

Student workbook

Produce pastry products and fillings

Unit code and name:

FBPRBK2002 Use food preparation equipment to prepare fillings

FBPRBK3001 Produce laminated pastry products

FBPRBK3002 Produce non laminated pastry products

FBPRBK3003 Produce specialist pastry products



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Version: 1.0

Date created: 15/11/2018

Date modified: 4/03/2019

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RTO Provider Number 90003 | CRICOS Provider Code: 00591E

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Getting started

Welcome to Produce pastry products and fillings.

- FBPRBK2002 Use food preparation equipment to prepare fillings
- FBPRBK3001 Produce laminated pastry products
- FBPRBK3002 Produce non-laminated pastry products
- FBPRBK3003 Produce specialist pastry products

This Learner Guide will provide you with knowledge on producing non-laminated, laminated, and specialist pastry products, as well as using equipment to prepare fillings. Throughout this workbook you are 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.

At the very end of the Learner Guide, you will find a glossary which lists terms used in Baking. If you find a term you are unfamiliar with in your reading, check the glossary. You can also add any new terms you learn during this unit into the glossary.

Happy learning!

What will I be doing?

- Reading information in this Learner Guide.
- Referring to the Bakery Moodle and the Virtual Enterprise.
- Researching, collecting images of pastry products and fillings, and making notes.
- Following your teacher's instructions about practical activities and questions in this Learner Guide.

Learning outcomes

Throughout this unit you will learn the skills needed to produce a variety of pastry products and fillings in a commercial baking environment, including how to:

- Prepare your work areas and yourself for work
- Prepare fillings for non-laminated, laminated, and specialist pastry products
- Mix non-laminated, laminated, and specialist pastry dough.
- Form and fill non-laminated, laminated, and specialist pastry products
- Pre-bake finish non-laminated, laminated, and specialist pastry to meet end product specifications
- Bake non-laminated, laminated, and specialist pastry products
- Transfer finished non-laminated, laminated, and specialist pastry products.

Topics

There are nine topics to complete within this learner guide.

Topic number	Topic name
Topic 1	Preparing for work
Topic 2	Ingredients
Topic 3	Prepare fillings for pastry products
Topic 4	Pastry doughs
Topic 5	Form and fill pastry products
Topic 6	Pre-bake finish pastry products
Topic 7	Bake pastry products
Topic 8	Post-bake fill and finish pastry products
Topic 9	Packing up and cleaning down

As you work through the topics in this unit you will be asked to repeat the following tasks for each practical activity:

- 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, as miscalculations can produce unwanted results and waste.

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

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

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



Check products to identify faults and rectify

Checking and monitoring your products throughout the preparation and baking processes will ensure the product meets the expected standard. If the product made 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 of making your pastry.

Checking may be as simple as inspecting doughs and batters to make sure it is mixing to meet the product requirements. You can then make adjustments, such as changing speed or timing on a mixer, or making a change to the shape of a dough piece.

Checking and rectifying faults where you can are important during all processes of making specialist pastry products. You will learn to recognise when things don't go as expected.

Variations will occur for many reasons, including:

- 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 a suggested example of a Production Schedule included in Appendix 1 of this Learner Guide:

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

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

Pastry products overview

Pastry production is a general term that covers a wide variety of products that may be traditional or contemporary. Pastry products are quite versatile and can be either sweet or savoury.

The various pastry products made in the baking industry are usually made from the same basic ingredients flour, water, fat and differ by the preparation techniques used which when processed provide different characteristics that are featured in a range of specialist pastry products.

Common pastry products made in the baking industry include a range of savoury pastry items, such as gourmet pies, sausage rolls, and sweet pastry products including lemon tarts, salted caramel tarts, vanilla slice, eclairs and profiteroles.

Speciality pastry products are a popular and important food item and are regularly eaten in diets of many people across the world.

Specialist pastry products include products made from both laminated and extensible doughs. Some examples of sweet and savoury specialist pastry products include delights such as apple strudel, kataifi nut rolls, curry puffs and spinach and ricotta sfogliatelle.

Given the popularity of Australians having on-the-go breakfasts and lunches, a greater range of products is anticipated to be marketed on convenience, and increasingly producing healthy, sweet and savoury pastry products for time-poor consumers.



Gourmet puff pastry by [lccjoca](#) under [Pixabay licence](#)

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:

- The baking industry regulatory (including personal hygiene)
- Preparing the work area to meet food safety and workplace health and safety requirements
- Personal protective equipment (PPE) for working safely.
- Production Scheduling – techniques and considerations
- Mis en place
- Equipment use for pastry and filling production
- Industrial mixer and attachments
- Preparation of trays
- Knives used to prepare fillings
- Pots and pans, and the principles of cookery methods
- Selecting ingredients and checking ingredients to confirm quality and quantity

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 maintain high standards of personal hygiene, including washing and drying your hands before commencing work, after using the toilet and between tasks.

- You use barriers such as disposable gloves and hair/beard nets to help avoid contaminating food products and surfaces.
- You regularly clean surfaces, equipment and utensils.
- Clean up spills on the floor immediately.
- Store, thaw, condition and reheat food correctly to avoid cross contamination and/or spoiling. This is particularly important when making pastry products and/or fillings in advance and freezing them for later 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.

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

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

Personal protective equipment (PPE)

It is very important that you know the 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.



Practice activity

Activity 1.1: Equipment

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

1. What are two common injuries caused by equipment?

2. Name two machines that cause the most accidents.



Maintain records

Production schedule

A production schedule is an important document that tells you what work needs to be done, the volume of the production run and how it is to be done. Throughout your course you will be expected to complete production schedules for practical activities before you commence work and when you finish your work.

A production schedule will include the following:

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

The following is a sample bakery production schedule:

Task	Time	Notes	Baking requirements <i>Include oven temperatures and timer settings</i>
1			
2			
3			
4			
5			

Mise en place

Mise en place is a French term that is used in the commercial cookery industry to denote that 'everything is in place'. It refers to the advanced preparation involved in organising all the menu ingredients before the cooking begins. This practice is equally important in the baking industry and relies on the pastry chef's ability to carefully plan and analyse recipes and the production schedule in order to process, bake, finish and serve products in the minimum amount of time.

In practice this means:

- Reading and understanding the production schedule and recipes, from start to finish.
- Having all of your ingredients prepped and measured before getting started.
- Making sure the ingredients are the correct temperature.
- Preparing pastries and fillings in the correct sequence to ensure the elements of the product are ready for baking and / finishing.



Self-check questions

Activity 1.2: Check your knowledge

Read the questions carefully.

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

2. What is the purpose of a production schedule?

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

4. Why is it important to always make sure that mixer bowls, attachments and other mixing equipment is clean before use?

5. Explain the term *mis en place*.

A large, empty rectangular box with a thin purple border, intended for the student to write their explanation of the term 'mis en place'.



Collaboration

Activity 1.3: Personal hygiene and protective equipment

Your teacher will discuss the purpose of maintaining good personal hygiene and using the correct personal protective equipment (PPE) and clothing.

You will be expected to follow correct work health and safety and food safety guidelines throughout your time in the bakery.

1. Ensure you have on your correct uniform and can demonstrate to your teacher correct usage. Make any notes below:

2. List six personal hygiene practices food handlers should follow when working in the bakery.

Equipment

A key task within your bakery is to understand the purpose of all the equipment you will use for producing pastry products and fillings. 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, maintaining and reporting equipment malfunctions. You will learn more about this in Topic 9.



Tart tins by [Alex Loup](#) under [Unsplash licence](#)

Below is a list of equipment used in the bakery when producing pastry products and fillings. Place a tick next to the equipment and tools you use have used before starting this unit.

Equipment and equipment accessories

- | | | |
|--|--|--|
| <input type="checkbox"/> Industrial oven | <input type="checkbox"/> Industrial cook tops | <input type="checkbox"/> Microwave |
| <input type="checkbox"/> Industrial mixer and attachments (whisk, beater and dough hook attachments) | <input type="checkbox"/> Dish washing sinks, sinks, taps and accessories | <input type="checkbox"/> Deep fryer |
| <input type="checkbox"/> Gas or electric hot plates and attachments | <input type="checkbox"/> Pastry sheeter or pastry break | <input type="checkbox"/> Cool room, refrigerator |
| | | <input type="checkbox"/> Freezer |
| | | <input type="checkbox"/> Storage facilities |

Tools and utensils

- | | | |
|--|--|---|
| <input type="checkbox"/> Hand whisks | <input type="checkbox"/> Thermometers | <input type="checkbox"/> Electronic or analogue scales |
| <input type="checkbox"/> Fine or coarse stainless-steel wire whisk | <input type="checkbox"/> Sieves | <input type="checkbox"/> Knives |
| <input type="checkbox"/> Spoons | <input type="checkbox"/> Cannoli moulds | <input type="checkbox"/> Cook's knife |
| <input type="checkbox"/> Biscuit and pastry cutters | <input type="checkbox"/> Tart frames | <input type="checkbox"/> Paring knife |
| <input type="checkbox"/> Rolling pins | <input type="checkbox"/> Egg wash brushes | <input type="checkbox"/> Knife sharpening steels and stones |
| <input type="checkbox"/> Pastry cutters | <input type="checkbox"/> Piping bags and nozzles | <input type="checkbox"/> Peelers, corers or slicer |
| <input type="checkbox"/> Flour brushes | <input type="checkbox"/> Pastry brushes | |
| | <input type="checkbox"/> Measuring jugs | |

Ancillary equipment

- | | | |
|--|---|---|
| <input type="checkbox"/> Storage containers (dry and refrigerated) | <input type="checkbox"/> Ingredient storage bins | <input type="checkbox"/> Cooking pots |
| <input type="checkbox"/> Industrial baking tins, lids and pots | <input type="checkbox"/> Cooling wire racks | <input type="checkbox"/> Stockpots |
| <input type="checkbox"/> Pastry foils and tins | <input type="checkbox"/> Equipment used to melt chocolate | <input type="checkbox"/> Saucepans |
| <input type="checkbox"/> Pie tins and foils | <input type="checkbox"/> Containers used for storing fillings | <input type="checkbox"/> Blind baking equipment |
| <input type="checkbox"/> Baking trays and bowls | <input type="checkbox"/> Cutting boards | |

In the following pages we will explore some of the equipment, tools and techniques used in the main production processes for pastry products and fillings, including:

- Measuring ingredients
- Peeling and cutting tools
- Industrial mixers
- Rolling pins and industrial sheeters
- Preparation of baking trays for pastry production
- Industrial ovens

Your teacher will demonstrate how to use equipment correctly and safely. You will also have time to practice using equipment for pastry and fillings in the practical sessions of this course.

