

# Student workbook

## Sponge cakes

Unit code: FBPRBK3008

Unit name: Produce sponge cake 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 FBPRBK3008 Produce sponge cake 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:

- How to prepare your work areas and yourself for work.
- How to read recipes and demonstrate a range of hand and machine skills to make sponge products.
- How to identify a range of bakery ingredients and products.
- The roles that the ingredients play in making basic sponge products.

- How to safely use bakery equipment and hygienically produce basic sponge products.
- How to mix, process and bake basic sponge products.
- How to package and store basic sponge products.
- How to pack up and clean up after bakery work.

## Topics

There are eight 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 7	Quality and faults
Topic 8	Pack up and clean 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:

- Measure sponge ingredient quantities to meet recipe specifications.
- Checking sponge products to identify faults and rectify.
- Maintaining records for baking sponge products.

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

If the product made doesn't 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 when making sponge products.

This doesn't need to be complex or difficult. It may be as simple as visually inspecting the batter while it is mixing to make sure it meets the product requirements, or that you have prepared your tins and trays, and used the correct timing and temperatures. You can then make adjustments, such as changing speed or timing on a mixer or making a change to the yield or ingredients.

Inspections and corrective actions are vitally important during all process of creating sponge products. You will learn to recognise faults 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 doesn't meet expectations, you will need to record it on the production schedule (you will find an example in Topic 1) 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

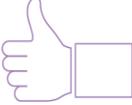
You will need to know the product types and volume that you will be producing. This is called the production schedule, and there is an example included in this workbook.

The production schedule may include the following:

- Date and day
- Person making the batch of products
- Baking parameters and time
- Yield
- Storage requirements
- Variations to formulations
- Outcome/quality
- Time of production

## Icon legends

Icons	Descriptions
	<p><b>Practice activity</b></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><b>Collaboration</b></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><b>Self-check</b></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><b>Readings (required and suggested)</b></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><b>Video clip</b></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><b>Measure ingredient quantities to meet recipe, formula and production schedule specifications</b></p>
	<p><b>Check products to identify faults and rectify</b></p>
	<p><b>Maintain records</b></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
Have you considered food safety when setting up your workspace?	
Do you understand the measurements when following a recipe?	
Have you successfully adjusted a recipe to increase volume?	
Have you worked with baking equipment?	
Do you understand the term personal protective equipment?	
Have you used measuring and weighing equipment?	
Have you operated a mixer to combine ingredients?	
Have you checked that a mixture is well mixed?	
Have you worked with sponge batter?	
Have you used an oven and set the temperature?	
Have you checked your baking to identify faults?	
Have you unloaded an oven and cooled your baked item?	
Have you used creams, chocolate and icing to decorate cakes?	
Have you prepared and stored baked items?	
Have you cleaned equipment and your work area when finished baking?	

How good are you at...	Your rating
Have you disposed of waste after cooking?	
Have you completed any workplace records?	
Have you considered food safety when setting up your workspace?	
Do you understand the measurements when following a recipe?	

## Sponge product overview



Slice of cake by [chiasheng tai](#) under Unsplash licence

Sponges have been a standard product made by the Pastry cook for many years. They are best described as a light, soft cake, which is the result of whisking eggs and sugar with the addition of a soft flour. The addition of baking powder enables the sponge cake to rise higher than traditional cakes.

The common ingredients of a sponge cake include eggs, sugar and soft flour. Whilst a true sponge does not have any fat added (it relies on the fat from egg yolks), a Genoise sponge requires the addition of clarified butter to enrich the batter, and the chiffon sponge is achieved by adding oil to give a moist and tender texture.

Batters can be mixed by using either scratch mix ingredients, with or without the addition of emulsifier, or by using a pre-mix.

By slightly altering the ingredients, mixing method, production process, finishing and decorating processes there are an abundance of beautiful sponge variations.

This table provides a summary of some of the variations at different stages of the sponge making process.

Ingredient	Mixing	Production	Finishing
Scratch mix	Warm foaming	Spreading	Masking and combing
Scratch mix with emulsifier	Cold foaming	Rolling	Splitting and filling
Pre-mix	Other foaming	Layering	Piping
Scratch mix	Emulsifier	Depositing	Creaming
	Ladyfinger		Garnishing
	Othello		Layering finishes

The production and the finishing and decorating process is where the sponge is transformed. Accessorised with fillings and toppings that include creams, mousses, fruits, nuts, chocolate and fondant coatings the sponge can be altered to appeal to all tastes and occasions.

Popular sponge cakes include: Black forest cake, traditional jam and cream sponge sandwich, swiss roll, chiffon pandan cake (South East Asia), savoiardi biscuits, steamed sponge (Malay), tiramisu and chocolate yule log rolls.

**Tip:** Chiffon cakes are another popular sponge product. The Chiffon Cake is a hybrid of the Genoise sponge as it adds oil to the ingredients, instead of butter.

## Sponge making production process



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Process	Traditional	Stabilised	Genoise
<b>Mix</b>	<ul style="list-style-type: none"> <li>Scratch mix</li> </ul>	<ul style="list-style-type: none"> <li>Scratch mix with emulsifier</li> <li>Pre-mix sponge</li> </ul>	<ul style="list-style-type: none"> <li>Scratch mix</li> </ul>
<b>Common ingredients</b>	<ul style="list-style-type: none"> <li>Eggs</li> <li>Sugar</li> <li>Flour</li> <li>Optional: Baking Powder</li> </ul>	<ul style="list-style-type: none"> <li>Eggs</li> <li>Sugar</li> <li>Flour</li> <li>Milk</li> <li>Baking Powder</li> <li>Emulsifier</li> </ul>	<ul style="list-style-type: none"> <li>Eggs</li> <li>Sugar</li> <li>Flour</li> <li>Milk</li> <li>Baking Powder</li> <li>Addition of at least 4% added butter at end of processing</li> </ul>

Process	Traditional	Stabilised	Genoise
<b>Mix method</b>	<p><b>Cold foaming:</b> Eggs and sugar placed directly in the mixing bowl and whipped at high speed.</p> <p><b>Warm foaming:</b> Eggs and sugar are warmed to 43°C then placed in the mixing bowl and whipped at high speed.</p>	<p><b>All in method:</b> Liquids placed in the bowl first, then the dry ingredients and whipped on high speed 5 minutes and low speed 2 minutes.</p>	<p><b>Cold foaming:</b> Eggs and sugar placed directly in the mixing bowl and whipped at high speed.</p> <p><b>Warm foaming:</b> Eggs and sugar are warmed to 43°C then placed in the mixing bowl and whipped at high speed.</p> <p><i>At the end of processing the melted butter is added to the mix.</i></p>

Batter processing techniques:

- Depositing
- Spreading
- Rolling
- Layering

Finishing:

- Masking and combing
- Splitting and filling with jam, spreads, fresh fruit, creams and icings
- Garnishing with chocolate, dusted with icing sugar, cocoa powder, snow sugar

Popular products:

- Cream and jam sponge (Victoria)
- Piped into ladyfingers
- Moulded into madeleines
- The base of a Jaffa cakes
- Rolled into Swiss rolls

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 sponge products
- Preparing the work area to meet food safety and workplace health and safety requirements
- Protective equipment for working safely
- Formulas, Production Scheduling – techniques and considerations
- Types of sponge products

## The baking industry regulatory requirements

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, you should make sure that:

- You regularly clean surfaces, equipment and utensils
- Wash hands between tasks
- Clean up spills on the floor immediately
- Maintain high standards of personal Hygiene
- Store food items in the correct area when not in use

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)

In the workplace you have a responsibility to help prevent any potential accidents by taking all necessary care and following all safety instructions from your employer, or whilst attending college from your trainer. Report any safety hazard immediately, so corrective action can be taken. Sometimes the hazard may be removed quickly and without fuss, for example a spill of liquid can be mopped up straight away, removing the danger before a slippage can occur.

Other hazards to look out for:

- hot trays, tins and utensils
- knives submerged in washing-up water
- wet/damp oven gloves
- loose clothing/hair
- moving parts of machinery
- lack of machine guards
- lack of fire extinguisher
- cluttered work areas—aisles, benches etc.
- loose floor tiles/mats
- foot wear in bad condition
- dark corners or passageways
- greasy stairways, no handrails
- unattended fat fryers
- careless use of extension cords.

### Tip: Important safety regulation

The *Work Health and Safety Act 2011* duties of a worker - while at work a worker must:

- take reasonable care for their own health and safety
- take reasonable care for the health and safety of others
- comply with any reasonable instructions, policies and procedure given by their employer, business or controller of the workplace.

## Personal protective equipment (PPE)

It is very important that you know the personal protective equipment provided by workplace and that you use it, clean and maintain it and store it correctly. These items may include: non-slip footwear, hair/beard net, protective clothing and gloves. Protective equipment helps protect you and ensure hygiene is of a high standard.

## Formula balance

A formula is a group of ingredients in a recipe. The balance is whereby the amounts of those ingredients interact with each other to produce a cake without faults.

Before you calculate the amounts of ingredients to use in a recipe it is important that you have a good understanding of the functions of each ingredient and how they interact with each other during mixing and baking. Let's look at the example of a pound cake.

There are four basic ingredients necessary in the construction of a cake formula:

- flour
- fat
- eggs
- sugar

A basic cake can be successfully made using equal amounts of each of these four ingredients — this is known as a pound cake. Originating from the days of imperial weights when a cake was made from a pound of each of the four ingredients:

- a pound of flour
- a pound of fat
- a pound of egg
- a pound of sugar



## Maintain records

### Production schedule

A production schedule is an important document that tells you what work needs to be completed and how it is to be done. It should be the first and the last task of the day. During this unit, you will need to complete production schedules to record your work. You will need to start a production schedule before you start work in the bakery, to plan out what you will be baking, and record your results when you are done.

A production schedule will include the following:

- Product processing requirements, such as what needs to be produced and in what timeframe
- Volume and processing requirements
- Recipe reformulation to minimise waste
- Finishing parameters for sponge cake products
- Bake parameters for sponge cake products
- The person who made the batch of products

At the end of your work, you record anything on the production schedule that may have happened differently than you had planned. This may include the amount of bakery items produced may have been different than expected, 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			



## Practice activity

### Activity 1.1: Production schedules

Research production schedules used in your bakery (in the workplace or on TAFE campus). Answer the following questions.

1. What is the purpose of the production schedule?

2. Why would the manager of a bakery rely on the production schedule?

3. What corrective measures can be implemented from the production schedule?



## Practice activity

### Activity 1.2: Case study

Read the following case study: [Wholesale Bakery Hygiene Case Study](#). Answer the following questions:

1. What are some of the potential risks to public health from both customers and staff working in the bakery?

2. Explain what is a penalty notice and the implications of the penalty notices referred to in the case study?

3. Do you think the penalties and actions of the NSW Food Authority were appropriate? Explain.



## Video clip

### Activity 1.3: Bakery work video

Watch any part of the following video: <http://www.youtube.com/watch?v=iUuKstAWof4>  
(you do not need to watch the whole video, your teacher can confirm the area of focus).



Break into pairs and identify at least three possible safety issues from the video. Imagine your partner is a new staff member in your workplace. Explain to your partner the potential risk and the safe use of the equipment or tasks in your bakery.



## Self-check questions

### Activity 1.4: Short answer

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

1. A customer has requested the pre-order of a specific product for an upcoming birthday. You do not produce this particular product in your bakery. What should you do?

2. When might you be required to alter the recipe (formula) in your workplace? What general rules would you follow to create your new formula?

Topic 2

# Equipment



## Topic 2: Equipment

In this topic you will learn about the equipment used to bake sponge products.

- Basic equipment
  - Industrial mixer and attachments
  - Ovens
  - Heat Transfer
    - Radiation
    - Conduction
    - Convection
- Preparation of trays

Bakeries are busy workplaces and it is important to prepare yourself and your workspace at the start of your work day. 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, maintenance and reporting equipment malfunctions.

Here is a list of equipment used to produce sponge products:

Equipment	Equipment accessories	Tools and utensils	Ancillary equipment
Industrial oven	Whisk	Pallet knives	Sponge baking trays
Industrial mixer and attachments	Sink, taps and accessories	Piping bags	Sponge tins
Hand washing sinks	Industrial oven decks and accessories	Piping nozzles	Cupcake tins
		Plastic scrapers	Ingredient storage containers
		Icing sieves	
		Measuring jugs	
		Mixing bowls	
		Paintbrushes	
		Spatula	
		Cooks knife	

## Basic Equipment

### Mixers

The most commonly used types of mixer for producing sponge batters are Planetary mixer using a whisk.

To avoid 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.
- 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 for assistance from your trainer.
- Use the mixer according to manufacturer's recommendations.

## Industrial oven

The parts of the oven are as follows:

Part	Explanation
Thermostat	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.
Damper (flue)	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.
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 should attend the oven at a time.
- If baking a small load (e.g. 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.
- If the products are baking unevenly you may need to turn the tray during baking.
- Space products evenly on the tray for uniform baking.
- Never use wet or badly worn oven gloves/mitts to handle hot trays.
- Avoid having to walk too far with a hot tray where possible. Position a rack beside the oven for hot trays.

## Heat transfer

As a baker we know that ovens generate heat, it is this transfer of heat from one object to another (from source to food) which enables products to be baked in the oven. When we understand how this occurs we can control the cooking and baking process with greater success. We can then also monitor the quality of the products we produce.

During the baking process heat can be transferred from the source to the food by three main ways. These are radiation, conduction and convection; most methods of cooking and baking rely on more than one means of heat transfer.

### Radiation

Radiation is a form of indirect heat; the heat travels through space from a warmer object to the cooler surface of the food. When you think about radiant heat think about a hot pot, when you place your hand near the pot, but not on the pot, you can feel the heat being given off. That's why we call it radiant heat, the heat radiates outwards from the source.

Other examples of radiant heat are toasters, infra-red lamps and conventional ovens. The heat from the sun travelling to earth is another also an example of radiant heat.

