breaks the gluten coils which can result in a more plastic characteristic in the dough than may be desired. Starch contributes to plasticity in doughs.
Polysaccharides	Contain many monosaccharide units. Starch, gums and cellulose are examples of disaccharides joined together in chains and branches to form complex molecules.
Porosity	The openness or closeness of grain.
PPM	Parts per million (abr.).
Protease (proteinase)	An enzyme that acts upon the proteins in the dough to produce greater dough extensibility.
Protein	Nitrogen containing compounds occurring in all living matter. Chemically proteins are chains of amino acids, combined through peptide linkages. Examples are gluten (from wheat), casein (from milk), gelatine (from skin) and albumen (from egg and soya).
Rancidity	A condition of being rancid usually applies to fats and fatty foods. The main type of rancidity is oxidative. It is manifested by the appearance of an objectionable odour. This type may be responsible for off-flavour in bakery products, especially under long storage. Anti-oxidants have the effect of delaying the onset of such rancidity.

Common words	Description
Recipe	The precise formula of ingredients, quantities and method required to produce a particular product.
Reduction	The reverse process of oxidation. Disulphide bonds are broken (softening) and teased out, opening the gluten strand, so that it will subsequently link up to reform disulphide bonds in a three dimensional network. Reducing agents gain electrons.
Sheen	Reflection from the cell surfaces of the crumb.
Shortening	A fat, or fatty preparation, used in the production of bread, cakes and other bakery products. It derived its name from its effect in making the product short and tender.
Shred	Character of surface within the break. The break may be smooth, ragged or broken.
Solubility	The extent to which a substance may be dissolved in a liquid to form a solution.
Specific gravity	Density of a liquid or batter compared to density of water.
Staling	Refers to the drying out of freshly baked goods over a period of time. Starch crystallisation over time contributes to a dry eating character that is no longer perceived as fresh.
Starch	Starches are carbohydrates and are derived from plant sources. Starch is the major component of wheat flour, being present to the extent of 70% in bakers' flour. The starch molecules are large and consist of straight and branched chains of glucose units. There are two kinds of molecules in natural starches-amylose (straight chain) and amylo-pectin (branched chain). When they are acted on by alpha amylase dextrins are formed and when by beta amylase the fermentable sugar maltose is formed.
Steam	Water in the vapour phase at boiling point (100°C).
Steam, superheated	Steam at a temperature higher than the saturation temperature corresponding to the pressure.

Common words	Description
Steam, wet saturated	Steam at the saturation temperature corresponding to the pressure and containing water particles in suspension.
Sucrose	(see Sugar, cane)
Sugar, beet	Sugar derived from beet; identical to cane sugar.
Sugar, cane	Sugar derived from sugar cane.
Sugar, invert	Sugar of an equal mixture of glucose and fructose resulting from the hydrolysis of sucrose.
Temperature	The measure on a scale (°C) of heat intensity.
Temperature, room	Temperature of any room as, for example, a dough room for the purpose of calculating dough temperature or a room being conditioned for the comfort of occupants.
Texture	The feel of the crumb of a baked product. A good texture is one which is soft, yet resilient and elastic; however, grain properly refers to the size and shape of gas cells and texture refers to the feel of the crumb.
Thermometer	Instrument for measuring temperature.
Tin crust	That part of the crust that has come in direct contact with the tin during baking.
Top crust	That part of the crust above the tin and above the break
Viscosity	The resistance to flow. Thus a dough of 60% absorption will have higher viscosity than a dough made from the same ingredients at 64% absorption.
Vitamins	Substances required in animal and human diets in very small amounts for the normal and proper functioning of the body.

Common words	Description
Water in oil – see Emulsifiers	A term to describe the dispersion of water in oil where the proportion of oil exceeds the proportion of water and in which the oil is the continuous phase.
Yeast	A single-cell microorganism used in bread making which is capable of fermenting certain sugars to produce carbon dioxide and alcohol.
Yeast, active dry (ADY)	Yeast having a low moisture content and extended shelf life but having a lower activity than compressed yeast. Must be rehydrated before use.
Yeast, compressed	Fresh yeast having a firm consistency and formed into a block. Requires refrigeration but can be added directly to the dough.
Yeast, cream	Fresh yeast in liquid form. Primarily used by plant bakeries and stored in large refrigerated stainless steel tanks. Normally added directly to the dough via metering equipment.
Yeast, high activity instant dry (HADY)	Yeast having a low moisture content and extended shelf life. Can be added directly to the dough without hydrating.
Yeast food (see Bread improver)	Refers to all the substances necessary to support the growth of the yeast cell.
Yeast, protected active dry (PADY)	Yeast having a low moisture content and extended shelf life, similar to ADY but does not have to be hydrated before use. Not as active as HADY.
Zymase	A collective name for the group of enzymes in yeast that convert sugar to alcohol, carbon dioxide and water.

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