Measuring ingredients

Accurate measurements of ingredients is important to:

- Ensure products have a consistent flavour and texture.
- Minimise faults
- Minimise waste

The techniques for measuring ingredients is usually by weight; however, volume, count or estimation may be required in some bakery production schedules. Always use the recipe specification to guide the measurement of ingredients. We will explore the techniques and equipment used for measuring next.

Measuring by weight

Weight is a measure of heaviness, also known as mass. This is the main form of measurement used in the Bakery industry. All dry ingredients should be weighed (weight). Ingredients for fillings such as meat, vegetables and fruit may also measure by weight.

Equipment for measuring by weight: Scales



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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. Ingredients are weighed for a consistent size and to ensure the accurate baking times. Digital scales with one to five gram increments are commonly used in bakeries to help ensure accuracy.

Tip: Make sure your scales are in good working order and calibrated regularly. Level when in use and nothing is touching or leaning against the scales when in use, for example a bowl sitting against the scales.

For more information, refer to the standard operating procedure (SOP) in your workplace or the manufacturer's manual.

Measuring by volume

Volume is a measure of how much space an ingredient takes up. Liquid such as water, milk or vegetable stock may be measured by volume.

Equipment for measuring by volume



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Graduated measuring jugs should be used to measure by volume. Measuring cups and spoons are also used for smaller quantities, such as a water measurement to mix the initial paste when thickening fillings.

Tip: When using measuring jugs ensure the jug is on a level, stable surface.

Check the measurement at eye level to the graduation line (you will need to crouch down to take an accurate level), then adjust the liquid level according to the recipe specifications.

Measuring by count measure

Measurement by count refers to the measurement of whole items. It is only used occasionally in bakery production. This form of measurement is suitable when you are preparing fillings such as whole strawberries as a decorative or a fruit flan filling. The number or count of berries will depend on the size of the flan base.

Measuring by estimation

When adjusting a recipe, an estimation may be used for ingredients that do not scale up or down exactly, such as spices, salt, and thickeners. Fresh herbs may also be measured for garnishing such as a sprinkle of parsley or sprig of thyme.

Peeling and cutting tools

The information below outlines common tools and equipment used for peeling and cutting ingredients when preparing pastry fillings, as well as tools used for cutting and shaping pastry.



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Cook's or chef's knife

Also known as the French knife, this knife comes in a range of blade sizes from 15-36cm. It is an all-purpose knife used for dicing, slicing and shaping fruits, vegetables and meats.



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Paring knife

This is a short knife used for shaping, peeling, cutting or trimming fruit and vegetables. It may also be used for detailed work when trimming and shaping pastry or turning vegetables such as potatoes and mushrooms.



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Peelers

Used for peeling fruits and vegetables. Peelers can have a flexible or fixed blade. The most important aspect is to choose one with a stainless steel blade. There are cheaper (carbon steel) peelers available but will rust very quickly in the commercial cookery environment.



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Corers and slicers

Corers and slicers come in many different shapes, however their function remains the same – to remove the core from fruit, and slice fruit and vegetables.



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Mandoline

A mandoline is a cutting tool used to slice and cut vegetables and some fruits.

It can be used to create uniform cuts ranging from straight, crinkle to julienne and French fry cuts.

Safety tip: Ensure you have been trained prior to using the mandoline and that you follow the workplace standard operating procedures (SOP). If you are unsure ask your teacher or supervisor. The blades on the mandoline are extremely sharp. Always use the food holder when using the mandoline.



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Cutting boards

Plastic or nylon cutting boards are light weight and can come in an assortment of colours. The differing colours indicate its cutting use (e.g. blue for fish, green for vegetables and red for meat). This helps prevent cross contamination of food bacteria, a common cause of food contamination in the catering industry.

Many bakeries still only have the one colour and it will need to be cleaned and sanitised between the differing jobs to stop cross contamination.



Cookie cutters by [Counselling](#) under [Pixabay licence](#)

Cookie cutters

Used cut out various shapes of pastry. There are a wide variety of shapes, such as diamonds, hearts and stars, with a range of edges, such as plain or fluted.



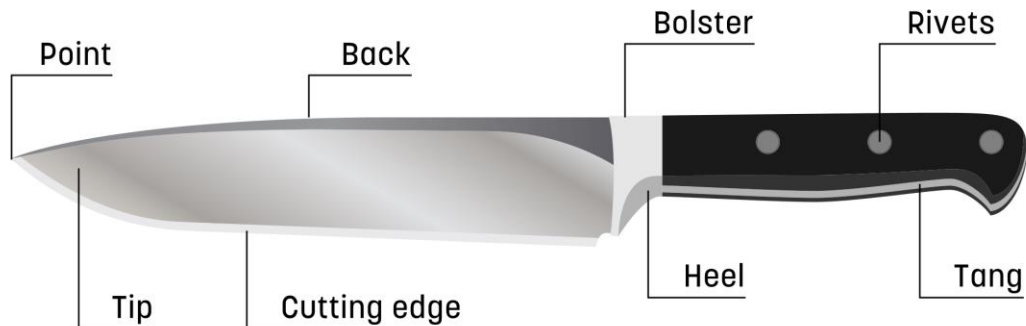
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Pastry wheels

A utensil used to cut pastry dough when it is being formed and shaped. The pastry wheels can be purchased as plain wheels or a single fluted wheel for a decorative effect, or as a double headed wheels with both a fluted and plain wheel.

Knives

PARTS OF A KNIFE



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The best French knives are forged from one piece of metal which is known as a 'full tang' knife. Most professional French knives have handles made of wood, plastic, or are all stainless steel. Your choice of knife should be determined by the comfort, balance and construction of each brand name.

Knife sharpening and handling

Knives must be handled with respect, used correctly and taken care of so that a professional performance can be achieved.

Blunt knives are often the cause of accidents as more pressure is required than if a sharp knife is used.

Sharp knives allow the work to be accomplished faster with less energy expended and with a much more professional result.

Sharpening knife tools and techniques

Knife sharpening steel

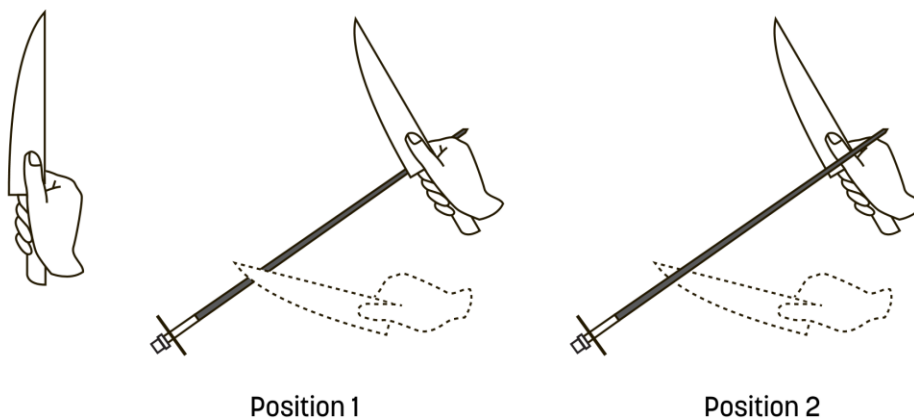


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A knife sharpening steel is used to hone the blades of your knives. The honing process re-centres your blade and straightens it. Honing does not actually sharpen your knife, it just appears that the knife has been sharpened. You should hone your knives on a regular basis.

Using a steel

A knife is honed by passing over the steel as shown below. The knife is gripped firmly as indicated and passed along the steel at an approximate 20 degree angle as shown in *position 1* below. Bring the knife into place again as shown in *position 2* and pass the blade against the far side of the steel. Half dozen strokes are usually enough to hone the edge.



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Knife sharpening stones



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A knife sharpening stone is used to create a new sharp edge on your blades through a grinding process that shaves off fine bits of steel. The stone has two sides, the coarse side for beginning; and a fine side for finishing.

You should only need to sharpen your knives on a stone a couple of times each year.

Using a sharpening stone

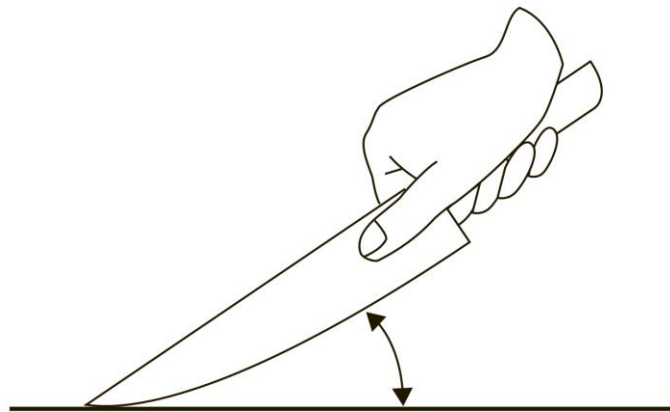
The stone should be moistened with water - do not use vegetable oil as this will make the stone gummy and sticky. The knife should be drawn over the stone in smooth strokes with very little pressure - again at about a 20 degree angle. Three or four passes on each side of the knife blade on both sides of the stone should give an acceptable cutting edge.

Learning to use knives and sharpening tools takes time and patience. You will learn more fundamental handling techniques next. Your teacher will also demonstrate knife sharpening and fundamental handling techniques in the practical sessions for this course and provide you with time practice.

Fundamental knife handling techniques

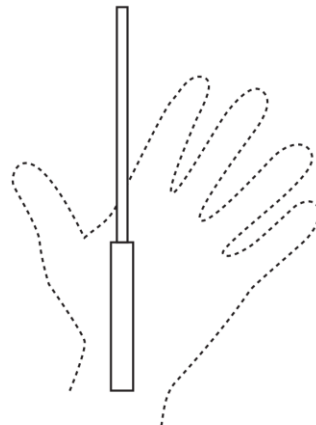
There are two fundamental techniques used with a French knife: the pivot point technique and free pass technique. You will need to practice these techniques before learning precision cutting techniques to prepare fruit, vegetables and meat pastry fillings.

1. The pivot point technique



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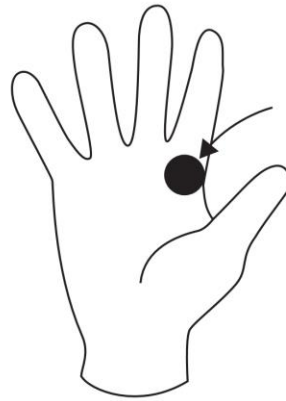
The point and tip of the knife is kept on the cutting board while chopping, serving as a pivot point as the heel of the knife is arched up and down in a chopping motion.