Black or dark coloured trays will radiate a greater amount of heat from their surface than lighter coloured trays; this is because the dark surface absorbs more heat energy to begin with. The dull black tray at work will radiate more heat than a shiny new black tray, in other words they will bake the product faster than the newer tray.

However, if sheet pans or trays are marked with blackened baked on food they radiate heat unevenly... that's why we keep our trays scraped and clean!

If radiant heat travels and is absorbed by the surface of the food only, how does heat penetrate beyond the surface? Heat penetration within the baked product occurs through conduction and convection.

## Conduction

When heat travels by direct contact from the source of the heat to a cooler area, we describe this as “conduction”. A good example of this in the bakery would be the heat travelling from the sole of the oven to the cool baking tray when it is placed in the oven.

Think also about a tray of cookies in the oven. It is first heated by radiant energy; once the tray and the surface of the cookies are hot the heat is then conducted through the tray and then the cookies.

The difference between radiant heat and conduction is:

- Radiant heat transfers energy quickly.
- Conduction transfers energy slower.

How well heat conduction can occur is also influenced by the type of material through which the heat is conducted. For example, a copper pot will conduct heat faster than a stainless steel pot.

The conductivity of different metals and the advantages and disadvantages:

Type of metal	Conductivity	Advantages	Disadvantages
<b>Copper</b>	Very high.	Enables substances to reach high temperature quickly.	Expensive. Can react with certain types of foods. Can be toxic at high levels.
<b>Aluminium</b>	Conducts heat only half as efficiently as copper.	Low cost inexpensive. Anodized aluminium is hard and durable, non-reactive with food and easy to clean. Anodized aluminium comes as thick gauge and will conduct heat more evenly than thin aluminium gauge.	Reacts with acidic food. Aluminium is a soft metal that can be easily scratched and marked.

Type of metal	Conductivity	Advantages	Disadvantages
<b>Stainless Steel</b>	Not a good conductor unless it contains an aluminium core (found normally in pots).	Durable long lasting. Does not react with food. Moderately priced. Has a light reflective, non-reactive surface which enables viewing of food easier.	Thin gauge stainless steel cook ware does not conduct heat evenly resulting in hot spots.
<b>Cast iron</b>	Reasonable conductor of heat.	Due to its black colour can also transfer heat through radiation.	Reacts with some foods resulting in a metallic taste.  Can discolour food and is really used in a bakery environment.
<b>Tin</b>	Good conductor.	Light weight. Inexpensive.	Rusts easily.  Darkens with acidic foods.

## Convection

Convection can be described as heat transferred through liquids and gases; this involves the constant movement of cold currents of air or liquids toward warmer currents.

A convection oven will work faster than a conventional oven because the hot air is forced across the surface of the products pushing the cooler air away. The hot air is forced to rise and the cooler air sinks. A convection oven uses a fan to circulate the air, other ovens like the Rotel and Reel ovens work by moving product through the air.

Water has low heat conductivity, this means it is slow to conduct heat; this is why we bake some products such as cheesecakes and custards in a water bath.

When baking in a convection oven the general rule is to lower the temperature by 15-20°C and reduce the baking time by about 25%. Ensuring the oven is not overloaded and allowing a gap between baking tins or pans, will allow for movement of the hot air to circulate unobstructed.

It is important when using a convection oven to minimise the number of times you open the oven door. Each time the door is opened the oven's warm convection currents flow out into the bakery!

## Checking equipment

Before you commence work you need to know about all the equipment that you will use, how to check it is safe and clean for use, how to operate it safely and efficiently, and how to clean it safely. You will also need to know how to record information at your workplace about using the equipment, cleaning schedules and reporting anything about the equipment you are using, such as when it is not working properly.

Before you start operating equipment make sure that you have read the standard operating procedure (SOP) which are instructions on how to operate the equipment safely.

## Preparation of the cake tins and hoops

Tins and hoops are normally prepared by spraying, papering or lining with silicone mats.

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 sponge cakes.

The reasons for papering the trays are:

- The paper helps to insulate the sponge batter during baking.
- Minimises the risk of damaging the product by allowing easy removal from the tin.
- Improved hygiene – sponge cake can be handled without direct human contact.



## Practice activity

### Activity 2.1: Equipment in your workplace

Research the equipment used in your workplace bakery. Briefly describe the brand, type and an overview of how it works differently to other types. An example has been provided for you.

Equipment	Brand or type	Features
<i>Oven</i>	<i>Bonnet Combi - Electric</i>	<i>10 tray oven, front and side load, 80 pre-set recipes.</i>



## Collaboration

### Activity 2.2: Case study

Read the case study here: [Injury prevention and management case study](#). Break into pairs.

1. Discuss with your partner a particular piece of equipment from your workplace that you think could be improved by implementing one of the safety controls mentioned in the case study (Refer to the [hierarchy of risk control](#) for more information).

2. Discuss with your partner a particular piece of equipment from your workplace that you think could be improved by implementing one of the safety controls mentioned in the case study (Refer to the hierarchy of risk control for more information).



## Self-check questions

### Activity 2.3: Equipment

Read the questions carefully.

1. Why is it important to always make sure the mixing bowls, trays and other mixing equipment is clean before use?

2. List two reasons for the importance of lining cake tins or trays with baking paper?

3. List at least three pieces of equipment in your workplace that require external maintenance.

Topic 3

# Ingredients



## Topic 3: Ingredients

This topic explores the ingredients used to make sponge products. You will learn both practical skills and knowledge on the following:

Ingredients used to make sponge, inclusive of:

- Basic ingredients
- Detailed ingredients

Working in the baking industry, you will be required to identify the ingredients that are commonly used, without necessarily referring to the print on the packaging or identification labels on bins or canisters.

With more experience working in the industry you will develop an understanding of a vast range of ingredients and be able to use your body's senses to identify the ingredients, sometimes by sight alone, other times with the help of touch, smell and taste.

It is a good idea for you to develop these senses by using them to identify each ingredient as you are using it. Don't be afraid to sample-taste, smell or touch the ingredients you are using, as it is only from regular handling of them that you will develop a good knowledge and understanding of them.

### Basic ingredients of sponge dominant components

#### Eggs

In any sponge formula, the weight of the eggs is always used as the basis for determining the quantity of the remaining ingredients. Whole eggs, entirely or in part, may be replaced with egg yolks or egg whites. Increasing the amount of egg whites produces a lighter sponge with a larger pore structure. More egg yolks will result in a denser sponge with finer pores. Increasing the yolk content in an already heavy sponge cake can have a detrimental effect. The yolks will reduce the available water content, making it difficult for all of the sugar to dissolve.

The eggs should be shelled as close as possible to the time of making the sponge. Eggs that have been shelled and left overnight should not be used for sponges. Both egg whites and egg yolks are available in pasteurised form, ready to use and packaged in convenient refrigerator cartons (like the type milk and juice come in). These are becoming increasingly popular in the industry, not only from the health and sanitation standpoint, but also because they are so efficient to use, reducing labour, spoilage and breakage.

Fresh eggs are generally used to give best results in a conventional sponge. Egg pulp is used mainly for stabilised sponge.

## Sugar

Granulated sugar or, even better, the finer grade castor sugar, should always be used in a sponge cake to ensure that the sugar dissolves easily. The proper amount in relation to the other ingredients is also important, as discussed previously. Too little sugar, in addition to affecting the taste and colour, can make the cake tough by throwing the formula off balance; in actuality, you now have too much flour. This condition will also cause the crust to darken unfavourably and give the sponge a dense texture.

## Flour

The flour used in a sponge cake must have a good ratio between starch and protein. Some gluten (a high percentage of which is found in bread flour, for instance) is necessary to bind and hold the structure, but too high a percentage makes the batter rubbery and hard to work with and results in a tough and chewy sponge. A flour with too much starch, such as cake flour, will produce a light and tender sponge, but the structure will collapse partially when baked. It is best to adjust this ratio yourself in individual recipes by combining both bread and cake flours in the proper proportions, as opposed to using premixed all-purpose flour.

Pure starches such as potato starch and corn-starch can be used to weaken the gluten, but no more than half of the weight of the flour should be replaced. Cocoa powder, which also does not contain any gluten, is usually added for flavour rather than as a means to reduce the gluten strength.

Flour for sponge cakes should always be sifted. If you use unsweetened cocoa powder or any other dry ingredient, sift it in with the flour. When adding the flour to the batter you must be very careful not to break the air bubbles that you just whipped in. Fold in the flour with a rubber spatula or your hand and turn the mixing bowl slowly with your other hand at the same time to combine the ingredients evenly. Never stir the flour into the batter or add it with the mixer.

## Butter

Butter is added to a sponge cake, not only for flavour, but to improve the quality of the finished sponge. The cake will have a finer pore structure as the batter becomes heavier. Butter also extends shelf life.

Butter can be added to a sponge in an amount up to  $\frac{2}{3}$  the weight of the sugar. The butter should be melted but not hot. It is always added last, after the flour has been completely incorporated, otherwise the butter will surround any small lumps of flour and you won't be able to break them up without losing volume.

## Baking powder

This is used for additional aeration; its effects are for opening the texture batter and provided crust colour. Sieve with flour.

## Glycerine

Glycerine improves shelf life of sponges and cakes, etc. It attracts moisture therefore keeping the sponges, etc. 'fresh'.

## Detailed ingredient list

### Flour

The majority of flour that we use for making bakery products is milled from wheat. The wheat grain is made up of three basic parts:

- Bran
- Germ
- Endosperm

Wholemeal flour is milled from the whole berry (containing bran, germ and endosperm) and as you will see it has a light brown colour to it, caused by the bran.

White flours are milled from the endosperm (the centre of the wheat grain).

Wheaten flour is available in various grades (often identified by the flour millers by product brand names) so that you can produce a range of different bakery products. The various grades of flour have different characteristics, but each are of good quality.

The grade of flour is determined by the quality and quantity of gluten proteins in the flour. Gluten protein is found only in the part of the wheat grain known as the endosperm.

The approximate composition of white flours:

White flours	Composition
Carbohydrates (starch and sugar)	73-74%
Moisture	13-14%
Gluten proteins	7-14%
Cellulose	0.2-0.4%
Fats/oils	0.6-0.8%

Some examples of different grades of flour, with average gluten protein content, are shown in the table below:

Grade of flour	Average gluten forming protein content
Hi ratio/sponge flour	8.0%
Soft flour	8.0%
Medium flour	9.0%
Bakers flour	11.5%
Hi protein flour	13%

How is Hi ratio/sponge flour different to soft flour? Hi ratio flour has been:

- milled finer
- treated with chlorine gas.

The finer particles of flour will absorb more moisture. The chlorine gas changes the gluten proteins so that they will not develop when mixed with water. Chlorination also lowers the pH of the flour; therefore, it will gelatinise at a lower temperature.

Soft flour has a low gluten protein content. It has not been milled finer or treated with chlorine gas to change the gluten.

Some examples of the uses of the different flour grades are:

Flour grade	Uses
Hi ratio/sponge flour	Hi ratio cake, sponges, block cakes
Soft flour	Biscuits, short pastry, conventional block cake, conventional sponges
Medium flour	Fruit cake, short pastry, biscuits
Bakers flour	Puff pastry, bread, buns, scones, rock cakes, Danish pastries
Hi protein flour	Bread, buns

**Storage:** Store in a cool, dry, well-ventilated location.

### Flour most suitable for sponge making

The grades of flour most commonly used for making sponges are:

Flour grade	Description
Soft flour	<p>Soft flour contains approximately 8% gluten protein. As a result of the low gluten content it minimises the development of gluten during mixing and helps to produce a more tender eating sponge.</p> <p>Note: If a soft flour is not available it may be substituted with a blend of medium/strong flour with cornflour (cornflour does not contain gluten).</p>
Hi ratio flour	<p>Hi ratio flour contains approximately 8% gluten. It is also milled finer and chlorinated to denature the gluten. Most suitable for sponges with a high moisture content. The finer flour particles help to absorb the high moisture content and the chlorination of the flour prevents the gluten from forming during mixing. It also helps the starch to gelatinise at a lower baking temperature. This flour was originally developed for the production of Hi ratio cakes but has since been used for making a range of other cakes, sponges and pastries which require a low gluten content.</p>

Flour grade	Description
Self-raising flour	Self-raising flour is plain flour with baking powder added and is purchased readymade. It contains approximately 94% flour with 6% baking powder. It is unlikely that you will be required to use self-raising flour in a bakery, as most baker/pastry cooks prefer to weigh their baking powder separately, in amounts that will vary from product to product. Self-raising flour is usually used for domestic baking.
Plain Flour	Plain or all purpose flour is used for general baking. It contains 75% of the wheat grain. Plain flour is usually used for domestic baking.

## Fats and oils

The types of fats and oils used in sponge, cake and cookie products are:

- Butter – salted, unsalted
- Margarines – cake
- Shortenings – cake, cream
- Oils (vegetable) – canola, peanut, olive, safflower

## Butter

Butter is a natural product made by churning milk – it is the natural fat component of milk. Butter is available as salted or unsalted and has physical properties similar to cake margarine. Butter has a low melting point and will melt quickly if it is left in a hot bakery for too long. For storage it is best kept in the refrigerator.

## Margarines

Margarines are human made by mixing refined fats and oils with water, salt, milk solids, flavours and colours. During manufacture margarines need to be chilled under controlled conditions to give it the desired texture and performance.

## Shortenings

Shortenings are human made by mixing refined fats and oils with flavours, colours and emulsifiers. During manufacture shortenings need to be chilled under controlled conditions to give a desired texture and performance. Shortenings do not contain water.

### Cake margarines and cake shortenings

Cake margarines and cake shortenings are made using soft fats with a low melting point. They contain a fairly high proportion of liquid fats in relation to solid fats. They are designed to entrap air during mixing and must be able to form a stable emulsion.

### Cream shortening

Cream shortening is a soft fat with very good mechanical aerating properties. It is able to produce a stable emulsion. Cream shortening contains fats/oils that have a low melting point and produce mock creams that are less greasy on the palette.