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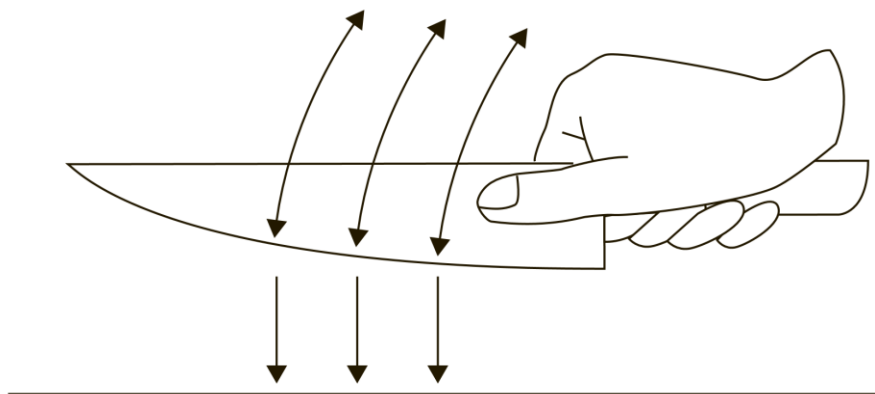
Note the grip of the French knife in this operation. The handle and bolster are completely gripped by the thumb and index finger for greater control and safety not found in other holds. This grip is unique to the French knife because of its large heel and bolster and should not be used for any other knife where the grip is on the handle only.

The inside of the hand at the base of the index finger should rest slightly above the handle. You will soon build up a callous there. The area may be tender for a short while but will toughen as the callous forms.



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2. The free pass technique



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In the free pass technique, the entire cutting edge of the knife is raised, allowing the pastry chef or baker greater freedom of movement for any part of the blade to be used. The area of blade used frequently depends on the product being worked with: its texture, hardness, size and shape.

Throughout this course you will learn slicing and dicing techniques to use when processing fillings. After practice and experience you will be able to decide the most suitable knife technique for the job at hand. You will notice in time that the greatest cutting power is achieved nearest the handle.

Safety rules for knife handling

- Never play around with knives
- If carried, the knife point must be held downwards
- Do not allow knives to project over the edge of benches or tables
- Use correct knife for correct purpose
- Always keep knives sharp
- Keep handle of knife clean when using
- Never leave knives in sink
- Only have one knife on the chopping board at a time

Tip: Cutting boards pots and pans

When using your knives you should always work on a cutting board. A hard surface such as a stainless steel bench will damage the blade or may cause the blade to slip resulting in a serious accident.

Cutting boards should be placed on the stainless steel bench with a damp cloth or paper towel under it to give it a firm hold.

Pots and pans and methods of cookery

Food is cooked to make it more eye appealing, improve the flavour and create a desirable smell.

The effects that cooking has on foods are:

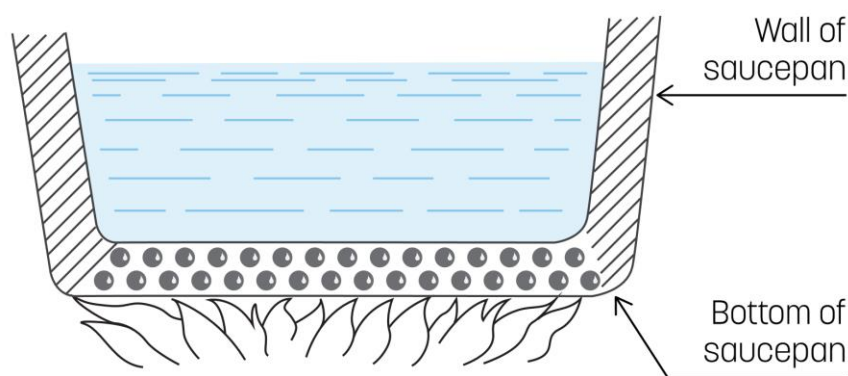
- **Sensory changes** - the colour, taste and smell of many foods will be altered during the cooking process.
- **Structural changes** - the connective tissue in meat will break down making it tender. In vegetables the cell structure softens to make it tender.
- **Nutritional changes** - these may be altered as a result of the cooking process.

Principles of cookery

The transfer of heat within food is usually by conduction, convection or by radiation. On commercial ovens, the gas rings are usually designed to heat large pans. When using a smaller pan on these stoves the flame needs to be adjusted so the flame is only high enough to heat the bottom of the pan. An incorrect flame is wasted energy, inefficient in its heating and dangerous for the chef.

Conduction

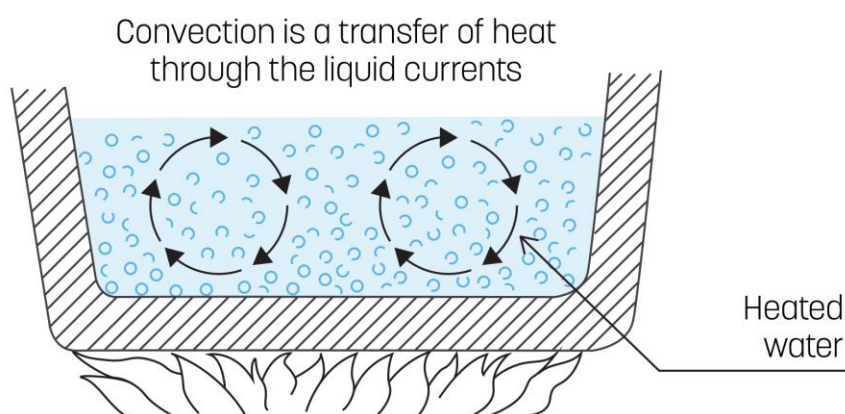
Conduction is the passage of heat through a solid, or from one solid to another provided they are in contact, for example a fry pan on a stove top or burner.



© TAFE NSW

Convection

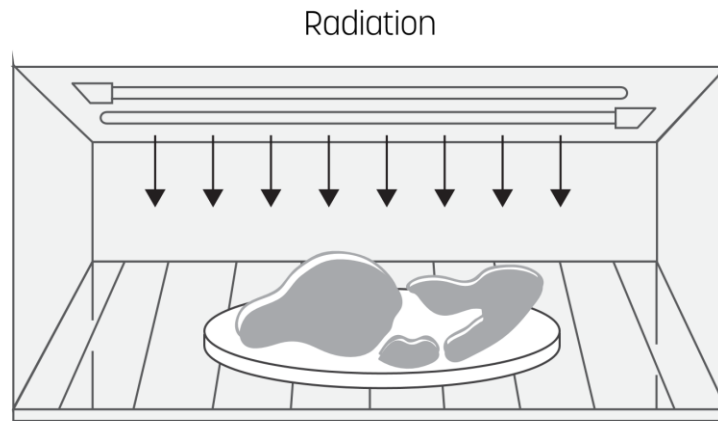
Convection heating is the passage of heat through liquid. Think of water in a saucepan, as the water at the base of the saucepan heats, it rises to the top because it is lighter and the heavier cold water takes its place at the bottom of the pan. Convection ovens use fans that circulate the hot air around the oven and is the same principle.



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Radiation

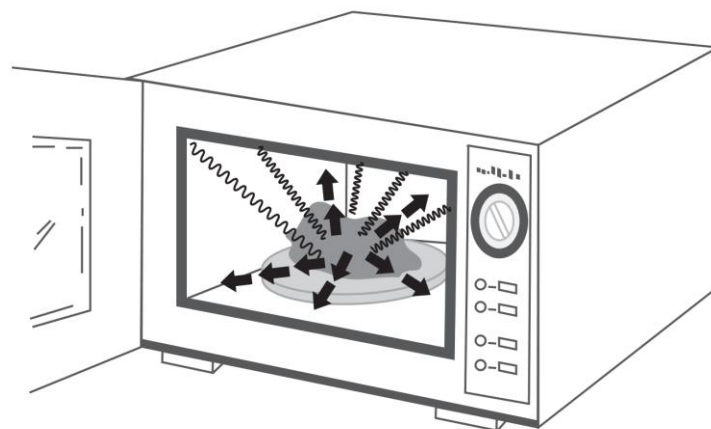
Radiation heating is the passage of heat in straight rays from a hot object. Radiant heat is the direct transfer of dry heat from a salamander or other heat source directly onto the food item.



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Electro-magnetic (microwave) radiation

Microwave radiation is created by a magnetron which uses electricity. The microwaves heat the food by rapidly moving the molecules of water within the food. This causes heat by friction which cooks the food. Only the food emits heat and the cooking container or plate the food sits on heats through conduction.

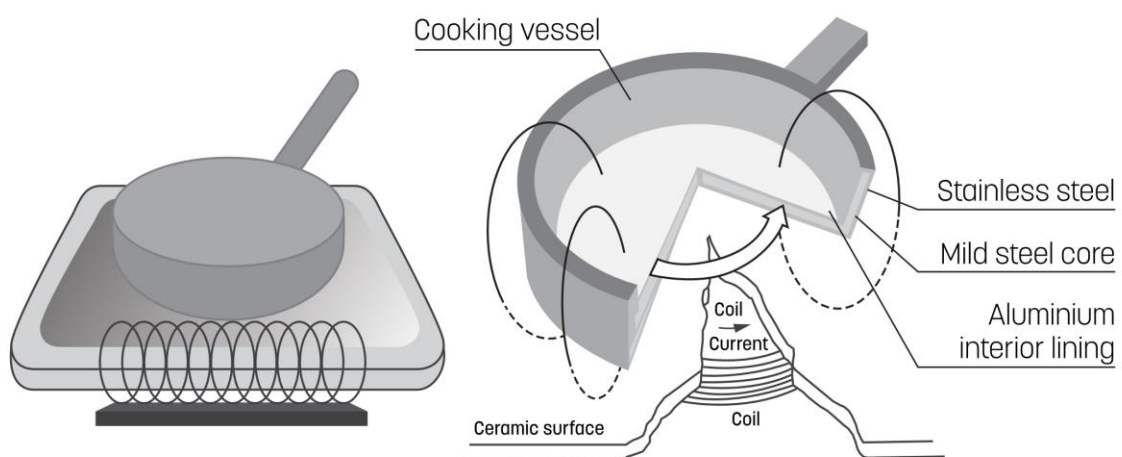


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Induction

Electromagnetic energy is used to heat cookware made of magnetic material (steel, iron or nickel). When the unit is turned on, the coils produce a high frequency alternating magnetic field, which heats the molecules of the metal pan causing the pan to get hot. The induction range is extremely energy-efficient and is 25-35% faster than gas. Once the pan is removed from the element, the heat source expires and cools almost immediately. The area around the pan does not become hot therefore accidents (burns and scalds) are reduced.

Pots, pans and the tools used in the preparation, cooking and serving of food are called utensils. Just as a pastry chef must select the correct knife to prepare the food, the selection of cooking pots and pans is just as important to complete the process and do the job well.

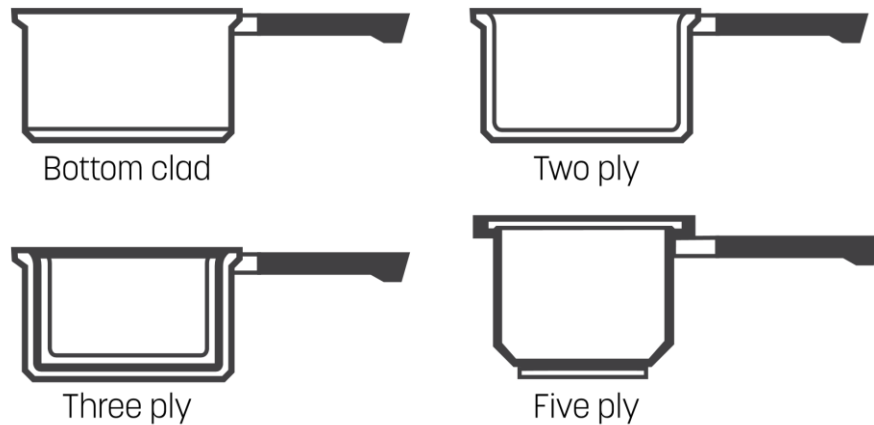


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Pots and pans

Bottom clad and ply construction

Most stainless steel pots and pans are made by combining the stainless steel with other metals, such as aluminium or copper, to improve the heat conductivity. The resulting combinations are referred to as two-ply, three-ply, and bottom clad utensils.



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Bottom clad pans are formed with copper or aluminium applied to the bottom of the stainless steel pan. Two-ply pans commonly have a stainless steel interior with another metal such as copper on the exterior. Three-ply pans have stainless steel on both the inside and outside with a layer of copper or aluminium forming the core. A variation of this construction is five-ply as shown.

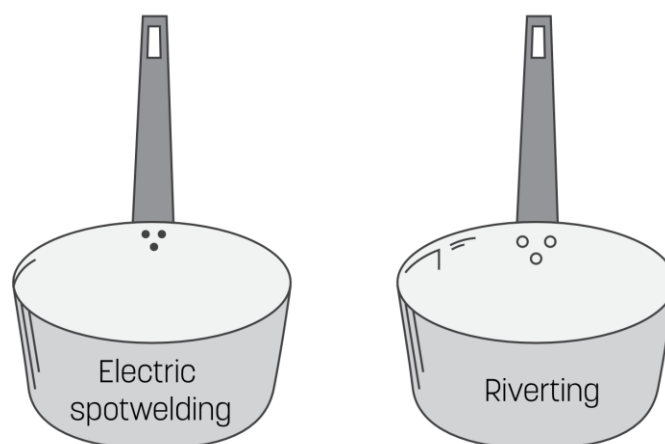
When purchasing pots and pans the chef should also pay attention to the construction of the handles. There are several joining methods which may be used.

Electric spotwelding

This is a satisfactory method for strength and cleaning. It is best used for smaller pots and pans in the commercial situation

Riveting

This method provides a secure joint but can interfere with the cleaning to some degree.



© TAFE NSW

The smoothest possible construction should be selected if purchasing such pans.

Soldering

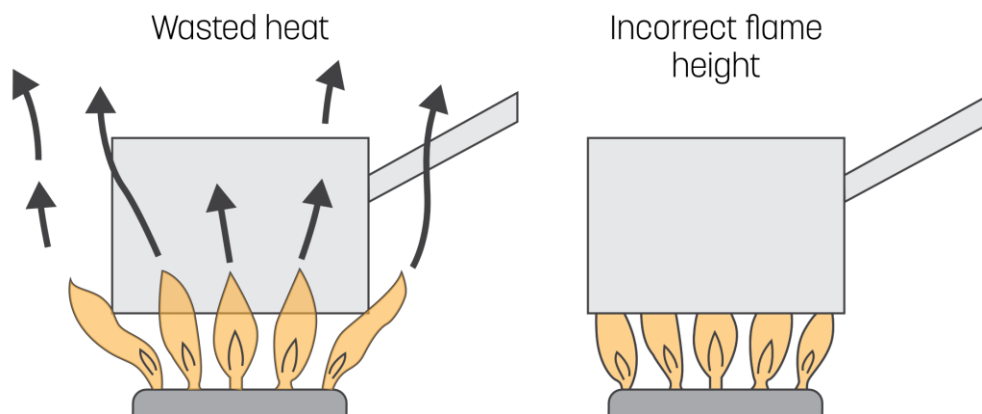
Generally not suitable for commercial pots and pans as the joint is less permanent.

Brazing

This results in joints that are very strong and is the preferred choice for commercial use. In this process two metals, such as stainless steel and copper, are joined by the use of a third metal such as an aluminium alloy.

Screws

Can be tightened if the screws become loose, but eventually the screw threads weaken and the handle needs to be replaced.



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Industrial mixer and attachments

The planetary mixer is the most type common industrial mixer used for producing pastry products. The whisk, beater and dough hook attachments are the main attachments used depending on the product being processed.

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

- Be given complete instruction on the correct and safe operation.
- Be supervised while using the machine at all times.
- Give full attention to ensure the correct and safe operation at all times. If in doubt, always ask your trainer to help you.

- Use all machines according to the manufacturer's recommendations to avoid damage to the machine and injury to the operator.

Safe use of industrial mixers:

- If you are not sure how to use the mixer ask your teacher or supervisor.
- Always use the mixer according to manufacturer's recommendations.
- Use clean, dry hands to operate the machine.
- Do not wear loose clothing when operating the machine.
- Keep hands clear of all moving parts.
- Only one person is to operate the machine at any one time.
- Use the appropriate mixing attachment for each type of mix.
- Make sure that the attachment and bowl are correctly secured before starting the machine.
- Do not remove or override any safety devices.
- Start all mixing on low gear before changing to a higher speed.
- Do not lean on the machine at any time.
- Do not use the safety guard to stop the machine, only use the off switch.
- After use, switch the machine to low gear.
- Wait until the mixing attachment had STOPPED MOVING before removing the safety guard and placing your hand in the bowl to scrape down or to check the mix.
- Remove the mixing attachment before placing your hand/s in the bowl for scraping down

To help avoid electrical hazards:

- Switch the machine **off** at the power point before attempting to clean it.
- **Do not** stand on a wet surface when operating an electrical machine.
- **Do not** allow water near the electric motor or switches.
- **Do not over load the mixing bowl** as this could cause the machine to stall and/or short circuit.
- 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 hazard to your teacher or supervisor.

Rolling pins and pastry sheeter

Rolling out of the pastry is usually done with either a rolling pin for smaller quantities or using a pastry sheeter for larger, or commercial quantities.

Rolling pins



Rolling pin by [Flockine](#) under [Pixabay licence](#)

Rolling pins are traditional tools used to flatten pastry dough to the desired thickness. Originally made of wood with a smooth finish - rolling pins are available in a variety of materials including silicone, plastic or aluminium, as well as a variety of textured finishes to leave an embossed decorative pattern on the rolled pastry.

The type of rolling pins used will be determined by the workplace requirements and the recipe specifications. As you develop your skills and techniques in pastry production you will also develop your personal preference for rolling pin selection.

Pastry sheeter

The pastry sheeter, also known as a dough brake or a pastry break, is an electrical machine used to roll pastry to the desired thickness. Pastry Sheeters are designed to sheet large quantities of pastry, saving time in the production processing.

The process of using a pastry sheeter to roll our pastry is called '*sheeting*'.



© TAFE NSW

How the pastry sheeter works?

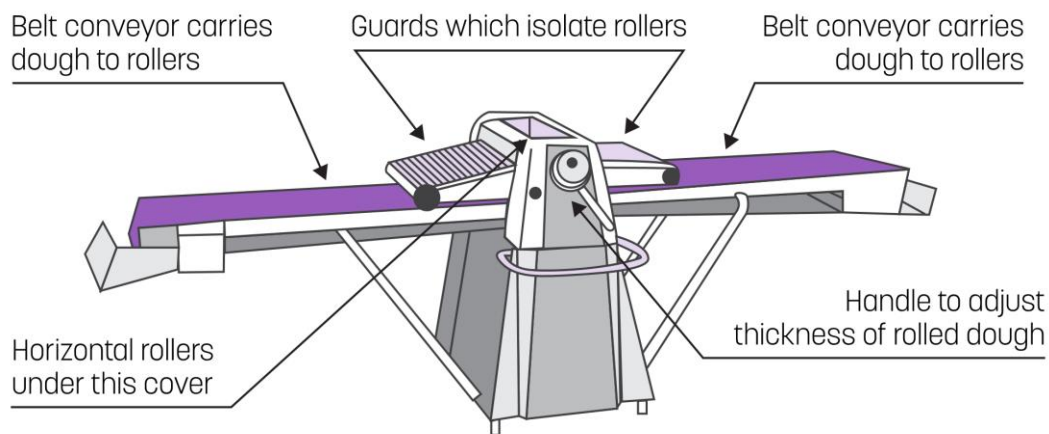
Two horizontal steel rollers roll the dough or pastry between them and then roll it again after the rotation is reversed. Between reversals, the distance between rollers is reduced to bring the dough or pastry to the required thickness. ([Work Safe New Zealand](#))



Collaboration

Activity 1.4: Using the pastry sheeter safely

The diagram below highlights the key components of the pastry sheeter. Your teacher will demonstrate how to use the pastry sheeter correctly and safely. Observe your teacher and answer the questions below.



© TAFE NSW. Adapted from: <https://worksafe.govt.nz/topic-and-industry/machinery/dough-machinery/dough-brakes/>

1. The pastry sheeter is an electric machine. From what you have already learnt about using electric machines list the safety tips that apply to the pastry sheeter? Example: Do not allow water near the electric motor or switches.