### Special cake shortenings (Hi ratio shortenings)

Hydrogenated shortenings are designed for the production of High ratio cake. They have excellent emulsifying properties and very good mechanical aeration properties.

**Storage:** Store butter between 1°C and 5°C. Store margarines, shortenings and oils in a cool dry location away from ultraviolet light.

The functions of fats in genoise sponge products:

- Fat helps to produce a shorter eating product.
- Fat helps to improve the keeping qualities (moisture retention).
- Fat adds to the flavour of the product.
- When fat is added to a sponge batter the baked sponge will have a fine, close texture.
- If the fat being used is coloured (yellow), this will help to produce a creamy coloured crumb in the product.

## Oils

Oils provide the fat substance for making sponge cakes. They are liquid at normal temperature and can be mixed with butter when baking. Vegetable oils are the most commonly used oils used in baking, these include sunflower, olive, cotton-seed, and nuts. Most vegetable oils are low in cholesterol.

Refined vegetable oils are the most suitable for heating to high temperatures as they have the highest smoke point and can withstand high temperatures. They are also the best for baking.

Note: Palm oil has gained a lot of negativity due to unsustainable practices. Care should be taken to source ethically harvested and produced products.

## Sugars

Sugar is a carbohydrate. Types of sugars used in sponge, cake and cookie products:

Crystal	Liquid
1A – courser grade	Molasses
Caster	Treacle
Raw	Glucose
Brown	Malt
XD	Honey
Icing—pure/ mixture	Golden syrup
Snow sugar	-

Sugars most suitable for making cakes and sponges.

### Caster sugar

Caster sugar is a fine white crystal used in most sponge and cake batters. The fine crystal dissolves easily in the moisture content of the batter.

## Brown sugar

Brown sugar is a moist, brown coloured crystal containing syrups. It is used in dark fruit cakes and spice flavoured cakes. The colour of the sugar helps to colour the cake and the syrup flavour of the sugar helps to add to the overall flavour of the cake.

## Liquid sugars

Liquid sugars, such as honey and golden syrup, are sometimes used either as a substitute for, or in addition to, crystal sugars in some dark fruit cakes and spice flavoured cakes.

Liquid sugars contain approximately 25% water, which must be allowed for when substituting them for crystal sugars. Honey is an invert sugar, which will caramelize at lower temperatures than crystal sugars and, therefore, requires a lower baking temperature.

## Snow sugar

Snow sugar is a non-melting powdery white sugar similar looking to icing sugar. It is popular as it does not melt in baked goods, and it will not dissolve when sponge cakes have been refrigerated.

It is made from palm oil, dextrose, vegetable oil and wheat starch. It is great when serving sponge cakes in humid areas or when sponge products are stored for extended periods.

## Rapadura sugar

This type of sugar is popular with the production of organic products. It has a caramel flavour, sweet aroma and is rich golden in colour (this can depend on the soil type).

It is a certified organic sugar cane, grown and processed without the use of any artificial additives. It is made by extracting the pure juice from sugar cane by use of a press. It is then heated at a low heat to evaporate the water and then ground to a fine texture. The molasses has not been separated from the sugar and does not contain any chemicals or anti caking agents.

The functions of sugars in sponge making:

- Sugar sweetens the cake/sponge.
- Sugar caramelises during baking to produce a golden brown crust colour.
- When crystal sugar is whisked with eggs or beaten with fats it helps to entrap air bubbles.
- Sugar helps to improve the keeping qualities of the cake/sponge (sugar is hygroscopic – able to attract moisture to itself).
- Sugar produces a softer crumb in the cake/sponge.

- Dusting techniques using Icing and snow sugar can be used to improve visual appeal.

**Storage:** Store in a cool, dry, well-ventilated location.

## Eggs

The domestic hen egg is made up of approximately:

- 75% water
- 12% protein
- 11% fats
- minerals and vitamins.

The egg is made up of three parts:

Part	Components
Shell – 11% of the total weight	Calcium Phosphate
Yolk – 31% of the total weight	Water – 51% Fat – 30.5% Protein – 16% Some minerals
White – 58% of the total weight	Water – 88% Protein – 9% Some minerals

Eggs are available in various forms:

- fresh shell eggs (store between 1 ° C and 5 ° C)
- frozen pulp (store at minus 18 ° C)
- fresh, liquid pulp (store between 1 ° C and 5 ° C)
- dried/dehydrated (store in a cool, dry, well-ventilated location)

### Fresh shell eggs versus egg pulp

There are many advantages and disadvantages of using shell eggs and egg pulp. They are:

- Liquid egg pulp is conveniently dispensed from its 'bladder'/container.

- Fresh eggs have superior aerating properties.
- Egg pulp (frozen) is conveniently stored at minus - 18°C, for up to 6 months.
- Once thawed, egg pulp, must be kept refrigerated (between 0°C and 5°C) and used within 3 or 4 days.
- Fresh eggs can be separated into yolks and whites.

### The function of eggs in sponge

- Eggs improve the food value of the sponge cake product.
- When eggs are whisked they entrap air bubbles which will aerate the sponge cake product.
- The water content of eggs will help to bind dry ingredients together.
- The protein content of egg will set during baking, helping to provide the structure of the cake/sponge/cookie product.
- Eggs help to improve the crust colour of sponge cake products.
- Due to the powers of emulsification of eggs, they improve the keeping qualities of cake and sponge products.
- The natural yellow colour of eggs helps to improve the crumb colour of sponge cake products.
- Eggs add flavour.

## Milk

Milk is available in various forms:

- Liquid
  - Fresh pasteurised full cream (homogenised)
  - Fresh pasteurised skimmed milk
  - Evaporated milk—condensed milk (sweetened and unsweetened)
- Butter milk
  - Powdered
  - Full cream milk powder
  - Skim milk powder

## Pasteurisation of milk

All liquid milks are heat treated (pasteurised) to destroy pathogenic bacteria in the milk. The milk is heated to 72°C, held at that temperature for 15 seconds and then it is cooled to below 4.5°C.

## Homogenisation of milk

Some liquid milks are homogenised, a process by which the butterfat particles in the milk are physically reduced in size to mix more evenly with the water component of the milk (this produces a more stable emulsion).

## Milk powder

There are two types of milk powder:

1. full cream milk powder
2. skim milk powder.

Skim milk powder differs from full cream milk powder in that skim milk powder has a lower butterfat content (refer to the following table).

Constituents	Full cream, milk powder	Skim milk powder
Water	2.5%	2.0%
Butterfat	28.2%	0.8%
Casein and albumen (protein)	26.6%	36.7%
Lactose (milk sugar)	36.8%	51.1%
Ash	5.9%	9.4%

Making liquid milk from milk powder (reconstituting milk powder):

- Mix the milk powder with water at the ratio of 1 part milk powder to 10 parts water (10% milk powder) or as recommended by the manufacturer.
- Place cold water into a bowl/bucket, sprinkle the milk powder on top of the water and then whisk rapidly to mix together.

**Storage:** Store fresh and reconstituted milk between 1°C and 5°C. Store milk powders in a cool, dry, well-ventilated location.

## Chemical aeration

### Baking powder

Baking powder is made up of:

- 2 parts acid, 1 part alkali (2:1 ratio)
  - an acid (acid sodium pyrophosphate)
  - an alkali (sodium bi-carbonate)
  - a neutral agent (flour or starch)

**Tip:** Baking powder needs heat and moisture to react.

Baking powder is a mixed blend of food acids (of which there are several types) and bi-carbonate of soda with starch is 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 neutralise each other.

The baking powder is normally added with the flour and mixed through the batter, which is then placed in tins or on trays then baked.

With the presence of water from the batter and the heat of the oven, the acid acts upon the alkali to release a gas known as carbon dioxide. The carbon dioxide gas is entrapped in the batter and causes it to rise. The carbon dioxide also helps to produce what we know as the texture of the cake, sponge or cookie (the cellular structure).

The function of the neutral agent (flour/starch) in the baking powder is to help minimise any reaction between the chemicals prior to adding to the batter.

Gluten free baking powder is available when working with gluten-free products.

**Storage:** Store baking powder in a sealed container, in a cool, dry, well-ventilated location.

### Bi-carbonate of soda (also known as baking soda)

Bi-carbonate of soda is used as a chemical aerator in some cakes, such as gingerbread, honey roll and sticky date puddings.

During the baking of the sponge, the bi-carbonate of soda will react with the natural acidity of the batter and give off carbon dioxide gas. Because there is not enough acid in the batter to neutralise all of the baking soda it leaves a residue of sodium carbonate (common washing soda). The soapy flavour left in the cake needs to be camouflaged with strong flavours such as from the addition of spices to the batter.

The sodium carbonate is strongly alkaline and attacks both starch and sugar, particularly invert sugar, dehydrating the carbohydrates and leaving behind complex carbon compounds which are brown in colour, hence producing a dark coloured crumb.

In some recipes you will find that bi-carbonate of soda is used as well as baking powder, mainly to give a darker colour to the crumb. An example of this is the use of bi-carbonate of soda, as well as baking powder, in a batter for a honey roll. The bi-carbonate of soda gives a darker and richer coloured crumb.

**Storage:** Store bi-carbonate of soda in a sealed container and place container in a cool, dry, well-ventilated location.

## Glycerine

Glycerine is a clear liquid which appears similar to sugar syrup. Even though glycerine is sweet to taste it is not a sugar and is derived from fat.

Glycerine is a hygroscopic ingredient, added to cake and sponge batters to help improve the keeping qualities of the baked product.

Some major cake manufacturers spray cakes prior to packaging with glycerine solution to assist with moisture retention.

**Storage:** Store glycerine in a cool, dry, well-ventilated location.

## Sponge emulsifier/stabiliser

These are available in either paste or powder form.

Function of sponge emulsifiers/stabilisers:

- To help mechanically aerate the batter (the stabiliser contains a foaming agent).
- To help thicken the batter and retain the entrapped air bubbles.
- To help produce a stable emulsion, to help combine ingredients.
- To enable egg to be substituted with water.

## Cocoa powder

Cocoa powder is milled from the cocoa bean. It is added to cake and sponge batters to flavour the product chocolate. Cocoa powder is available in various qualities. The quality of cocoa powder is mainly determined by the level of cocoa butter that it contains. The higher the level of cocoa butter the richer the flavour.

## Dutch cocoa

A type of cocoa known as Dutch cocoa is available to the food industry. This type of cocoa has been treated with an alkaline substance to help produce a cocoa which has:

- a richer, less bitter flavour
- a richer and darker colour.

Plain cake batters may be converted into chocolate cakes by the addition of cocoa powder. Cocoa powder will produce a dry crumb; therefore, you need to add additional water or milk to the batter. The cocoa powder and extra water/milk will close the crumb, therefore you will need to add extra baking powder to open the texture and produce the desired volume.

To do this successfully use the following guidelines:

- Substitute approximately 10% to 20% of the flour weight with cocoa powder.
- Add extra water/milk equivalent to the weight of the cocoa.
- Add extra baking powder to help open the texture and increase the volume.

Example: A recipe containing 1000g (1kg) of flour can be adjusted as follows:

Ingredient	Measurement
Flour	800g
Cocoa	200g
Milk	200g (equal to the weight of the cocoa)
Baking powder	10g

As an alternative to using cocoa to produce a chocolate sponge batter you may add a commercial chocolate paste to the batter.

The chocolate paste contains cocoa, flavours and colours, and may be added to the batter at the beginning of the mixing procedure or after the batter has been mixed and is ready to be deposited. Make sure that the paste is evenly mixed through the batter to avoid streaks in the baked sponge.

When using chocolate paste there is no need to adjust the recipe, therefore the plain batter may be used to produce varieties other than chocolate cake. The remaining batter can be flavoured with the chocolate paste to produce chocolate cakes/sponge.

Add the paste in the dosage recommended by the manufacturer.

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

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. Be careful not to overheat the eggs, as they will start to cook (coagulate).

## 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 do 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<sup>1</sup>. 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. Students are encouraged to research the website and refer to the Allergen Cards.

The link to the site is: <https://allergyfacts.org.au/allergy-anaphylaxis/food-allergens>



## Practice activity

### Activity 3.1: Research in your workplace

Research the ingredients and stock processes within your workplace. Answer the following questions.

1. What stock rotation process do they follow?

2. How do staff in your workplace know what ingredients are expiring and when they should be used?

3. How does your workplace store ingredients to extend shelf life?



## Collaboration

### Activity 3.2: Food identification challenges

1. To determine your ability to identify bakery ingredients, ask your trainer to supply a range of the commonly used items. Have them placed in containers without labels and use your senses to identify them. Do this as often as time permits, until you are able to identify all ingredients being used in your place of employment or the TAFE bakery. Examples of commonly used items include chocolate varieties, flours, sugar and varying nuts.

Foods you were unable to determine and may need to practice:

2. Work in teams to complete the following chart. Research the following food ingredients and locate a substitute product that could be used.

Ingredient	Substitute ingredient
Milk	
Fresh shell egg	
Caster sugar	
Baking powder	
Baker's flour	
Chocolate chips	
Cocoa powder	



## Self-check questions

### Activity 3.3: Check your knowledge

Read the questions carefully.

1. List two reasons for pre-conditioning the ingredients when making a conventional sponge using the warm foaming method.

2. When weighing all sponge ingredients prior to mixing, what important step (with the scales) should be carried out to ensure accuracy between adding each new ingredient?

3. What is a sponge stabiliser?

4. Why is it important to sieve dry ingredients through a fine sieve?

5. What is the purpose of baking powder when producing sponge products?

6. What is the common flour to use when making sponge products?

7. Name at least one organic sugar used in baking.

Topic 4

# Mixing and processing techniques



## Topic 4: Mixing and processing techniques

This topic discusses how you mix and process sponge cake batter to correctly produce the required bakery product.