2. Use the table below to record the other potential hazards when using pastry sheeter and the actions you can take to control the hazards. An example has been added.

Hazard	How can you control it?
<i>Trapping in machine</i>	<i>Do not wear loose clothes or jewellery when using the machine.</i>

Industrial oven

The parts of the oven are as follows:

Part	Explanation
Thermostat	<p>A thermostat is a device which controls the temperature of the oven by regulating the flow of energy (heat) into the baking chamber. The baker uses the thermostat by setting a dial or digital display which is marked with the graduations of temperature in either °C or °F.</p> <p>The oven chamber can be controlled by the top and bottom heat settings.</p>
Damper (flue)	A damper is a small opening 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 at a time should attend the oven.
- If baking a small load (two trays in a four tray oven) you may need to reduce the baking temperature slightly.

- If products start to brown too quickly adjust top and bottom settings on the oven.
- When baking specialist pastry, keep the damper closed to retain moisture in the baking chamber.
- If the products are baking unevenly you may need to turn the tray during baking.
- Space products evenly on the tray for uniform baking.
- Double the trays to reduce the amount of bottom heat to prevent products from browning too much on the bottom and turn down the bottom heating element if adjustment is needed.
- Never use wet or badly worn oven gloves/mitts to handle hot trays.
- Where possible, avoid having to walk too far with a hot tray.
- Position a rack beside the oven for hot trays.

Preparation of trays for pastry production

Trays 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.

The reasons for papering the trays are:

- To insulate the pastry during baking.
- The pastry products are more easily removed from the tray.
- To maintain and protect the shape of the pastry.
- Improved hygiene – pastry can be handled without direct human contact.



Self-check questions

Activity 1.5: Check your knowledge

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

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

2. What is the damper (flue) on an oven and what does it control?

3. Describe how you can ensure knives are used safely in a bakery kitchen.

4. Name two pieces of equipment that you could use to sharpen your cook's knife?

5. Use the table below to describe the potential electrical hazards to be aware of when working with pastry cooking equipment and how would you control for them.

Equipment	Potential electrical hazard	Control
Mechanical pastry sheeter or pastry break		
Industrial mixer and attachments		

6. Use the table below list the most suitable way to measure each ingredient. For example, by weight using scales or by volume using a measuring jug.

Ingredient	Most suitable technique for measuring
Chicken for a chicken and mushroom pie filling	
Eggs to make custard	
Coriander for garnishing	
Vegetable for a pie filling	
Mixed berries for a decorative cold fruit filling	



Collaboration

Activity 1.6: Using bakery equipment

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

Scales – TARE, 1 gram increments, 5 gram increments

Check your scales are:

- clean
- on a level bench
- they turn on
- check increments — are they in 1 or 5 gram level increments?

Planetary mixer

Check your mixer:

- has the correct mixing bowl for the size of the mixer
- has the correct attachment
- is clean
- plugged-in and power on
- safety guard is in working order.

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

Deck oven

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

- top and bottom heat
- timer
- steam setting

- opening and closing oven door
- loading and unloading
- using oven mitts correctly

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

Additional resources

You can find additional information regarding your work health and safety obligations under work health and safety laws on the SafeWork NSW web site:

<http://www.safework.nsw.gov.au/law-and-policy/worker-and-visitor-obligations/worker-obligations>

Topic 2

Ingredients



Topic 2: Ingredients

In this topic you will learn about common ingredients used to produce pastry and fillings for pastry products.

You will learn about:

- The basic ingredients used to produce pastry dough and their function
- Types of ingredients used to produce fillings
- Checking the quality of ingredients
 - What to look for
 - How to recognise food spoilage
- Correct storage of ingredients according to food safety requirements

Basic ingredients used to produce pastry dough

Traditional basic pastry dough ingredients include flour, salt and water.

The function of these ingredients will vary depending on the type of pastry being produced.

In simple terms, the major function of:

- Flour is to provide the structure of the pastry product
 - Plain flour is used in short pastry to give it a short crumb
 - Strong flour is used in choux, laminated and extensible pastry as it contains more gluten which gives these pastry the elasticity required
- Salt is used to improve flavour of the dough
- Water is to bind the dry ingredients

We will explore these ingredients in detail in Topic 4, as well as fat and other ingredients unique to non-laminated, laminated and specialist pastry products.

Types of ingredients used in fillings

A trip to the local bakery will reveal many different types of cakes, breads and pastries that contain a wide range of fillings. As a multi-cultural society, Australia has benefited from having many influences and this has resulted in a diverse range of baked products with different fillings originating from all over the world being available.

The following table provide examples of types of ingredient used as fillings.

Fillings	Description
Fruit	Apples, pears, rhubarb, strawberries, lemons, apricots, plums, peaches, blueberries, nectarines, cherries, limes, figs, dates and a variety of dried fruit.
Vegetables	Potatoes, pumpkin, carrots, zucchinis, capsicums.
Dairy products	Fresh cream, imitation cream, mock cream/buttercream, a variety of cheeses and chocolate.
Meat and poultry	Beef, lamb, pork products, chicken and turkey.
Custard	Powdered custard, pastry cream (crème patisserie), egg custard (crème anglaise).

Product spotlight: Starch

Modified starches

Various starches may be purchased to withstand interaction with the other ingredients (such as the fat in the meat) and bakery processes, such as freezing. If the meat pies are to be frozen it is necessary to use a starch which is freeze-thaw stable in the meat filling, so that the gel will not break down when frozen and thawed, which occurs when using corn flour and other similar starches. Check with the supplier to make sure that you purchase a starch which is freeze-thaw stable.

Pre-gelatinised starch (instant starch or cold set starch)

This starch has been made by cooking it in a suspension of water and then drying it so that it becomes a dry starch again. Because it has been pre-cooked it will then gelatinise in cold water. It is ideal for thickening fruit pie fillings such as apple and apricot.

Checking the quality of ingredients

The quality of the ingredients will impact on the quality of your final product and reputation.

It is also a legal requirement that food business take steps to ensure it only accepts food *that is protected from the likelihood of contamination*. ([NSW Food Authority - Standard 3.2.2 Clause 3 \(5\) 1 of the Food Standard](#)). *The means you should ensure you use an approved supplier to purchase ingredients to help ensure a quality product.*

When ordering and selecting ingredients there is a range of factors to consider, including use by date, packaging and signs of food spoilage.

Quality: What to look for

When you are using packaged ingredients you should check the expiry date and packaging:

Use by date

Foods that must be eaten or used prior to a certain time due to health and safety reasons should be marked with a use by date. When choosing ingredients it is important to ensure the product is still within its use by date. If the use by date on the ingredient has passed, you should throw the product in the bin. When you are storing fresh perishable ingredients, they should be stored according to food safe conditions and marked with a use by date.

Packaging

Prior to using any packaged ingredients, you should be checking that the seals are still intact and there is no damage to the packaging. Additionally, you should also be checking the use by date. If the packaging is damaged or the ingredient is out of date, you should dispose of these ingredients.

How to recognise food spoilage

The information below outlines what to look for to ensure you are choosing the best quality ingredients for your fillings.

As your teacher discusses the correct storage for these ingredients record the ideal storage temperature in the space provided.



Fruits and vegetables by [Olga Maghi](#) under [Pexels licence](#)

Fruit and vegetables

- Looks fresh, good bright colour
- No bruising, minimal imperfections
- Ripe and firm to touch
- Pleasant odour
- No damage to packaging
- Within use by date if packaged
- Stored according to food safe conditions prior to use

Storage temperature:



Cream by [Byrev](#) under [Pixabay licence](#)

Dairy products

- Looks fresh, within use by date
- No damage to packaging
- Pleasant odour
- Stored according to food safe conditions prior to use

Storage temperature:



Three brown eggs by [Tookapic](#) under [Pexels licence](#)

Eggs (used for custard)

- Within use by date
- No damage to packaging
- Egg shells are free from cracks and damage
- Looks fresh
- Smells fresh
- Stored according to food safe conditions prior to use

Storage temperature:



Raw meat by [Rawpixel.com](#) under [Pexels licence](#)

Meat and poultry




- Looks and smells fresh
- No discolouration
- Stored according to food safe conditions prior to use
- Within use by date


Storage temperature:

Indicators of food spoilage

Now you have looked at what good quality ingredients should look like, we will now have a look at what the indicators of food spoilage are. When you are using fresh ingredients for your fillings the first thing you can check is how it looks, feels and smells. If it doesn't look fresh and has bruises or lots of imperfections, feels soft or old, and is emitting a foul or unpleasant odour then you should not be using it for your fillings.

The table below outlines what to look for to ensure you are not choosing poor quality ingredients for your fillings.

Ingredient	Image	Indicators of food spoilage
Fruit and vegetables	 <p>Rotten apple. © TAFE NSW</p>	<ul style="list-style-type: none"> • Discolouration • Bruising • Soft or mushy to touch • Mould • Unpleasant odour • Not stored according to food safe conditions prior to use • Expired use by date
Dairy products	 <p>Moulded cheese by NioyHarmony under Pixabay licence</p>	<ul style="list-style-type: none"> • Mould • Unpleasant odour • Curdling • Not stored according to food safe conditions prior to use • Expired use by date • Damaged packaging
Meat and poultry	 <p>Raw chicken legs by Lebensmittelfotos under Pixabay licence</p>	<ul style="list-style-type: none"> • Mould • Discolouration • Slimy • Unpleasant odour • Not stored according to food safe conditions prior to use • Expired use by date • Damaged packaging

Ingredient	Image	Indicators of food spoilage
Custard (eggs used for custard)	 <p>Cracked egg shell by Photobox under Pixabay licence</p>	<ul style="list-style-type: none"> • Mould • Unpleasant odour • Curdling • Discolouration • Cracked or damaged egg shell • Not stored according to food safe conditions prior to use • Expired use by date • Damaged packaging

Correct storage of ingredients according to food safety requirements

With perishable, products the longer it is stored the less useful the product becomes, and possibly the more unsafe it becomes. During storage there will be moisture loss, decay and bacterial actions, eventually completely spoiling the product. The storage temperature also affects these conditions. Regulated temperatures not only preserve the food products but also retard the ability of harmful bacteria to multiply.

The condition of the storage area is also very important. Storage areas should not be used to produce any food or this will attract insects, rodents and moisture could get into the ingredients. The storage area should always be kept clean and suitably ventilated with fresh air.

Tip: First In First Out (FIFO)

FIFO is the storage principle that should be followed for the selection and use of all food items. This principle can also be applied when storing finished products and perishable ingredients. This ensures that older ingredients are used before the new ingredients.