You will learn both practical skills and knowledge on the following:

- Mixing methods
  - Emulsified method
  - Warm foaming method
  - Cold foaming method
  - Other foaming method
  - Ladyfinger method
  - Othello method
- Aeration
  - Physical
  - Mechanical
- Pre-mix
- Other ingredients that can be added to the mix
- Scraping down the bowl
- Cake processing techniques
  - Spreading
  - Rolling
  - Layering
  - Depositing

### Mixing methods

When making sponge cake products there are six mixing methods to choose from. Whilst the emulsifier method is the most common, the warm foaming and cold foaming method are the most basic. The other three methods are slight variations to the common methods.

1. Emulsified method
2. Conventional warm foaming method
3. Conventional cold foaming method

4. Conventional other foaming method
5. Ladyfinger method
6. Othello method

## Emulsified method (stabilised sponge)

A stabilised or emulsified sponge is one to which a stabiliser or emulsifier has been added.

This is the most common method due to it being so quick, convenient and almost foolproof. The emulsifier is basically a whipping agent that contains a molecule that preserves the emulsion of lipids (fat) and water. Emulsifiers allow the batter to hold the air that has been whipped in without falling by keeping the ingredients suspended and preventing separation. All ingredients, including the flour, are whipped together with the emulsifier in this method. The emulsified method also uses baking powder, instead of relying on air as a leavening agent. This means the sponge does not need to be baked immediately but can wait its turn for the oven, otherwise known as floor time. This is a big advantage in a busy bakery. Emulsifiers are available primarily through suppliers to the professional baking industry.

The **advantages** of the emulsified method:

- Lower ingredient cost, for example some of the egg replaced by water.
- Fresh egg can be replaced with egg pulp.
- Less hands-on skill required.
- Time saving (mixing times shorter).
- Batter has longer floor time.
- Baked sheets less prone to cracking for example Swiss roll.
- More easily made than conventional sponge (all-in method).
- It is a more stable batter and can be refrigerated/frozen for baking at a later date.
- The batter doesn't require the care in depositing and spreading that conventional sponge batter requires.
- Good quality sponge can be made with relatively little egg.

The **disadvantages** of the emulsified method:

- The baked sponge lacks the flavour of egg.
- The baked sponge is very soft, fragile and easily damaged.
- Because the sponge is so soft it becomes compacted and fragile when sprinkled with flavoured syrups for gateaux.

## What is a stabiliser/emulsifier?

Emulsifiers/stabilisers are made from a base of lecithin (found in egg yolk) and lacto albumen. These are available as either paste or powder, with the powder more commonly used in sponge premixes. It is important to note:

- An emulsion is fat surrounding liquid in a stable form.
- A stabilised sponge should have a smooth, silky texture that is not prone to collapse during baking/handling.
- Emulsifiers/stabilisers entrap air in the batter and raise the viscosity (thickness) of the batter, helping to prevent air cells collapsing.
- Emulsifiers/stabilisers enable the sponge to stand for periods of time before baking – unrefrigerated for short periods, refrigerated or frozen for several days.
- An emulsified sponge is very simple to make. Usually an ‘all in’ method is adopted.
- Emulsified sponge ingredients can often be left cold. (Particularly for best results when producing product for baking at a later time). The cold ingredients inhibit the baking powder until the batter is returned to room temperature or baked.
- Emulsifiers/stabilisers can be affected by silicone present in instant coffee, silicone paper, tin sprays and hand cream. The effect of silicone on the sponge causes bones or hard patches in the cake and collapsing of the structure in the oven.
- Sponge emulsifiers/stabilisers are a common method for the production of aerated sponge.

The action of emulsifier is to enable the two normally incompatible substances, fat (in the egg yolk) and water to combine to form an “emulsion”. The action of the emulsifier is further assisted in the beating process which reduces the particles of egg to the same size as those of water, as a result of which they remain more evenly distributed with them. When a perfect emulsion is obtained no separation takes place, and in order to produce such emulsions a third substance known as a “stabiliser” is required.

Most sponge emulsifier/stabilisers are made from a base of Lecithin and Lacto Albumen.

A “stabiliser”, when added, allows the product to retain moisture for a much longer period. Using a stabiliser in sponge making cuts down the quantity of eggs as a percentage of these may be replaced by water. In other words the stabiliser aerates the egg and water to stand up where water whisked on its own does nothing.

**Note:** Some stabilisers produce best results in cold batter temperatures, whereas other stabilisers produce best results in warm batter temperatures. Check with your supplier for recommended batter temperatures for the stabiliser you are using.

## Conventional warm foaming method

Using the warm method, eggs and sugar are placed in a mixer bowl and stirred over simmering water (so that the eggs do not cook) to about 43°C or until the sugar has dissolved completely. Rub a little of the sugar batter between your fingers to test the sugar is completely dissolved. This improves the emulsifying properties of the eggs. Once the mixture is removed from the heat, it is whipped at high speed until light in colour, creamy and the foam has reached its maximum volume. When a large quantity is produced, it is recommended that the mixture be whipped at a lower speed for about 5 minutes longer to stabilize the batter. Sifted flour is folded in, followed by the melted butter, if used. The main objective in the foaming method is to create a batter with the maximum amount of air. This is most easily produced when the ingredients are balanced properly. The ratio should be 2 parts eggs, 1 part flour and 1 part sugar, by weight.

For example: 12 whole eggs (approximately 680 g), 340 g of flour and 340 g of sugar.

## Conventional cold foaming method

The eggs and sugar are placed directly in the mixer bowl when using the cold-foaming method and then whipped at high speed until creamy and light in colour and the foam has reached its maximum volume.

You use the same formula as the warm-foaming method. The butter can be added as well but is generally left out since this method is typically used when the sponge will be soaked with a liqueur or flavouring, such as tiramisu or trifle. Due to part of the sugar melting in the oven rather than over the water bath as in the warm method, there are larger air bubbles in the finished sponge. These pockets are beneficial when the cake is used for the soaked-sponge desserts mentioned above.

## Conventional other foaming method

The other foaming method involves separating the eggs first. The yolks are whipped with part of the sugar to form a light and fluffy consistency, whilst the whites and the remaining sugar are whipped to soft peaks.

The yolks are gradually folded into the whites, followed by the sifted flour, part of which is replaced with finely ground nuts or almond paste, followed by any other ingredients, and then the melted butter, if used. If almond paste is used, it is folded into the yolks first and the mixture is then folded into the whites. Because this method produces a somewhat lighter sponge than the other two foaming methods, the sponge tends to shrink away from the sides of the pan more than is desirable. For this reason, it is best not to grease the sides of the cake pan. Instead, cut the baked sponge free using a sharp, thin knife.

**Note:** In many recipes, this method is used with or without the addition of baking powder.

## Ladyfinger method

Another sponge variation is the ladyfinger sponge, also known as a *pipéd sponge*, which is used not only for cookies but also for several classic desserts, including tiramisu and gateau Malakoff. In this method, more air is whipped into the batter so that it can be piped into various shapes without running. Ladyfinger sponges are meant to be very dry after baking, but they easily absorb moisture from fillings or syrup.

The traditional ladyfinger sponge can be varied by substituting traditional flour for gluten free flour to produce gluten-free products.

## Othello method

Othello sponge is comparable to the ladyfinger sponge, and the two are easily interchangeable. The Othello sponge has a lighter structure, due to less flour and more egg white. The batter should immediately be piped out and baked as soon as it is finished, as the mixture becomes tough if left to stand too long.

Each of the mixing methods use either a chemical or mechanical/physical aeration process to achieve aeration in the sponge batter.

Mix method	Aeration method
Emulsified method	Combination of both – dependant on recipe
Warm foaming method	Mechanical
Cold foaming method	Mechanical
Other foaming method	Combination of both – dependant on recipe
Ladyfinger method	Mechanical
Othello method	Mechanical

**Mise en place:**

*For better baking, practice mise en place, or 'putting in place'. This refers to having all of your ingredients prepped and measured before getting started. This is essential as it ensures you have all your ingredients available and prepped before you start processing. It also allows efficient workflow as often, time is of the essence.*

*This also means reading and understanding the instructions from start to finish and making sure the ingredients are the correct temperature. Unless otherwise specified, butter, eggs, and dairy products should be room temperature before starting a recipe. Butter must be softened, but not melted, for creaming with sugar and when making buttercream. Having all of your ingredients pre-conditioned makes for a more homogenous, smooth batter.*

## Aeration

Cake and sponge making uses two main methods of aeration:

1. Chemical
2. Mechanical (physical)

### Chemical aeration

Chemical aeration is achieved by using baking powder. Baking powder is a combination of an acid and an alkali. It often comes with a third ingredient, or neutraliser, added to keep it dry and prevent premature activity during storage.

### Baking powder

Baking powder is made up of:

- 2 parts acid, 1 part alkali (2:1 ratio)
  - an acid (acid sodium pyrophosphate)
  - an alkali (sodium bi-carbonate)
  - a neutral agent (flour or starch)

Types of acids used:

- tartaric acid—fruit acid
- cream of tartar—commercially made as a by-product of wine making

- acid phosphates—derived from phosphoric acid
- gluconic acid delta lactone (GDL).

Type of alkalis used:

- sodium bi-carbonate.

When mixed with liquid (water, milk or egg) and then brought into contact with heat (baking source), the acids will react with the alkali to release carbon dioxide gas. This gas becomes trapped in the structure (gluten/protein network) of the bakery product, causing it to rise. The baking process during the oven time ‘sets’ the product in its ‘risen’ state.

## Mechanical (physical) aeration

Mechanical aeration is the physical beating or whipping of a mixture to incorporate air, including:

- whisking eggs with sugar to trap air into the egg foam for sponges
- whipping cream to a light foam as a filling or topping
- beating fats and sugars together to produce a light buttercream (‘creaming the fat’ is a term used to describe the mechanical aeration of fats).

The two aeration methods, chemical and mechanical, are often used to supplement each other in sponge cake making. The beating of air into a mixture opens the crumb and texture of the sponge cake and baking powder assists with aeration in the baking process. The final product is a well-aerated, even textured and light sponge cake.

High-speed mixers are able to incorporate large amounts of air into a mixture very quickly. As the whisk or beater passes through the batter or foam, it creates a draft or pocket of air behind it. The ingredients, when mixed together, form a structure around the air bubbles and, as the mixture ‘thickens’ during the process, it traps the air. In the case of a conventional sponge, if baking did not take place this air would gradually make way to the surface and be lost.

To create good aeration, consider the following:

- Use clean equipment ensuring it is grease-free.
- Pre-condition the ingredients for maximum aeration.
- Carefully weigh all ingredients.
- Scrape down at regular intervals.
- Don’t interrupt the mixing cycle.

- Add ingredients in correct sequence/amounts.
- Use the manufacturer's guide when using pre-mixes.
- Maintain batter temperature.

To achieve good results:

- Have cake tins or trays prepared for immediate depositing and baking.
- Have ovens pre-set and ready to bake.
- Scale accurately for consistent product size and weight.
- Work with an assistant to help spread or deposit batter quickly.
- Avoid spillage, drips and waste.

## Sponge or cake premix

Premixes are commonly used with making a stabilised sponge cake.

Premixes have been in use in the baking industry for quite a few years now and, as time goes by, more and more become available. Premixes are also known as convenience foods.

Premixes are a mixture of ingredients that have been blended in a balanced ratio. The sponge cake pre-mix only needs to add a minority of other ingredients (egg, water and fat) to produce a batter, dough or similar and process it by scaling into tins, moulding or similar for baking.

Examples of premixes: There are premixes available to produce sponge, cake, bread, scones, pastry, custards, cream fillings and mousse fillings.

In earlier times, each baker/pastry cook made their own jams and fondant, but now the majority of bakers/pastry cooks purchase these ready-made from suppliers, therefore one could look upon these types of products as being premixes also.

What are the advantages of using premixes?

- It saves time in weighing up ingredients.
- It minimises the chances of making mistakes in weighing up.
- It helps to standardise the finished products.
- It can reduce the amount of ingredients needed to be ordered.
- It helps to simplify the storage of ingredients.
- Premixes are easy to use; most premixes are made by the all-in method or similar.

## Addition of other ingredients to the mixing method

### Cocoa powder

Cocoa powder is available in various qualities. The quality of cocoa powder is determined by the level of cocoa butter. The higher the level of cocoa butter, the richer the flavour.

### Dutch cocoa

Dutch cocoa has been treated with an alkaline substance to help produce a cocoa which has:

- a richer, less bitter flavour
- a richer and darker colour
- the ability to emulsify better with liquids (more soluble).

Plain sponge cake batters may be converted into chocolate sponges by the addition of cocoa powder. Cocoa powder will produce a dry crumb, therefore you need to add additional egg/water to the batter. The cocoa powder and extra egg/water will close the crumb, so you will need to increase baking powder to open the texture and produce the desired volume.

To do this successfully use the following guidelines:

- substitute approximately 10 – 20% of the flour weight with cocoa powder
- add extra egg/water equivalent to the weight of the cocoa
- add extra baking powder to help open the texture and increase the volume.

Recipe containing 1.000kg of flour can be adjusted as follows:

Ingredient	Measurement
Flour	0.900kg
Cocoa	0.100kg
Egg/water	+0.100kg
Baking powder	+0.010kg

Adding vanilla essence/paste to the batter will complement the flavour of the cocoa.

## Chocolate paste

As an alternative to using cocoa to produce a chocolate sponge batter, you can add a commercial chocolate paste to the batter.

The chocolate paste contains cocoa, flavours and colours and may be added to the batter at the beginning of the mixing procedure or after the batter has been mixed and is ready to be deposited – make sure that the paste is evenly mixed through the batter to avoid streaks in the baked sponge.

By using the chocolate paste there isn't any need to adjust the recipe, therefore the plain batter may be used to produce varieties other than chocolate sponge, and the remaining batter flavoured with the chocolate paste to produce chocolate cakes/sponges.

Add the paste as recommended by the manufacturer.

## 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.

### How often should I scrape the mixing bowl?

You should scrape the mixing bowl as often as necessary. 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 into tins/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/quicker. Remember, all of these are necessary to make your bakery more cost-efficient.

## Processing techniques

### Spreading

When making rolls or sheets, spreading refers to the spreading of the sponge mixture evenly on to the prepared tray using a crank handle palette knife. To maintain maximum aeration use minimum strokes of the palette knife and spread the mixture uniformly.

Spreading also refers to the spreading of fillings, such as jam, creams and buttercreams.

## Rolling

This term applies to sponge when making a Swiss, chocolate or honey roll. See below method for rolling sponge cakes:

1. To roll a sponge cake, you need to start by baking a large, flat sheet of sponge. The sponge sheet needs to be baked correctly with a firm crust and soft internal crumb. It's normally baked in a hot oven for a short period of time to assist in maximising the moisture content making the sponge sheet perfect for rolling.
2. Whilst still warm, place it on to a cloth, paper or mat covered with sugar or toasted coconut to prevent sticking.
3. When completely cold, use a palette knife to evenly spread your prepared filling.
4. Roll the sponge sheet on the cloth, making sure that it is especially tight at the beginning. It's very important to roll the sponge sheet firmly applying even pressure to ensure a uniform final product.
5. Trim ends off the roll and portion into required quantities.
6. Place seam-side down, finish with garnish and serve.

Follow the links to watch examples of rolling sponge cakes:

- [https://www.bbc.com/food/techniques/how\\_to\\_make\\_a\\_swiss\\_roll\\_cake](https://www.bbc.com/food/techniques/how_to_make_a_swiss_roll_cake)
- <https://www.bhg.com/recipes/how-to/bake/how-to-make-a-cake-roll/>

## Layering

This is the term used for stacking baked layers of sponge or cake on top of one another usually with a filling such as jam, cream or buttercream between the layers. It is important to stack and fill the layers evenly to ensure a uniform final product.

You will need to use proper tools and techniques to master the assembly of layer sponge products. Tools required for layering sponge cakes include:

- A turntable or rotating cake stand
- A cardboard cake round on top (this is used for transporting the sponge)
- A crank handled palette knife for icing
- Baking paper
- Your final sponge packaging for serving
- Clean as you go tools such as paper towels, clean cloths and warm water

Important information before cutting your cakes:

- Chill your layers before assembly
- Layers of the cake should be the same size
- Make sure all your layers are the same height
- Buttercream should be evenly spaced between layers

### **Step 1: Trim the cake**

Place one layer on an 8-inch cardboard round; place the round on the turntable, securing it with a dab of buttercream. With a long serrated knife, trim tops off both cake layers to make flat surfaces.

### **Step 2: Spread filling**

Using a crank handled palette knife, evenly cover the top of the first layer with the correct scaled weight of buttercream. Spread the buttercream so it extends beyond the edges of the cake. Continue to layer the cakes on top by carefully lining them up and adding buttercream between each layer.

Crumb coating and masking will be covered in *Topic 5: Processes, finishing and decorating*.

## **Depositing**

Depositing refers to the processing of dropping sponge or cake batter. This can be done by two methods:

1. hand depositing
2. piping.

Hand depositing refers to the process of hand depositing a batter into a prepared sponge or cake tin. The prepared sponge cake batter is deposited from the mixing bowl to the prepared tin by hand. This technique is acquired and it is important to scrape your hand on the side of the bowl to ensure a clean transfer of batter into the sponge tin. This is a specialised bakery skill that is attained by regular practice.

When making sponge fingers, the sponge batter is piped using a piping bag and tube, and onto a prepared tray in a uniform manner. This method of depositing is known as the piping method. It is important to monitor filling the piping bag to avoid dripping the batter.

***Using a bain-marie***

*A bain-marie is a double-decker pan/pot system that is used to warm ingredients over simmering water, which acts as indirect heat. It can be purchased as a specific set or easily made with a medium saucepan under a heatproof mixing bowl. Fill the bottom pan with a few centimetres of water and place the mixing bowl on top. Place it on the stove over medium heat and bring the water to a simmer. Most of the recipes that call for a bain-marie are for melting chocolate. This method can also be used for heating fondant.*



## Collaboration

### Activity 4.1: Reflection

Reflect on the sponge products you have produced so far. In teams, align the sponge mixing methods with each sponge products.

What was the product and what were some of the differences in the method that you can recall?

Mixing method	Type of sponge product	Method features
Emulsified		
Pre-mix		
Conventional		
Genoise		



## Self-check questions

### Activity 4.2: Check your knowledge

Read the questions carefully.

1. In what types of products is sodium bi-carbonate used as a chemical aerator?

2. List and describe the functions of egg in cake and sponge products?

3. Why is it important to carefully fold in your dry ingredients when making a conventional sponge?

4. Why is it important to sieve your dry ingredients in a chocolate conventional sponge?

5. Why is it important to pre-condition your ingredients when making a conventional sponge?

6. List three reasons why scraping the mixing bowl is important.

Topic 5

# Baking sponge products



## Topic 5: Baking sponge products

This topic demonstrates the tools and techniques required to correctly bake sponge products. It includes:

- Tray and tin preparation and techniques
- Baking temperatures and settings for size and type
- Loading and unloading of the oven
- Sensory identification of baking process

### Tray and tin preparation and techniques

Tins and trays are important in producing a good sponge cake. Choosing the correct size, shape and type of trays is especially important when trying to get a sponge to rise properly. The cause of most sponge cakes not rising is a sponge tin that is too shallow, if there isn't enough depth in the tin the cake won't rise. A tin of at least 4cm deep is recommended when baking sponge products.

Sturdy and heavy trays will last longer. The best kind are made from pressed steel, but unless you care for them correctly they may rust. There are a range of tins and trays available.

Tins and trays should be well cared for and protected to avoid rust and build up, which will result in uneven cooking. Warm soapy water is preferable to washing baking tins. Tin is a soft metal so care should be taken when cleaning — a sponge or soft dishcloth should be used, as abrasive cleaning will damage the tin. Silicone moulds can be rinsed in warm water and a soft cloth or sponge.

### Cake tin size

Round tin	Square tin
6 inches (15cm)	5 inches (13cm)
8 inches (20cm)	7 inches (18cm)
9 inches (23cm)	8 inches (20cm)
11 inches (28cm)	10 inches (25.5cm)

Round tin	Square tin
12 inches (30cm)	11 inches (28cm)
13 inches (33cm)	12 inches (30cm)
14 inches (35.5cm)	13 inches (33cm)

## Preparing tins and trays

Sponge tins/pans are normally prepared by:

Type of sponge	Preparation of trays and tins
Stabilised round	Combination of spraying, tin grease
Conventional round	Combination of spraying, tin grease
Genoise round and sheets	Combination of spraying, tin grease, paper
Stabilised sponge roll	Combination of tin grease, paper

Whichever method you prefer to use, make sure that you grease the base and all sides of the tins. Sponges sticking to the tins/pans will usually mean that you have to make the sponge again—wasting precious time and ingredients.

It is important to note:

- It is necessary to have all trays and tins ready for depositing of mixed sponge. Delays following mixing can cause premature reaction to baking powder, particularly in hot weather. Stability can be lost due to delay in processing.
- Prepare sponge pans, to be checked for absolute cleanliness, then greased. Grease to be applied with a soft brush in a flowing motion to ensure complete and even coverage of the inside surface of the tins.
- The importance of fat coating is to allow for even expansion in oven and complete release from tins when baked.
- The use of 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 rise and cause sticking problems.

## Baking

Typically sponges prefer a lower oven temperature. Bake round sponges at approximately 180oC- 190oC and sponge sheets between 200oC– 210oC.

### The baking process

A square tin holds approximately 25% more than a round tin of the same size. When using a square tin for a round tin recipe, use the specified time shown on the recipe; however, turn the cake as you are baking as the corners will tend to cook faster than the middle of the cake.

When depositing, spreading and piping the batter into tins, ensure to spread the batter level to allow even cooking.

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.
- 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.

## Using your sensors to assess the baking process

Follow the recipe instructions for both temperature and time in the oven. Ensure you monitor the product to determine 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.

Testing of the sponge can be done by the following method:

- Firstly, the sponge cake should have a light golden brown crust colour and has slightly shrunk away from the sides of the tin.
- During baking the bottom heat on the oven may be turned down to prevent a burnt base on the sponge.



Close-up sponge cake by [Tritritri](#) under [Pixabay licence](#)

If the sponge cake has a light golden brown crust colour, test in one of the following four ways:

1. **Touch:** Using your fingers, lightly stroke or lightly press the cake in the centre. If the cake is baked, it will spring back. If it is not baked, your fingers will leave shallow furrows in the surface.

2. **Toothpick test:** Pierce the centre of the cake with a toothpick or a clean skewer. If the cake is baked the skewer will be clean when removed. If the cake is not baked the skewer will be wet and have traces of cake batter on it.
3. **Sight:** Colouring, for lighter-coloured cakes look for browning. A nice light golden crust is a good indicator of a baked sponge.
4. **Edges:** Sponge cakes will begin to pull slightly away from the side of the pan and slightly shrink as they get closer to being fully baked.

## Cooling

After baking, remove the sponge from the tin/pan immediately, otherwise the sponges will continue to shrink as they sit in the tins/pans. Turn the sponges out onto a cooling wire. Always wear oven mitts or hot pads when handling hot trays.

Once your sponge product has cooled, check them for faults and defects. Pay attention to the colour, size, texture, taste and look. Are they ready for the next part of the process of cutting or decorating? Do you think your customers would be happy to pay the same price for each individual product?

Completely cooled cakes may be stored in labelled cake boxes in the refrigerator before being cut or finished.

Topic 8 will discuss on identifying, avoiding and rectifying faults in more detail, although you should be looking out for any faults throughout the whole production process.

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



## Video clip

### Activity 5.1: Tin preparation video

Watch the following video: Troubleshooting Baking Cakes and Cupcakes: Desserts and Baking Tips <https://www.youtube.com/watch?v=sFQaxQFb9aM>





## Practice activity

### Activity 5.2: Discuss the tin preparation in your workplace

1. What different sponge products require you to vary the tin preparation process?  
Why?

2. Consider: Are there variations on the processes between bakeries? Why do you think they are different?



## Self-check questions

### Activity 5.3: Check your knowledge

Read the questions carefully.

1. Explain why it is necessary to remove sponges from the tins/pans immediately after baking.

2. What are three safety precautions bakery staff need to consider when working with ovens and hot baking equipment?

3. Explain why some recipes ask you to remove sponge rounds immediately from the tin after baking, whilst sheet sponges specify leaving the sponge to cool for 10 minutes first?

4. What are three types of tin preparation techniques?

5. When using a deck oven, what temperature would you bake one tray of sponge rounds at?

6. What is the correct method for checking that a sponge cake is baked using a skewer

Topic 6

# Finishing and decorating



## Topic 6: Finishing and decorating

This topic discusses how you assemble, measure and prepare finishing ingredients to decorate and garnish sponge cakes to produce a final product. You will work with multiple fillings and tools to learn a range of decorating tips to finish your cake as required.

You will learn both practical skills and knowledge on the following:

- Assembling and measuring finishing ingredients
  - Masking and combing
  - Splitting and filling
- Apply jams, creams and icings to decorate, mask and finish sponge products
  - Jams
  - Fresh cream or imitation creams
  - Icing or basic butter cream
  - Rosettes, scrolls, rope, swirls
- Work with chocolate, jams and garnishes to finish sponge products
  - Writing simple celebration inscription
  - Chocolate shavings
  - Chocolate filigrees
- Using finishing tools and equipment to decorate sponge products
- Operating and monitoring the mixer to prepare icings and creams
- Identify sponge product faults and rectify
- Transferring and storing sponge products as per food safety requirements

### Assembling and measuring finishing ingredients

Our skills in decorating help to entice customers into the shop. We do this by displaying the products in the window in the best possible way — customers buy with their eyes. If a product doesn't look good, you're unlikely to sell it.

It is a useful exercise to go and view the shop display counters from the customer's standpoint and critically examine what they see.

Decorating is an art and a skill that requires knowledge, skills, practice and application. Continuous exposure to new ideas and techniques will enable you to produce items that meet with customers' expectations and see them returning week after week.

## Masking and combing

Masking and combing takes time and skill. Before starting the process, it is important to have all your tools within reach and to set up your workspace.

Your workspace should be clean and at the right height with your equipment and tools within easy reach.

Stand in a comfortable position with your feet slightly apart and directly in front of the turntable. You will need plenty of arm space, so be mindful of other staff in the bakery.

### The masking technique in 13 steps:

The following information and graphics are copied under s113P, Good Things Magazine (Online), How to mask a layer cake with step by step photos by Peggy Porschen (photography by Georgia Glynn Smith), <http://goodthingsmagazine.com/how-to-mask-a-cake/>, accessed 15/02/2019



**Step 1:** The first stage is the crumb coat. The crumb coat is useful for keeping the sponge in place and reducing crumb drag. Start by applying a generous amount of buttercream or icing. Use the palette knife to thinly and evenly spread the buttercream. It is important to make a good basic round shape.



**Step 2:** Working from the centre, spread the buttercream or icing towards the edges of the sponge cake and down the sides.



**Step 3:** Work the palette knife in a backward and forward motion whilst spreading the mixture. Rotate the sponge cake/turntable in the opposite direction to the direction of your spreading.



**Step 4:** Make sure all of the sponge cake is completely covered and that there are no gaps around the sides.



**Step 5:** Using a specialised side scraper, start on the far side of the cake and place the long straight edge against the sponge cake at a 45° angle, and the bottom of the side scraper sitting flat on the disc. Place your spare hand on the turntable, as close to your other hand as possible.



**Step 6:** Smooth the icing by rotating the cake against the direction of the side scraper. Ensure you go around the whole sponge cake.



**Step 7:** Repeat the process until all gaps have been filled and the cake is smooth.



**Step 8:** Use a palette knife to make the top of the cake smooth and neaten the edges. Remember to dip your palette knife in warm water and wipe it dry each time.