Storage of raw materials

Ingredients must be stored properly in the correct areas. Perishable ingredients such as meats and dairy foods, should be stored under refrigeration, and dry goods such as flour, sugar, milk powder and spices, should be stored in a cool, dry and well ventilated position.

There are three areas for food storage:

1. Dry
2. Refrigerated (0°C to 4°C)
3. Frozen (-18°C or below)

Temperature and humidity control is important in all three areas.

Dry storage

Dry storage is designed for foods that do not require refrigeration and have a long shelf life under existing environmental conditions. The goods stored here include tinned goods, flour, sugar, brown sugar, golden syrup, chocolate, and any item that does not need to be stored in a cold environment.

Refrigerated storage (cool room)

Ingredients that are perishable are stored in refrigerated rooms called cool rooms, or in a refrigerator unit. All dairy products, eggs, butter sheets and fresh fruit, as well as finished products containing crème patisserie and cream, should be stored at between 1°C and 4°C.

Freezer storage

Most commercial freezer storage is set at -18°C. Foods stored in a freezer include fruit, ice cream, cake batters, yeast leavened doughs, such as Danish pastries, and par baked goods. Goods stored in these conditions should be packed correctly to protect the product from freezer burn and physical breakages and dated to keep track of products being stored.

Storing food

Food Safety is paramount to all processes and products. Incorrect food handling and storage can cause major health problems and sickness.

General rules to follow for chilling, freezing, thawing and reheating of pastry products and fillings:

- All foods need to be wrapped or covered, labelled and dated. This will ensure that they will keep moist, no skin will form, or odour transfer into other foods.
- Cooked food should be stored above raw food to prevent cross-contamination. An ideal situation would be to have a cool room/cold storage for cooked food and a separate one for uncooked food.
- Thermometers must be used to check temperatures in storage areas.

- Shelving should be stainless steel and/or plastic, which is easier to clean.
- Do not store food products near the door of the cool room. When the door is opened the air closest to the door becomes warm and causes the food to spoil.
- Open the door for as short a period of time as possible. If the door is open for a long time the warmer air may cause the food to spoil.
- Thawing food from the freezer is safer and efficient if the product is placed in a refrigerator. This requires planning. If left to thaw at room temperature the outside of the product will become warm and therefore increase the chance of contamination by micro-organisms.
- Fillings and pastry products that contain potentially hazardous food (egg or meat dishes) must be cooled or reheated quickly so harmful microorganisms don't get a chance to grow to unsafe levels.

Freezing of pastry products

Freezing is the practice of maintaining the product in a completely frozen condition. Pastry products can be frozen at different stages. The different stages are:

- Products baked and ready for consumption —gourmet meat pies.
- Baked goods that need to be finished — biscuits, flans, tarts, éclairs and profiteroles.
- Partly baked products — flan shells and tartlet shells.
- Unbaked goods — gourmet pies, short pastry, puff pastry and choux pastry.

When freezing pastry products, a number of points can be taken into account, such as:

- Products can quickly become stale in a freezer if ideal storage temperature is not achieved quickly.
- Rapid freezing is important to stop the staling process.
- The rate of freezing of a product will affect the size of ice crystals that form in the product. Fast freezing will form small water ice crystals. Slow freezing will form larger water ice crystals. Larger water crystals may damage the structure of the product and also cause excessive moisture loss upon thawing.
- Dehydration will occur if the humidity in the freezer is low at the stage before the product is totally frozen.
- Freezer burn takes place if products have not been packaged properly. Freezer burn is where the exposed part of the product becomes dehydrated and loses moisture, affecting its colour and texture.

- Temperature of -20°C and lower is recommended for long term freezing.
- Temperatures of -15°C to -20°C are satisfactory for short-term storage.
- Fillings and topping should have freeze-thaw capabilities.
- If the product has been thawed, it is advisable not re-freeze the product because the level of harmful bacteria will increase in quantity and may spoil the product.

The benefits of freezing

Some of the benefits of freezing bakery products are:

- Full production can be maintained in normal working hours.
- Production can be spread more evenly over the working week.
- Surplus production can be frozen for future requirements.
- Freezing retards spoilage or staling.
- Products can be available at all times.

Methods of freezing

- To freeze bakery products, you can use freezer cabinets or walk-in freezer.
- Blast freezing chamber.
- Rapid freezing units, using liquid gas, these units freeze products in a matter of minutes.
- Combined frozen storage chambers and freezing units.



Practice activity

Activity 2.1: Storage

In the table below complete the storage requirements for the specialist pastry ingredients.

Choose from the following storage options: dry storage, cool room or freezer.

Ingredient	Characteristic	Storage
<i>Fresh cream</i>	<i>Liquid 35% fat content</i>	<i>e.g. Cool room</i>
Bakers' flour	10% gluten excellent flour to assist gluten development	
Unsalted butter	Low melting point, refrigeration and high skill required when incorporating into pastry	
Meat fillings	Starch based fillings using either minced meat or chunky meats	
Glazes	Can be pre-baked and post baked, egg wash	
Fruit fillings	Can be used post baked or pre-bake	



Self-check questions

Activity 2.2: Check your knowledge

Read the question carefully and refer to Topics 1 and 2. Your answer should be between 25-100 words.

1. When checking the quality of ingredients, what do you look for?

2. List three benefits of freezing pastry products.

3. What is FIFO? Why is it important?

Topic 3

Preparing fillings for pastry products



Topic 3: Preparing fillings for pastry products

In this topic you will learn about preparing fillings for produce pastry and fillings for pastry products. You will learn about:

- The variety of fillings used in pastry products
- Processing ingredients
 - Fruit
 - Vegetables
 - Meat
 - Dairy
- Cooking methods used to prepare fillings
- Storing fillings correctly including cooling, freezing, thawing and reheating

The variety of fillings used in pastry products

Fillings can range from cooked or fresh, sweet or savoury, to cold or hot, thickened or unthickened depending on the recipe specifications.



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They can also be applied either at the pre-baking stage or post baking stage. For example, when producing:

- Apple strudel the apple filling is applied to the pastry before baking, that is, at the pre-baking stage.
- Matches, a chocolate ganache and fresh strawberries filling, would be applied to the product after baking the pastry, that is, at the post baking stage.

The table below provides some examples of common fillings used in pastry products.

Ingredients	Filling type	Product
Fresh fruit filling	Unthickened fruit filled cold	Pear and frangipane tart
Fresh/dairy cream	Cold thickened (aerated)	Match
Starched thickened fruit fillings	Cooked cold thickened	Apple pie
Crème patisserie	Thickened cooked custard	Cannoli filling
Hot custard	Hot thickened cooked	Vanilla slice
Meat fillings	Cooked savoury thickened	Gourmet meat pies
Spinach and ricotta filling	Cooked savoury unthickened	Vegetarian sausage rolls
Chocolate ganache	Cooked cold	Salted caramel tart
Chicken and vegetable	Cooked poultry and vegetable filling	Gourmet pies

Preparing fillings

The key in the production of fillings is to ensure:

- Fillings are prepared in time for the assembling part of production. That is, they are at the correct consistency and temperatures to assemble the products.
- Fillings that are made in advance are stored in food safe containers to meet food safety standards.

The main processing steps used in the production of fillings are:

1. Selecting ingredients (Topic 2)
2. Measuring ingredients accurately to meet recipe specification (Topic 1)
3. Preparing the ingredients including using knives to make cuts
4. Blending and thickening of cold fillings
5. Blending and cooking hot fillings
6. Check fillings to identify faults
7. Cool cooked fillings to meet food
8. Storing prepared fillings to meet food safety conditions

We have explored selecting, measuring and storing ingredients in the previous topics.

In this topic we will explore steps 2 to 7 as well as the correct food safety practice for thawing and reheating fillings.

Preparing ingredients

Fruit, vegetables, meat and dairy products, such as custards and cream, are the main ingredients used in pastry fillings.

The following information provides an overview of how to:

- Prepare and process these fruit, vegetables, meat and dairy ingredients for fillings
- Cutting and slicing
- Cookery methods to cook fillings

Fruit filling

Fresh fruits and fruit fillings are popular in pastry products as they help to balance out the sweetness of the product. They can be used either as a fresh or processed product, can be poached and also add visual appeal to the product.



A variety of berries by [Public Domain Pictures](#) under [Pexels licence](#)

Clean and condition fruits to prepare for use

Fresh fruits need to be suitably ripe, well-shaped and free of bruising, blemishes and mould growth. Fresh fruits may need to be washed and allowed to thoroughly dry before coating with any required glaze or finish.

Most often tinned or frozen fruits or purees are used commercially. To extend the fruit and reduce the cost of the filling, often the fruit is blended with a sweetened gel made from water (or fruit juice), sugar and a starch as the thickener. The gel can be thickened with a hot set starch or a cold set (instant) starch. Using the hot set starch requires that the water be boiled and thickened with the starch, whereas cold set starch will gel in cold water.

Fruit pie fillings are also available ready made from suppliers, using the filling straight from the bucket. Pie pack tinned fruits may be used for fillings, whereas dessert quality tinned fruits would be more suitable for post bake finishing.

If using tinned fruits drain them well and remove all excess syrup. Tinned fruits should be well drained, and if necessary patted dry with kitchen paper to remove the syrup. This is necessary to make sure that the flan glaze adheres to the fruit, and that the juice will not soak into the pastry. Where necessary, and depending on the product you are creating, you may have to cut the fruits. Some pie pack fruit can be quite soft so it is important take care not to puree the fruit when mixing the filling.

Tip: Mixing modified starches and pre-gelatinised starch (instant starch or cold set starch).

When preparing fruit fillings you should ensure you avoid lumps from forming by mixing the starch with the sugar before adding to the fruit or water.

By blending the starch with the sugar and mixing through the water and/or fruit, the starch will gelatinise in the cold water. Heat is not required to make the starch gelatinise.

Vegetables

Vegetables are usually used in savoury pastry fillings as the main ingredient or as a supplementary ingredient/filler. There are many types of vegetables that may be used in fillings for pastry products, some common examples include potatoes, carrots, peas, corn, onions, tomatoes and spinach. The flavour of the end product will be affected by the choice of vegetables used - your recipe specification will guide your selection.

Fresh or frozen vegetables may be used and may be combined with other ingredients such as meat, poultry, cheese and spices to add flavour, colour, texture and variety. Vegetables are also used to add nutrition and bulk to meat fillings. Whatever selection is made, it is important to ensure the quality of the end product meets the customers' expectations.