**Step 9:** Use the specialised scraper and the palette knife to remove any excess mixture.

**Step 10:** You can repeat the crumb coat as many times as you need to ensure the desirable smooth finish; however, ensure you chill the sponge cake in the fridge for at least 30 minutes between each coating. Always use a fresh buttercream or icing for each layer of crumb coat.

**Step 11:** Once complete, refrigerate the sponge cake until set. Once set, further decorating can occur.

## Splitting and filling

Sponge cakes require time, patience and lot of practice to develop the skills required to cut evenly, straight and cleanly. There are several steps in the process in achieving the best result:

1. Ensuring the cake base is completely cool prior to cutting. Cakes are more stable and easier to cut when cold.
2. Marking out the desired cake shape, size and number of levels to be cut.
3. Trim the cake to a perfect uniform shape. This may include trimming the top of the cake to a flat level surface, if required.
4. The layers should be cut with a serrated knife into appropriate horizontal even size layers. An even straight cut and uniform sizing is important for the cake assembly and final presentation. Care must be taken to ensure the knife remains level.
5. Once the layers have been cut, they need to be covered to prevent drying until ready to use. Stacking the layers on top of each other with paper on the top layer is an easy approach to covering.
6. The filling should be weighed or evenly divided to gain the required yield.
7. When filling each layer, the layers should be levelled with a crank handled palette knife or a straight edged palette knife so that all the levels are even.
8. When finished, the sides can be masked with roast nuts, chocolate shaving or icing, and the top decorated with the appropriate decoration. There are so many options for decorating including ganache, piping or a celebration cake with the addition of an inscribed plaque. You can find more information on crumb coating and masking in Topic 4.

Remember when splitting and filling it is important to minimise waste in order to maintain profit in the business and to reduce landfill.

## Apply jams, creams and icings to decorate, mask and finish sponge products

### Jams

Precondition your jams before use by mixing well and spreading. You want to remove all lumps so they do not clog your piping bag or create crumb drag whilst spreading with the palette knife.

There are specialised baking jams for use, such as Rasplum Jam which 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 donuts and cream buns.

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

## Creams

There are a range of creams used for filling sponge products, including:

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



Strawberry and cream sponge cake with three layers by [Einladung zum Essen](#) under [Pixabay licence](#)

## Fresh 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 when mixing in the sugar. It is usually in a powder form, used to thicken and stabilise the cream.

The advantages and disadvantages of dairy cream include:

Advantages	Disadvantages
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.

## 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.
- Some bakeries use 50% imitation cream and 50% fresh dairy cream to enhance the flavour and give the cream stability.

The advantages and disadvantages of imitation cream include:

Advantages	Disadvantages
Has better keeping qualities than dairy cream.	Lacks the flavour and mouth feel of dairy cream.
When whipped it 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.

## Jam and cream-filled sponges

Method:

1. Make sure that the sponges are completely cold before filling with cream.
2. Carefully cut the sponges with a good quality saw knife, using a short sawing action to avoid crumb drag. If necessary, turn the sponge as you cut it to make sure that you cut it evenly.
3. The jam should be free of lumps and can be either spread with a palette knife onto the cut base of the sponge or piped through a small plain tube onto the cut base or onto the piped cream.
4. Neatly pipe the whipped cream through a medium star tube—avoid piping the cream past the edge of the sponge as the cream will catch on the packaging material (paper bag, cardboard carton).
5. Neatly position the top layer of sponge on top of the piped cream.
6. Dust evenly with icing sugar through a fine sieve.

## Applying icings

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

Types of icings and their ingredients include:

Types of icings	Ingredients
Fudge icing	Icing sugar, cream shortening, milk powder, water and flavouring
Buttercream	Unsalted butter, sugar, egg and flavourings

Types of icings	Ingredients
Cream cheese icing	Icing sugar, cream cheese and butter
Fondant	Sugar syrup, water, glucose
RTR icing	Pure icing sugar, glucose, white fat, gelatine, acetic acid
Royal icing	Pure icing sugar, egg whites and acetic acid
Ganache	White or dark chocolate and cream

## Fudge icing

Fudge icing is an aerated icing used to decorate cakes and sponges. A basic recipe would involve using icing sugar, cream shortening, milk powder, water and vanilla essence. To increase the quality of the icing you can substitute the specialised cream shortening with butter. Milk powder is included to enrich the flavour of the icing; however, it is not necessary.

## Buttercream

Butter cream is indispensable in the bakery. Its primary use is for filling, icing, and decorating sponge cakes.

Butter cream should be light and smooth and should always be made from a high quality sweet butter. Icings made from all bakery specialised margarine and shortening can be unpleasant to eat – because of their higher melting point, they tend to leave a film of fat in your mouth – but a small amount of margarine or shortening added to the butter cream stabilises it without detracting from the taste. On very hot days or in hot climates, you can increase the ratio of butter to margarine to equal amounts, but only if absolutely necessary to prevent the butter cream from melting.

It is important to note:

- Various types of butter cream are used in the industry, and varieties are closely related to the richness of the fillings.
- Heavy butter creams usually contain added bulky ingredients such as custard.
- Light creams are usually restricted to fewer ingredients; some contain added egg white (meringue) and are well aerated.

- The general rule for type and use of butter creams would be determined by the lightness or density of the product, for example, sponge would use light cream, rich cake would use heavy cream.

Buttercreams are made by four different methods:

1. Swiss
2. French
3. Italian
4. German

Each method has a slightly different texture and mouth feel. Buttercreams are excellent in the finishing of sponge products as they set firm in the cool room and give the product stability, as well as providing a medium for flavours and textures.

## Cream cheese icing

Cream cheese icings have gained popularity, as the icing is not as sweet as a traditional fudge icing, and it is often used as an icing for a red velvet sponge cake. The common ingredients are cream cheese, icing sugar, butter and vanilla paste. Other flavours can also be added to create balance between sponge cake varieties. These may include lemon juice and zest, rosewater or orange zest. Generally, they are known as soft cheeses and may be referred to as Mascarpone, Cream cheese and Neufchatel.

## Fondant (ready to use)

Ready to use Fondant is a commercially prepared product made from sugar, water and glucose. It is used as a finishing medium to decorate sponge cakes. It can come in various colours, flavours and viscosity. It should be stored at 25°C in clean, dry conditions and protected from direct sunlight.

To achieve the maximum benefit from working with fondant you should follow the steps below:

- Prepare the fondant:
  - Heat the fondant in a bain-marie to 40° – 43°C. Do not heat above 43°C or the fondant will lose its gloss.
  - Add the colour and flavour.
  - If required, thin the fondant with stock syrup. Stock syrup is made by boiling 100mls of water with 120gms of sugar and letting it cool before use.

- Dip the top of the sponge cupcake in the fondant. Remove the excess fondant by wiping off with a palette knife. When icing sponge rounds, pour the fondant over the sponge cake and use your palette knife to spread uniformly to the edge. Avoid fondant dripping over the edges.
- Garnish the sponge cake whilst the fondant is still warm and before it dries.

**Note:** For further detailed information for working with Baking commercial products, you should refer to the Bakels website and download individual product specification sheets. This will assist you in getting the most of your products and more detailed information <http://aus.bakels.com/printpdf.aspx?id=http://192.168.201.3/productinfo/?id=2254>.

## Ready to roll (RTR plastic icing)

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.

## Ganache

Ganache is created when chocolate is emulsified with heated fresh cream. Depending on its intended use, the proportion of chocolate to cream varies from equal to more than double the amount of chocolate.

It is best made by first bringing the cream to the boil. After removing the cream from the heat source, it is poured onto the chopped chocolate, and stirred until smooth. Bringing the cream to the boil has a sterilising effect. Ensure the chocolate has melted completely and is thoroughly combined with the cream to produce a smooth and glossy ganache.

Dark, white or milk chocolate or a blend can be used. As milk chocolate contains less cocoa butter than dark, the recipes used have to be appropriately adapted.

If small amounts of liquid (liqueurs, spirits, flavouring pastes) are added, a balance may be achieved by increasing the chocolate or reducing the cream by the same amount. As alcohol easily vaporises when exposed to heat, it should not be added until the chocolate is completely melted and the temperature of the ganache is around 40°C.

The higher content of water and/or air (oxygen) in a ganache, the shorter its shelf life. The higher the proportion of cream (about 60% water) to chocolate, the shorter the time the item will stay fresh, and vice versa.

## Piping techniques

### Making piping bags

The paper should be of a good grade greaseproof or silicon paper. One single sheet will make eight good sized piping bags.

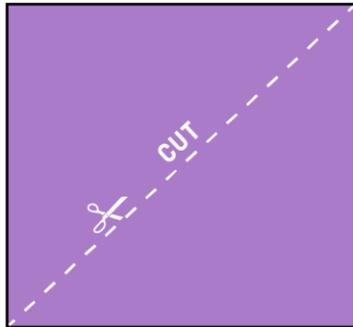
Take the sheet lay it out landscape fashion on the bench and fold in half from left to right, creasing well after each fold is made. Cut in two, lay the halves on top of each other and fold again, this time diagonally. Cut and place together, matching the triangles neatly on top of each other. Fold again, this time down the cut edge to create triangles of similar shape/size and make the last cut to produce eight triangles.

The piping bags are folded to make a pointed cone shape. This will be accompanied with a practical demonstration from the teacher, as there are a couple of different techniques that can be used.

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.

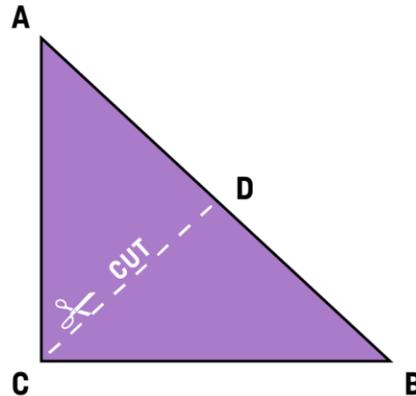
Partly fill with the piping medium to be used. Once again care has to be taken not to overfill the bag as the medium will run out of the top of the bag during piping.

## 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

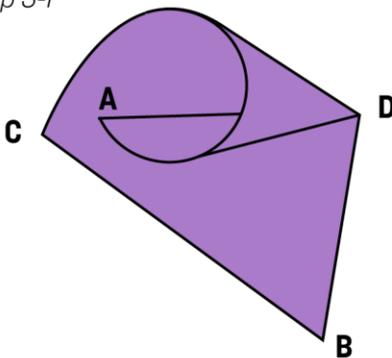
Lay the halves on top of each other and fold again, this time diagonally. Cut and place together - matching the triangles neatly on top of each other.

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

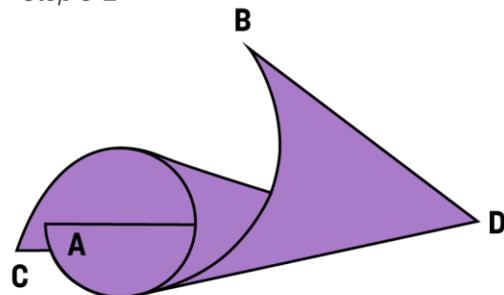
### Step 3

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

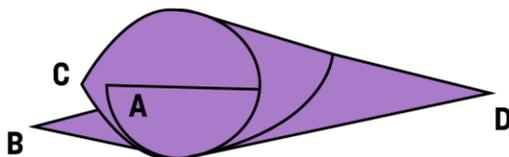
Step 3-1



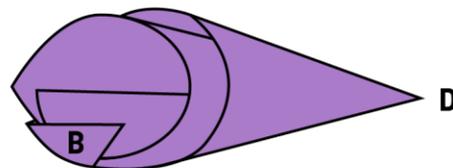
Step 3-2



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.

## 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 needs extra tools and equipment to tackle new demands. Additions to the toolkit may then include:

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

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 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 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 icing at the tips.

Lay out any other tools or equipment you need on a clean tea towel, close at hand and you are 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.

## Basic line piping techniques

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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Piping techniques require a lot of practice, you can practice piping onto glasses, mirrors or baking paper to allow easy wiping and to showcase your skills.

### Rosette

Rosettes are a modern piping decoration and can be altered to produce many variations to finishes. For example, two toned (two colours in a piping bag) or ombre (shading from light to dark) and the cake can be completely covered or used sporadically.

Piping finishes enhance visual appeal and the finished products are popular for use on celebration cakes and cupcakes.



Copied under s113P, Wilton.com (Online), How to pipe a rosette, <https://www.wilton.com/how-to-pipe-a-rosette/WLTECH-48.html>, accessed 18/02/2019

**Step 1:** Use a specialised star tip, tubes for rosettes have finer indentations than traditional star tubes. Hold the piping bag almost upright with the tip just slightly above the surface.

**Step 2:** Pipe a semicircle using a circular motion until it connects to the starting point of the rosette.

**Step 3:** As you close the circle forming the rosette, decrease the pressure on the piping bag to prevent a tip from forming on the finished rosette. Release pressure completely then pull away.

## Scroll border

Scrolls make a great border and provide variation to a piped finish.

Two common scroll borders are the C shaped scroll and a S shaped scroll.

### 1. C shape method

- a. For a C shaped scroll, use a star piping tube. Hold the bag at a 90o angle and pipe a small bulb shape. This will form the top of your C shape.
- b. Apply gentle pressure and twist your wrist to form the C shape.
- c. Release pressure completely then pull away.
- d. Make the next C shape over the tail of the previous C shape to make a border.



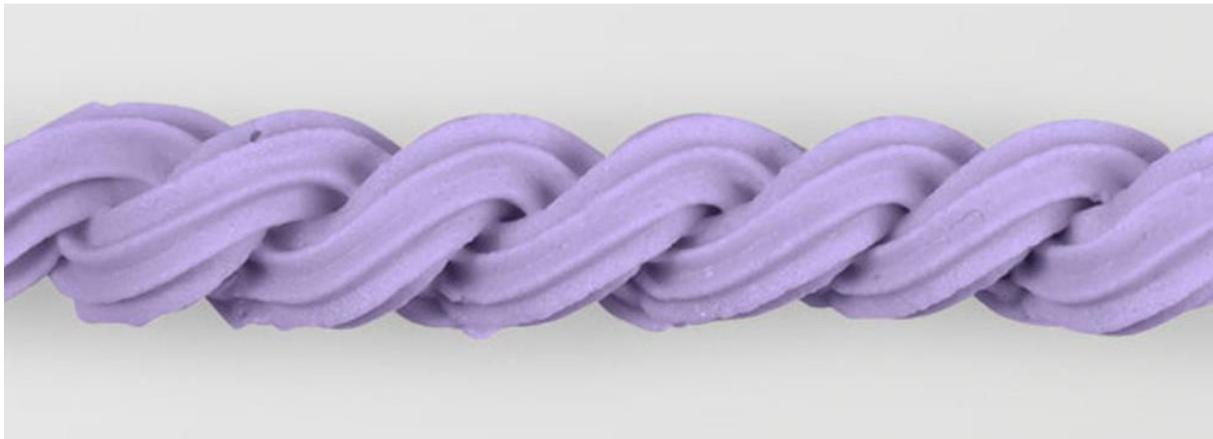
C shape scroll. Copied under s113P, Wilton.com (Online), How to pipe a C motion, <https://www.wilton.com/c-motion/WLTECH-212.html>, accessed 18/02/2019

## 2. S shape method

- a. For an S shaped scroll, use a star piping tube. Hold the bag at a 90o angle and pipe a small bulb shape. This will form the top of your S shape.
- b. Apply gentle pressure whilst agitating the bag up and down to make the beginning of the scroll. Releasing the pressure turn your wrist anti-clockwise and then clockwise to make an S shape.
- c. Release pressure completely then pull away.
- d. Make the next S shape over the tail of the previous S shape to make a border.

## Ropes

Ropes are another piping option for creating pretty border finishes. They make an excellent addition to themed and celebration products. You can use either a round or a star tip to create the effect.



Copied under s113P, Wilton.com (Online), Buttercream rope, <https://www.wilton.com/buttercream-rope/WLTECH-127.html>, accessed 18/02/2019

- **Step 1:** Using the star or round tip, hold the piping bag at a 45° angle. The tip should be lightly touching the surface.
- **Step 2:** Using a steady even pressure, squeeze the bag whilst moving the tip sideways in an S curve.
- **Step 3:** Stop applying pressure and then completely pull away.
- **Step 4:** Insert the tip under the bottom curve of the S shape.
- **Step 5:** Squeeze the bag with a steady pressure as you pull out, then lift the tip. Move up and over the tail of the S as you continue applying pressure to the bag to form a hook.
- **Step 6:** Continue to tuck the tip of the previous S into the bottom of the previous S before squeezing. Keep spacing even and piping thickness, size and length uniform.

## Swirl

Another simple and easy piping decoration is the simple swirl. It is popular with cupcakes and only takes minutes. Varying the tip size can alter the overall affect as demonstrated in the images below.



Copied under s113P, Wilton.com (Online), How to pipe a swirl, <https://www.wilton.com/how-to-pipe-a-swirl/WLTECH-7836.html>, accessed 18/02/2019

Cupcakes by [unicorn\\_owner](#) under [Pixabay licence](#)

- **Step 1:** Hold the piping bag at a 90° angle with the piping tip slightly above the cake surface.
- **Step 2:** Starting at the centre of the area, squeeze the piping bag, holding the tip in place momentarily.
- **Step 3:** Move the tip in a clockwise direction using a circular motion.
- **Step 4:** Stop pressure and pull tip away.

## Introduction to the use of colour

In a bakery there are three types of food colours available; they are 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 sponge cakes, then it is advisable to use a colour which dissolves in fat.

## 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 medium to be coloured, this will help to prevent streaking.

The 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 be made into liquid by dissolving in boiling water.	Deep staining can occur in contact with clothing, etc.

## Liquid food colour

The 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.

# 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:

1. Break chocolate into small pieces and place in a clean, dry stainless steel bowl
2. Melt slowly over gentle source of heat – double saucepan
3. Stir occasionally with a clean dry spoon to a temperature of approximately 45°C, take care not to scorch the chocolate

4. 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)
5. 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

Fat bloom and sugar bloom on chocolate are considered as faults on chocolate. There are two types of bloom:

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.

Advantages	Disadvantages
May be set in a cool position without the use of refrigeration.	

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

## Decorating with chocolate

Chocolate is a popular decoration medium for most baked products. The options for decorations using chocolates are endless. Piping chocolate shapes or inscriptions using templates, chocolate filigrees, chocolate shavings and curls are some examples of contemporary decorations. Consumers tend to choose chocolate decorated sweets over other baked products.

Chocolate decorations are good to have on hand as a finishing touch and can be pre-made and stored for saving time in production.

### Piping chocolate shapes (filigrees)

Piped shapes are often referred to as filigrees. There is no limit to the shapes and decorative patterns that can be created from piped chocolate.



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Popular filigrees include hearts, leaves, butterflies and monograms. You can trace your design first or work freehand directly on the sponge cake. To trace your design, you will need the template (your drawing on paper) and a clear acetate sheet over the top to pipe your design with the chocolate. The use of a template is helpful in producing uniform shapes and sizes.

Use tempered couverture or compound chocolate, and pipe through a small paper piping. It is important that the chocolate is smooth and free from any lumps. To avoid spills and mess take care not to over fill the piping bag.

**Standard method:**

1. First trace your design on a template. This can be any paper and you can easily download templates from online sources.
2. Place the clear acetate sheet over the top of the template.
3. Temper your chocolate and add stock syrup or alcohol until you have gained the correct consistency.
4. Add the chocolate to a piping bag, cutting the tip of the piping bag to the desired size. The size will determine the thickness of your piped chocolate. A general rule is the finer the piped line, the clearer and more visually appealing.
5. Gently squeezing the piping bag, pipe the design on to the clear acetate sheet. When producing filigrees, the tip of the piping bag should not touch the clear acetate sheet, and instead should sit approximately 1-2 millimetres above and the chocolate should drop on to the sheet. When ending the design, you need to ensure the design connects without any breaks to ensure when set, the filigree shape will lift off in one piece.
6. Once the design is finished, (you can use multiple designs on the plastic), leave to harden at room temperature for approximately 15 minutes. In hot and humid conditions, you may need to set your chocolate filigrees in the cool room for a short time. To avoid bloom on the filigrees, do not leave the product in the cool room for more than 5 minutes.
7. When it is hard you can then use a palette knife to gently lift the chocolate from the acetate sheet. It can be transferred from the acetate sheet directly to the sponge product or stored for future use.

### Microwave method:

Another simple way to use melted chocolate for piping is to add chocolate to a microwaveable dish. Place in the microwave and heat for short bursts until the chocolate has melted. Add the melted chocolate to the piping bag, ensure there is no air in the chocolate, snip the end of the piping bag and then begin.

### Inscriptions

Similar to piping with icing, you can also use chocolate to write inscriptions and decorate sponge cakes. Always remember to check, and double check, spelling before committing to sponge cake writing. Drawing the design and practicing on a paper template before writing on your sponge cake is helpful with spacing and technique.



Chocolate dessert with decorative inscription by [ducken99](#) under [Pixabay licence](#)

You can also use a plaque which involves piping a chocolate inscription on to a pre-prepared plaque, made from ready to roll icing. A plaque is useful for quickly meeting consumer needs for celebration products. The sponge cake can be decorated last minute with a customised plaque.

Another option is to pipe the chocolate inscription directly on to the cake board. If mistakes occur ensure the chocolate is completely set before scraping off the board and rewriting.

Tempered chocolate is commonly used for chocolate inscriptions. Adding a fine syrup or alcohol to tempered chocolate will thicken the chocolate immediately and allow you to gain the desired consistency required. Using 1-2 drops, slowly add the alcohol/stock syrup whilst stirring gently until you get the desired consistency.

For more tips on decorating with simple inscriptions and filigrees, visit <https://www.wickedgoodies.net/2012/08/cake-writing-tips/>

## Cutting chocolate shapes

Chocolate shapes are another form of decoration and are generally made from different cutters and shapes, rather than using a piping bag. Chocolate shapes are readily available from suppliers but are expensive to purchase. Simple shapes can be cost effectively produced in the bakery by skilled and creative staff. With training and regular practice, it is an easy skill to master and produces an endless supply of decorating shapes.

Pour the melted chocolate onto a sheet of clear acetate sheet. Using a palette knife, spread the chocolate even and uniform. It is a good idea to not be heavy handed with your chocolate, aim for a slighter thickness for better visual appeal, due to the expense of the chocolate and the setting time.

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 clear acetate sheet from the shapes – store the cut shapes in a food safe container and in a cool position.

## Chocolate shavings

Tempered couverture chocolate can be used for making shavings; however, it is just as easy to make with melted compound chocolate.



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- **Step 1:** Melt the chocolate using the appropriate method.
- **Step 2:** Spread the chocolate onto the marble slab evenly with a palette knife.
- **Step 3:** Allow the chocolate to set, but not too hard or brittle. Use a flexible metal scraper to scrape over the top of the chocolate to produce chocolate shavings.
- **Step 4:** Before decorating the sponge product with chocolate shaving, place the shavings in in a food safe container in the freezer to harden for approximately 10 minutes. Once the shavings are very firm you can break them into smaller pieces if desired and add them to the sponge product. Store any leftover shavings in a food safe container in a cool area.



## Video clip

Watch 'How to make chocolate garnishes decorations tutorial' below or visit:

<https://www.youtube.com/watch?v=h8g9dZWXCb4>



### ***Tips for decorating with chocolate:***

*Do not create designs that are too complex or too busy. Simplicity, accuracy and cleanliness of the designs are essential for best results.*

*Clean your work area progressively to avoid getting crumbs on to the decorated surface of your cakes.*

*Use appropriate colour schemes.*

*Keep all aspects of the designs in proportion.*

## Storage of ingredients

Ingredient storage is not only an essential part of running a successful business, but an essential element of quality control which must be observed by all employees involved in the production, finishing, selling, packaging and handling of bakery items. To avoid wastage and/or spoilage of valuable stock and product, the correct storage conditions must be met.

### Wet storage (including refrigeration or freezer space)

For the storage of fresh produce such as vegetables, fruits, dairy goods, meats, custards and other prepared fillings or batters. Ideally, strong smelling goods such as fish, onions and smoked produce should be stored separately from other perishables to avoid taste transfer and contamination.

Other storage points of importance:

- Avoid overstocking.
- Rotate all stock.
- Wash dried fruits as required to prevent fermentation.
- Wrap/rewrap partly used foods well to avoid flavour transfer or contamination.
- Store foodstuff (especially fats and oils) away from strong sunlight or other heat sources.
- Cooked and uncooked foods should be stored in separate areas.
- Thaw frozen ingredients slowly over a period of time and in a cool room or a refrigerated space.
- Date all stored foods and check regularly.
- Conduct stocktakes regularly.
- Practise safe handling procedures by using lifting gear, as needed, for heavy or large items.
- Conduct regular pest inspections.
- When receiving stock, be alert to broken seals, dented cans or damaged containers and ask supplier to replace them immediately.

## Dry storage (cool, dry, well-ventilated area away from damp conditions)

Powdered and dry ingredients, such as flour, sugar, milk powder and starches, have been treated to extend their storage capability. They are readily affected by damp conditions, as they are hygroscopic by nature and easily absorb moisture. This attraction of moisture, at best, renders the ingredients lumpy and difficult to mix during production and, at worst, can cause fermentation, also destroying any hygienic barriers introduced by drying. The only solution is to dispose of the affected ingredient.

Canned goods should also be stored in dry conditions.

### Storage of baked product

There are some common problems with storing baked products. To avoid loss or damage during storage, customised solutions should be addressed for each of the challenges faced by baked products, such as:

- drying out – moisture loss
- mould – moisture gain
- foreign matter and dirt transfer
- physical damage – stacking too high, squashing, breakage
- contamination – smell, taste and cross-contamination from uncooked foods or cleaning agents.

Storage temperatures:

- Refrigeration and cool room spaces: 0°–4°C
- Freezer temperature from as low as -18°C
- Careful wrapping by ‘heat seal units’ or vacuum packing can prevent moisture loss/gain and can extend shelf-life, even at room temperature



## Collaboration

### Activity 6.1: Piping

Your teacher will demonstrate piping.

After the demonstration, practice piping with the following shapes to build up your skills and techniques:

- Swirls
- Scrolls
- Rope



## Self-check questions

### Activity 6.2: Check your knowledge

1. Explain the difference between an icing sugar mixture and pure icing sugar used in decorating or finishing.

2. Name a sponge product you can use 'recycled' cake in?

3. List two considerations when cooling of a sponge round.

4. List the functions of chemical aerators when used in the sponge cake making process?

5. When storing flours, what is the safe manual handling processes?

6. What are the correct storage procedures for butter and margarine/shortenings?

7. List two possible storage areas for ingredients?

8. What are two different products used for chemical aeration?

9. List five challenges affecting shelf life of baked products.

Topic 7

# Quality and faults



## Topic 7: Quality and faults

In this topic, you will learn about the sponge production processes to eliminate faults and wastage and produce consistent quality products. Baking staff are required to plan, organise and implement tasks required to achieve production outcomes, which involves interpreting key information from recipes, ingredient labels, baking equipment, operating instruction and end-product specifications. Staff should be able to analyse product and process faults and decide on appropriate action.

You will learn about the common faults specific to each area below:

- Ingredients
- Mixing and processing
- Temperature
- Aeration
- Emulsifiers and stabilisers
- Sponge faults overview

### Common faults: Ingredients

In this section we will be considering the types of faults that occur in sponges, what causes the faults, and what can be done to fix the faults or to prevent them.