Clean and condition vegetables to prepare for use

Most vegetables are grown in or close to the surface of the ground, and therefore special attention must be paid to the washing and cleaning of vegetables prior to their use for human consumption. It is important that all dirt, sand, insects and chemicals are removed.

Use the following procedures for washing and cleaning vegetables:

- All vegetables should be washed carefully in cold water
- Lettuce, silver beet, spinach and other leafy vegetables must be washed several times to ensure all traces of sand or dirt are removed
- Root vegetables also need thorough washing prior to use
- Broccoli and cauliflower may be soaked in salted water to kill any insects present

Peeling and trimmings

After washing vegetables they may need to be peeled and trimmed.

- **Peelings** refer to the outer skin of the vegetables, top and tails of beans, and root ends of carrots or parsnips. They usually have no culinary use and can be discarded.
- **Trimnings** refer to the off cuts when producing precision cuts or the usable parts left when turning potatoes and the like. Root vegetable trimmings can be used in stock production sauces, mirepoix or purees. Potato trimmings can be used for producing potato recipes requiring a mash or puree.

Cutting of vegetables and fruit

There are many ways to cut vegetables and fruit, including:

- Crushing used for garlic
- Slicing used for fruit and vegetables
- Chopping used for herbs
- Dicing used for precision cuts fruit and vegetables

Your teacher will demonstrate how to prepare and cut fruit and vegetables for fillings including peeling, slicing and dicing.

Notes:

Cooking fruit and vegetables

When making sweet or savoury pies, fillings can be cooked before the pastry product is assembled and baked. This helps ensure:

- The filling is adequately cooked and safe for consumption.
- The pastry does not cook before the filling is cooked.
- The water content of the fruit and vegetable is reduced. Fillings with a high water content will spoil pastry during baking.

Meat fillings

There are a range of meat products that can be used as pastry filling or as a topping, including beef, pork, goat, lamb and poultry (chicken, turkey and duck). Meat will usually require cooking prior to being added to the pastry dough.

Meat can be minced, diced or sliced into small pieces for use in the pastry product. It is often combined with vegetables and gravy bases as fillings. For example gourmet beef pies or chicken and mushroom pies. It is important to ensure you use separate cutting boards when preparing meat and that they are cleaned and sanitised after use.

Food safety tips for cooking meat

- Under cooked meat, poultry and other foods can be very dangerous.
- Raw meat and poultry can contain harmful bacteria, including Salmonella, Listeria, Campylobacter and E. coli that can cause [food poisoning](#).
- Fortunately, these harmful microorganisms can be destroyed by cooking food to the correct temperature.

Different meats require different cooking temperatures to destroy harmful bacteria. For example, a steak need only be seared on the outside and can be rare inside, while minced meat must be carefully cooked to destroy bacteria. That's because minced meat has far greater surface area than steak and the inside has been exposed to the atmosphere and is therefore at greater risk of bacterial contamination.

One way is to simply cook minced meat, sausages and poultry right through to the centre. No pink should be visible and juices should run clear.

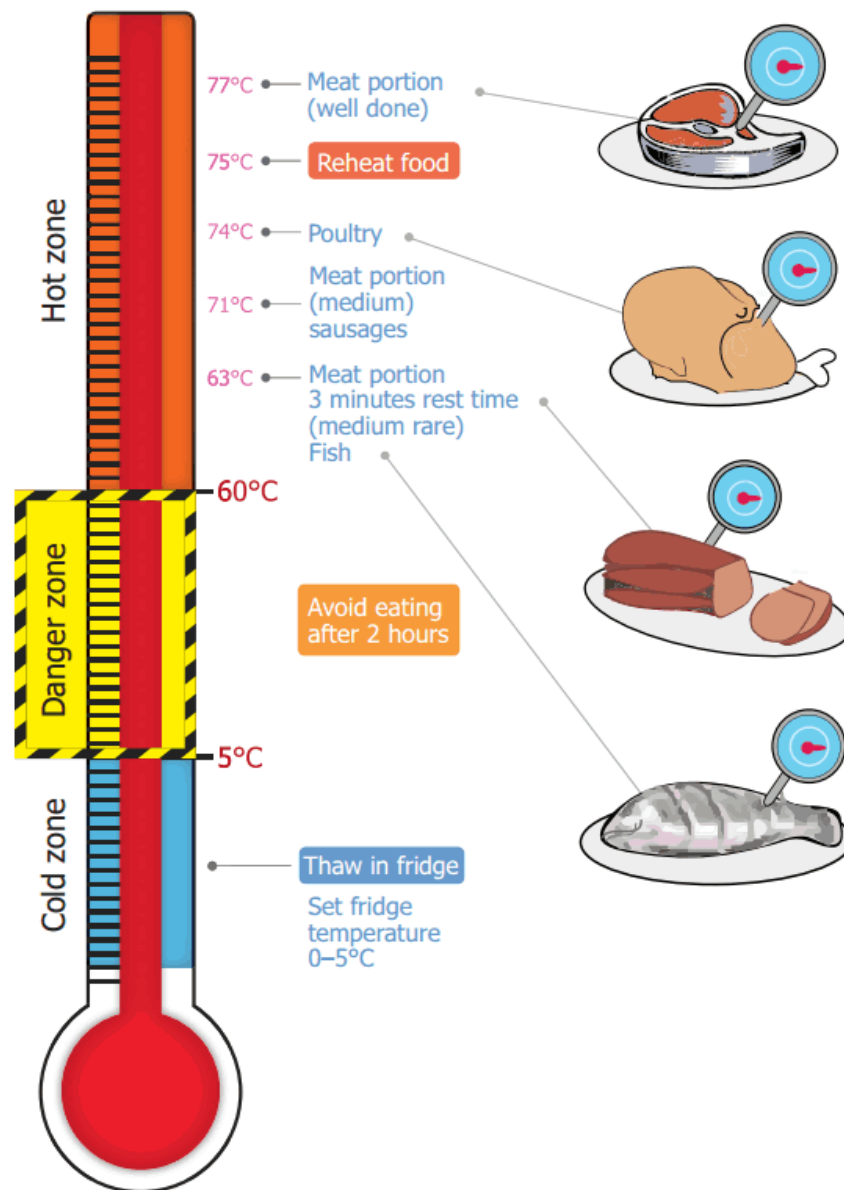
Using this method should ensure your meat and poultry is free from harmful bacteria, although what constitutes "pink" and "clear running juices" might differ from person to person, and colour is not always a reliable indicator. It's a good idea to invest in a food thermometer and use it.¹

Using a thermometer

According to the NSW Food Authority guidelines you can minimise the potential danger of cooked meat by cooking it properly (see below). The use of a food thermometer will help make sure meat fillings are cooked and reheated to the correct temperature.

¹ NSW Food Authority, 2018: <http://www.foodauthority.nsw.gov.au/foodsafetyandyou/food-at-home/cooking-temperatures> (accessed 25/02/2019)

Your teacher will demonstrate the correct way to use thermometers and you will have the opportunity to practice this in the practical sessions for this course.



Copied Under s113P, NSW Government Food Authority (Online), Cooking temperatures: Cooking meat & poultry
http://www.foodauthority.nsw.gov.au/_Images/foodsafetyandyouContentImages/thermometer.gif (accessed 01/03/2019)

Blending and cooking fillings

Blending and cooking the ingredients for the fillings involves mixing them in the correct sequence - the recipe specifications will detail the sequence and blending techniques that should be used.

Cooking methods

There are a range of cookery methods used to prepare cooked fillings, including boiling, simmering, shallow frying, pan frying, sautéing and microwaving.

Boiling

Is the method of cookery where food is completely immersed in liquid and cooked at boiling point 100 °C. Example, meat and vegetable pie fillings, hot custard fillings.

Simmering

Simmering is not a cookery method but a more gentle form of boiling. Foods are cooked in gently boiling water at around 95-98°C. Example: more fragile fruit such as berries.

Pan frying

Is where food is cooked in a small amount of fat and turned with a palette knife or tongs.

Sautéing

Involves tossing food in a small amount of hot fat to colour and seal. Sauté comes from the French word 'to jump'. Example: onions and garlic may be sautéed as the initial stages of processing a savoury filling.

Shallow frying

Shallow frying is the principle of cookery where food is cooked in a small amount of fat in a pan. This also includes pan frying, sautéing and stir frying. It is used for sautéing onions, leeks, browning/sealing diced meat, cooking mincemeat.

In shallow frying the purpose is to brown the food giving it an attractive colour and improved flavours. The item should have a crisp surface, due to caramelisation of the proteins, starches and sugars. The interior should remain moist and flavoursome. In some instances, one may shallow fry at a lower temperature in order to sweat rather than brown, as is the case with mirepoix (a diced vegetable mixture), by cooking in butter or oil or other fat, for a long time on a low heat without colour or browning. For example, lamb, pork, chicken and beef for gourmet meat and vegetable pies.

Shallow frying can be done in clarified butter, lard, dripping or vegetable oil. Mildly flavoured oils are best, in Mediterranean dishes olive oil is used to impart flavour. Other flavoured oils may also be used, such as chilli, cumin, saffron or garlic. The amount of fat required should be just enough to prevent the food from sticking to the pan, prevent dry foods from burning and to ensure the heat is distributed to all surfaces of the item being fried.

The temperature of the fat should be hot enough to seal the foods and avoid sticking to the pan, but not so hot as to burn the item. Blue smoke is an indication of very hot fat. Items lowered into fat should sizzle.

Microwave cookery

Microwave ovens use the principle of cookery where energy is transferred to the food by electromagnetic radiation. The microwaves activate the water molecules or particles of food and agitate them, causing heat by friction which cooks or reheats the food.

Microwaves can be used to melt chocolate, cook vegetables and reheat foods. It is also a safe way to defrost hazardous foods, such a chicken and meat.

There are advantages and disadvantages in using microwaves.

- Advantages include energy efficiency, speed of cooking, safe defrosting or reheating, economy with labour and electricity, 24-hour self-serve availability and minimal food shrinkage and drying.
- Disadvantages include the unsuitability of some food items, being able to only use a small quantity at one time, certain models don't brown foods and, finally, not all containers are suitable for use in a microwave, such as metals, aluminium foil and some plastics.

Microwave safety

- Door seals must be kept in good condition
- Should not be operated when empty
- Some foods need to be pierced in order to avoid bursting (eggs, potato, apples)
- Need to be regularly inspected for leakage or malfunction

Your teacher will demonstrate the preparation of a range of filling and you will have time in the practical sessions of this unit to practice and develop your skills and techniques.