There are basically two types of sponge batter, namely conventional egg sponge and stabilised/emulsified sponge. These two types contain some different ingredients and also different proportions or percentages of ingredients. They are also made by different methods, the all-in method for the stabilised sponge and the egg/sugar foam method for the conventional sponge. The use of incorrect mixing and handling techniques for the conventional sponge often causes faults in the baked product.

### Flour for sponges

Generally speaking, a soft flour is used for making sponges. Otherwise a strong flour can be blended with cornflour to produce a flour similar to soft flour. The soft flour is used to produce a soft crumb.

## Sugar for sponges

A fine crystal sugar is used for sponges as the sugar assists in the mechanical aeration of the batter, sweetens the sponge, produces a soft crumb, improves the crust colour and helps to keep the sponge moist.

## Egg for sponges

Both shell egg and egg pulp may be used for sponges. The egg adds flavour, improves the volume, helps colour the crumb and crust, improves the keeping quality of the sponge, and provides structure by the cooking of the proteins.

## Fats/oils for sponges

Rarely is fat or oil added to sponge batters. If used, the fat or oil is only added in small amounts, mainly to help flavour the sponge and improve the keeping qualities by keeping the sponge moist.

## Temperature control in batters

Correct batter temperature is also critical in achieving a good quality product.

Refer to your recipe specification sheet as guidance, as temperatures vary depending on the mixing method used for sponge cake production.

## Mechanical aeration of sponge batters

The temperature of the egg plays an important part in aerating when mixing by machine.

When whisking eggs or egg whites, such as for a conventional sponge batter, you need to precondition the eggs to approximately 30°C for optimum aeration.

Be careful when preconditioning eggs not to warm them too much, because if they become hot enough the egg could start to cook (coagulate). Coagulated egg will not aerate mechanically.

When mixing stabilised/emulsified sponge batters you will need to check with the supplier/manufacturer of the stabiliser/emulsifier or premix.

Some stabilisers/emulsifiers provide the best results when the batter is quite cool, so we use chilled eggs and water in the batter. Other stabilisers/emulsifiers need warmer batter temperatures to provide a quality product, so we use warmed water and eggs in the batter. Ask the supplier/manufacturer of the stabiliser/emulsifier for the recommended batter temperature — this will give you a guide as to whether to chill or warm the liquids.

## Sponge and cake emulsifiers/stabilisers

Emulsifiers/stabilisers help to combine the fats/oils with water in the batter. It is important to note:

- When mixed mechanically they help to entrap air in the batter.
- They raise the viscosity of the batter.
- They allow you to partially substitute the egg with water in cake and sponge batters.

The table below lists a number of faults that may occur in sponge batters, with suggested causes. From your knowledge and understanding of ingredient functions and interactions, and processes of making and baking sponge batters, you should be able to recommend ways of fixing or preventing the faults.



## Practice activity

### Activity 7.1: Identifying sponge faults

Throughout this unit, your teacher will provide examples and practice activities relating to this table. Refer back to the table each time you need assistance in identifying sponge faults and add the remedies when required.

Product faults	Cause of faults	Remedy
<b>Sponge sinking in the centre</b>	<ul style="list-style-type: none"> <li>too much sugar</li> <li>too much baking powder</li> <li>too much stabiliser/emulsifier</li> <li>bumping the tray during baking</li> <li>under baking</li> </ul>	
<b>Poor volume</b>	<ul style="list-style-type: none"> <li>ingredients not preconditioned</li> <li>not enough mechanical aeration</li> <li>not enough chemical aeration</li> <li>not enough stabiliser/emulsifier</li> <li>poor quality egg</li> <li>oven too cool</li> <li>oven too hot</li> <li>over handling of conventional sponge batter</li> <li>too much flour</li> <li>flour too strong</li> <li>too much egg or water</li> <li>left too long before baking</li> </ul>	
<b>Poor keeping qualities</b>	<ul style="list-style-type: none"> <li>oven too cool</li> <li>not enough sugar</li> <li>not enough egg</li> <li>overbaked</li> <li>not enough milk or water</li> <li>too much chemical aeration</li> <li>too much mechanical aeration</li> </ul>	
<b>Top crust cracking</b>	<ul style="list-style-type: none"> <li>oven too hot</li> <li>flour too strong</li> </ul>	

Product faults	Cause of faults	Remedy
<b>Crust too thick</b>	oven too hot oven too cool too much bottom heat in the oven not enough moisture in the oven overbaked	
<b>Coarse open texture</b>	too much sugar too much chemical aeration too much mechanical aeration too much stabiliser/emulsifier	
<b>Very close texture</b>	over handling of conventional sponge batter flour too strong not enough mechanical aeration not enough chemical aeration too much flour too much water or milk	
<b>Coarse open texture with hard core in the base</b>	flour over chlorinated (stabilised sponge)	
<b>Swiss rolls cracking</b>	oven too cool overbaked too much flour sponge too thick rolled too loosely	



## Self-check questions

### Activity 7.2: Check your knowledge

1. Explain how sugar improves the keeping qualities of sponges.

2. When using sponge stabilisers/emulsifiers the optimum batter temperature may vary between the different types and brands that are available. Explain how you should determine the required batter temperature to produce the best results in the baked sponge.

3. Why do sponge rolls crack when they are being rolled? Tick all the possible causes:

- Sponge sheet too thick
- Sponge sheet dried out during baking (overbaked, oven too cool)
- Sponge sheet dried out after baking
- Sponge sheet not rolled tight enough
- Too much filling on the sponge sheet

4. Why is it important to record the results of your baking on the production schedule?



## Collaboration

### Activity 7.3: Possible faults in sponge making

To illustrate possible faults in sponge making, produce a sponge batter and follow the instructions from your trainer to purposely produce faults in sample sponges.

In groups, make a variety of sponges following one of the scenarios below:

- Use baker's flour instead of Hi ratio flour
- Leave out the sponge stabiliser/emulsifier
- Leave out the baking powder
- Double the amount of mixing time
- Halve the amount of mixing time

What were your results?

Topic 8

# Packing up and cleaning down



## Topic 8: Packing up and cleaning down

This topic is about how you complete your work in the bakery workplace. You will learn about the following:

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

### Cleaning equipment and your work area

Cleaning and disposing of waste as you work is important so that 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 in.

Cleaning equipment so that it is ready to use for the next day, or next use, 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 cleaning materials you are using – MSDS
- Using personal protective equipment to prevent skin reactions and injury
- Working safely, especially with water that is near or close to electrical equipment
- Ensuring all equipment and products for cleaning are used correctly and re-stored after use
- Ensuring you use signage on mopped floors
- Following 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 8.1: Your workplace

Think about your workplace or the TAFE kitchen or bakery.

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

2. How do you dispose of waste?



## Self-check questions

### Activity 8.2: Check your knowledge

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 sponge products are provided in the Glossary. Talk to your trainer if you can't find what you are looking for.

Common words	Description
Acid	Aids cooking of the protein in egg for example acetic acid.
Aeration	Adding air to a product.
Albumen	The name given to egg whites – the primary ingredient in meringue production.
All in-one	A method or process for cake and biscuit production where all ingredients are mixed together in one stage.
Baked Alaska	A meringue and ice cream dessert served cold.
Baking	To bake in in an oven.
Baking powder	A type of chemical aerator.
Bavarois	A classical type of mousse. Confection made of milk, egg yolks, sugar and cream, set with gelatine.
Boiled meringue	See Italian meringue.
Cake hoop	A metal ring used in the production of gateaux and torte and entremets.
Caramelisation of sugar	The browning of sugar by heating, such as the browning of sugars in the crust of bread and cake during baking.
Choux	Refers to the cabbage like appearance of the pastry of the same name, made with boiled water and butter, flour and eggs.
Cold meringue	See French meringue.

Common words	Description
Conditioning ingredients	Warming ingredients to ensure optimal aeration.
Coulis	A mixture of fruit and sugar brought to the boil and mashed. Usually made of berries but can be made with other fruits. Used as a flavouring or as a sauce.
Couverture	Superior quality eating chocolate.
Cream	A dairy product that is aerated and used in Black forest Gateaux.
Cream of tartar	A leavening acid used in baked products. It is bi-product of the wine production.
Croquenbouche	An assembly of profiteroles held together by caramel in a cone shape. A French wedding cake.
Custard	Made from eggs, milk and sugar, for example crème patisserie.
Decorate	To finish a baked product to give optimal visual appeal.
Dacquoise	A type of meringue and nut product.
Deposit	A term to describe transferring batter into a tin or piping bag.
Egg white	See Albumen.
Entremets	<p>Plural: a French term that literally means 'between servings'. Traditionally entremets were small sweet or savoury dishes served between courses.</p> <p>In recent times entremets have evolved as standalone desserts and a way for patisserie chefs to showcase their skills and creativity.</p>
Emulsion	The mixing together of two ingredients, which are not easily mixed, such as fats/oils and water.
Eton mess	A type of meringue dessert made from crumbled meringue.

Common words	Description
Flashing	To colour quickly in a very hot oven.
Foam	The term given to whipped eggs or egg whites.
Folding	The term to describe gently mixing ingredients together without stirring or beating. This technique is often used when ingredients such as eggs whites or cream have been aerated to help maintain the form of the aerated ingredients.
French meringue	A mixture of whipped egg whites and sugar.
Ganache	Made from cream and chocolate.
Garnish	Can be made of chocolate, sugar or baked and used to decorate gateaux torte, entremets and meringue products.
Gâteau	French for cake (plural: gâteaux).
Genoise sponge	A traditional/conventional sponge with added melted butter.
Glaze	Also can be known as an icing, glacage or coating, used to seal an assembled product, such as a sacher torte
Hygroscopic	Absorptive of moisture; readily absorbing and retaining moisture.
Humidity	Refers to the amount of moisture in the atmosphere.
Italian meringue	A mixture of whipped egg whites and sugar boiled to the softball degree.
Japonaise	A meringue and nut product.
Linzer torte	Austrian torte made from a type of short pastry and usually finished with a lattice design filled with jam.
Macarons	Often called French macarons, they are meringue based confection. Not to be confused with macaroons.

Common words	Description
Macaron towers	A cone shaped macaron product.
Masking	Coating the sides of a cake with icing.
Meringue	Made from egg white and sugar.
Millefeuille	Layers of puff pastry filled with a custard based filling.
Mirror Glaze	A shiny chocolate based glaze.
'Mouth feel'	Refers to the physical sensation food or beverages have when consumed. It is different to the taste sensations of sour and sweet. It is more about the texture and feel. A 'good mouth feel' indicates the product or ingredient creates a pleasant or acceptable experience.
Optimum	The best or most favourable conditions.
Paris brest	A choux pastry product filled with a custard based filling and decorated with praline.
Pasteurised	A process of partial sterilization making the food safe to eat.
Pavlova	A sweet meringue based dessert made with egg white, sugar, vinegar and cornflour, baked in a low heat oven.
Personal protective equipment (PPE)	Clothing and equipment used to ensure personal safety in the workplace.
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.
Poured sugar	Sugar that has been heated and poured into a decorative mould to set.

Common words	Description
Praline	The term praline is used differently around the world. There are three different types of praline: <ol style="list-style-type: none"> <li>1. Hazelnut paste</li> <li>2. Nut brittle</li> <li>3. A filled chocolate</li> </ol>
Profiteroles	A type of choux pastry product used in Gateau St. Honoré.
Protein	Found in flour and forms the structure of baked goods.
Pulled sugar garnishes	Sugar that has been heated and pulled to form garnishes, for example sugar rose and sugar ribbon.
Sabayon	Egg yolks, sugar and, sometimes, a liqueur, whipped to a light texture.
Sacher torte	A type of chocolate cake invented in Austria.
Scorched	Caramelised meringue processed by a culinary blowtorch.
Seize	The action of chocolate thickening when coming into contact with water.
Solid oven	An oven that has been preheated to obtain the correct temperature.
Sponge	A baked product made from eggs, sugar and flour.
Stability	The thickness of a product.
St. Honoré gateau	A French gâteau made with puff and choux pastry.
Strawberry watermelon cake	A popular product made from strawberries, meringue and watermelon.
Sugar syrup	A solution of sugar and water.

Common words	Description
Swiss meringue	A mixture of whipped egg white and heated sugar.
Tant pour tant	Mixing almond meal and icing sugar together
Thermometer	Instrument for measuring temperature.
Tempering	To prepare for use by means of temperature. Used when referring to fondant icing and chocolate.
Torte	German for cake (plural: tortes/torten).
Volume	The amount of batter or filling.
Warm meringue	See Swiss meringue.

# Resources

## Topic 1:

- <http://www.safework.nsw.gov.au/law-and-policy/worker-and-visitor-obligations/worker-obligations>
- [Safety and health in bakeries factsheet](#)
- [International Hazard Datasheets on Occupation](#)
- [Video sponge production](#)

## Topic 2:

- <http://www.safework.nsw.gov.au/law-and-policy/worker-and-visitor-obligations/worker-obligations>
- [Safety and health in bakeries factsheet](#)

## Topic 4:

- MLA (Modern Language Assoc.). Huff, Tessa. Layered: Baking, Building, and Styling Spectacular Cakes. Stewart, Tabori & Chang, 2016
- APA (American Psychological Assoc.). Huff, T. (2016). Layered : Baking, Building, and Styling Spectacular Cakes. New York: Stewart, Tabori & Chang

## Topic 5:

- <https://www.stayathomemum.com.au/recipes/choosing-the-right-baking-tins-and-moulds/>
- <https://www.bestrecipes.com.au/article/baking-tins-and-trays-a131.html>
- <http://www.sweet2eatbaking.com/conversion-guide/>
- <https://www.thekitchn.com/baking-school-day-19-layer-cakes-222497>
- <https://www.youtube.com/watch?v=Jz6gr7kQlxk>

## Topic 6

- <https://www.facebook.com/100011071787795/posts/707914582920928/>
- <https://queen.com.au/learn-item/tutorial-food-colour-mixing-chart-2/>

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