Your teacher will demonstrate how to process meat, fruit and vegetables for fillings including poaching, boiling, shallow frying and microwaving.

Notes:

Dairy

Custard based fillings

Crème patisserie

This is the French version of boiled English custard creams and fillings. A crème patisserie (also spelt crème pâtissière) is made up of milk, eggs (either whole or yolks only), sugar, butter, flour or cornflour and vanilla essence. Crème patisserie is the base for German buttercream. It is used also in fruit flans, mille-feuille and may be used as an alternative filling in cannoli instead of ricotta cheese.

Crème patisserie is the base for three other fillings:

1. Crème diplomate: Crème patisserie with crème Chantilly folded through.
2. Crème dousseline: As already mentioned above, it is crème patisserie whipped with butter, also called German buttercream.
3. Crème chiboust: Crème patisserie with Italian meringue folded through it. Sometimes gelatine is added as a stabiliser. Crème chiboust is the traditional filling for a gâteau St. Honoré.

Fresh cream

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

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

Fresh dairy cream

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

Advantages and disadvantages of dairy cream include:

Advantages	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 gives the cream stability.

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

Mock cream

This is processed in the bakery and is made from icing sugar, sugar syrup and vanilla essence. It generally 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.

Aerated fresh dairy cream

What happens when fresh dairy cream is whipped?

As it is whipped, air bubbles are incorporated into the cream. Each bubble is surrounded by a watery film, containing fat droplets. This film is stabilised by protein absorbed by the fat globules and on the surface between film and air. As whipping continues, the air bubbles divide and become smaller and more numerous, as the fat globules tend to clump together. The final result is an air-in-water foam in which the fat is partly solidified. The combination of absorbed proteins and semi-solid fat stabilises and strengthens the bubble walls and stops them from collapsing. Further whipping or churning will cause all the fat globules to come together, and the liquid to escape, creating butter.

Fresh dairy cream must be whipped when cold, preferably using a refrigerated bowl and whisk. Under no circumstances should you use warm equipment (fresh from being washed in hot water) to whip cream. If you do, the fat globules will come together sooner, creating butter.

Cream is perishable and must be stored in the refrigerator. It also has a short shelf life and must be consumed within a few days.

A cream stabiliser may be added to improve the stability of the cream and is added to the cream when it is whipped.

Storing fillings correctly including: cooling, freezing, thawing and reheating

As discussed in Topic 2, food safety is paramount to all processes and products. Incorrect food handling and storage can cause major health problems and sickness.

Pastry and pastry products often contain what is known as potentially hazardous foods, that is *“food that has to be kept at certain temperatures to minimise the growth of any pathogenic microorganism that might be present in the food or to prevent the formation of toxins in the food.”*²

Hazardous foods are often moist with a neutral pH level. Examples include:³

- raw and cooked meat or poultry or products containing meat and poultry, such as meat pies, sausage rolls and pasties
- food containing raw or cooked eggs, such as mousse, quiches
- dairy products and foods containing dairy products, for example milk, dairy-based desserts, bakery products filled with fresh cream or with fresh custard
- seafood (excluding live seafood) and foods containing seafood and sprouted seeds, for example sushi, beans and alfalfa
- prepared fruits and vegetables, for example cut melons, salads and unpasteurised juices.
- cooked rice and both fresh and cooked pasta

² NSW Food Authority, 2008:

http://www.foodauthority.nsw.gov.au/_Documents/scienceandtechnical/potentially-hazardous-foods.pdf (accessed 25/02/2019)

³ NSW Food Authority, 2016: <https://www.foodstandards.gov.au/publications/Documents/Safe Food Australia/Appendix 1 - Potentially hazardous foods.pdf> (accessed 25/02/2019)

[Standard 3.2.2, Clause 7 \(3\) of the Food Standard code](#) highlights the importance for businesses handling potentially *hazardous food correctly* (see extract below).

Standard 3.2.2, Clause 7(3), Food Standards Code⁴

A food business must, when cooling cooked potentially hazardous food, cool the food:

- *within two hours – from 60°C to 21°C and*
- *within a further four hours – from 21°C to 5°C,*

unless the food business demonstrates that the cooling process used will not adversely affect the microbiological safety of the food.

Guideline for cooling, freezing, thawing and reheating cooked fillings

Cooling

When cooking large batches of cooked filling it is important to cool the filling down quickly.

This can be achieved by:⁵

- cooking and cooling smaller amounts or portions of food
- placing food into large shallow containers to cool (5cm deep container)
- using rapid-cooling equipment (blast chiller)
- stirring liquid foods frequently (ensuring the stirring utensil has been cleaned and sanitised)
- using water or ice water baths
- allowing cool air to circulate around the container of food to be cooled

Once cool, fillings can be used to complete the pastry products or packages for storing in the cool room or freezer.

⁴ NSW Food Authority, 2018:
http://www.foodauthority.nsw.gov.au/_Documents/retailfactsheets/cooling_potentially_hazardous_food.pdf
(accessed 25/02/2019)

⁵ NSW Food Authority, 2018:
http://www.foodauthority.nsw.gov.au/_Documents/retailfactsheets/cooling_potentially_hazardous_food.pdf
(accessed 25/02/2019)

Fillings should be stored in food safe containers and labelled with the name of the filling and date (production and freezing date). Avoid cross contamination by placing cooked food above any raw ingredients in the cool room.

When placing them in the cool room follow the FIFO.

Temperature: Between 1°C and 4°C.

Freezing

- When packaging food for freezer, cover or wrap and label.
- Freeze food in small quantities to ensure food is frozen quickly.
- When placing them in the freezer follow the FIFO.
- Fillings should be stored in food safe containers and labelled with the name of the filling and date (production and freezing date).

Temperature: Most commercial freezer storage is set at -18°C

Thawing

- Fillings should be thawed in the cool room or using the microwave.
- Never leave the frozen food on the bench to thaw – the bakery room temperature is in the danger zone.

Reheating

Fillings should be reheated rapidly to a temperature of 60°C or above.

Quality of fillings

The quality of prepared fillings is characteristics by the texture, consistency and flavour.

Texture – related to the mouth feel of the filling.

- Cold gel based fillings should be smooth and free of lumps. For example apple fruit filing made with a pre gel starch.
- Hot meat and vegetable fillings should have a balanced texture, achieved by using the correct ratio of meat and vegetables.
- Hot custard and other starch based fillings should be smooth and free from lumps.

Consistency – describes the thickness or viscosity of the fillings. It can also refer to the consistency of the final product.

Flavour – refers to the taste of the fillings and is closely related to texture and consistency.

- Flavours should be balanced to complement the pastry product being produced.
- Herbs and spices should be used sparingly to enhance the finished product.
- Sweet fillings should not be too sweet.
- Savoury fillings should not be too salty or spicy.
- Faults in fillings can range from being undercooked and overcooked.

Faults in texture, consistency and flavour may be a result of:

- Using incorrect ingredients
- Using incorrect quantities of ingredients
- Ingredients being undercooked or overcooked.

For example, a thin runny starch based gel may be a result of too little starch being used or the mixture not being cooked long enough for the starch grains to gelatinise.

Reporting and rectifying faults

Any faults identified in fillings should be reported to your supervisor immediately. This should help:

- Prevent inferior fillings being used to produce finished pastry products.
- Give you the opportunity to determine if the fault can be rectify before the fillings are used.
- Minimise waste.

Steps taken to rectify faults should be recorded on the production schedule or according to the workplace requirements.



Self-check questions

Activity 3.1: Check your knowledge

Read the question carefully and refer to Topics 1 and 2. Your answer should be between 25-100 words.

1. Describe three cookery methods used to make fillings. Give two examples of the types of fillings made using each method

2. Outline the time and temperatures for the ingredients listed in the table below

Process	Time guidelines	Temperature
Thawing frozen chicken thighs		
Reheating meat filling		
Cooking chicken thigh		
Cooling of cooked meat filling		

3. What is a hazardous food? How should you handle hazardous food when preparing fillings?

4. Visit the [Standard 3.2.2, Clause 7 \(4\) of the Food Standard](#) and read what a food business must do when reheating potentially hazardous food that has been previously cooked and cooled. In your own words record the meaning of this statement using the space below.

5. List three types of faults that may occur when preparing fillings? Describe the actions you can take to minimise the faults listed.



Practice activity

Activity 3.2: Product research – mille-feuille

You are required to research mille-feuille and find out the following:

- History of mille-feuille
- The type of pastry used to make mille-feuille
- Common finishing of mille-feuille
- Common fillings and examples used in mille-feuille
- Find at least two images of mille-feuille

Write your notes about mille-feuille below.

Topic 4

Pastry dough



Topic 4: Pastry doughs

This topic is about how you mix a range of pastry doughs. You will learn about:

- Production scheduling considerations and techniques
- Pastry categories and types
- Mixing pastry doughs – overview
- Industrial mixers
- The characteristics of a pastry doughs including:
 - Short pastry
 - Puff pastry
 - Choux
 - Extensible
- The function of ingredients for each type of pastry dough
- The mixing and processing methods used when producing each type of pastry dough
- Checking pastry dough to identify faults and rectifying them
- Preparing and transferring pastry dough for storage as required in accordance with food safety requirements

Types, ingredients and mixing processes

Production scheduling

Regardless of the type of pastry you are producing it is important to confirm the production schedule and ensure you have an understanding of the following points before mixing ingredients.

The table below lists some of the considerations and techniques when developing a pastry production schedule.

Considerations	Techniques
Timings	<ul style="list-style-type: none"> • Timing differences for cooking times for puff pastry, short pastry and strudel dough • Filling orders for customers based on competing production requirements • Time required for each step in the production and the total production including time needed in oven, time resting dough and storage
Product processing requirements	<ul style="list-style-type: none"> • The mix process being used as well as the time, equipment and space required • Fillings available for use • Equipment - oven capacity, equipment availability, bench space
Volume requirements	<ul style="list-style-type: none"> • Calculating yield and adjusting recipes to meet required production volume • Mixer capability - how much can the mixer process effectively • Equipment availability - whether you use a dough sheeter or rolling pin (smaller volume) • Use of minor equipment - how many tins, space in your oven, storage space, cool room
Minimising waste	<ul style="list-style-type: none"> • Recipe reformulation to minimise waste - calculating from master recipe • Measuring ingredients for mixing process accurately • Mix ingredients in the correct sequence to minimise faults and waste
Finishing requirements	<ul style="list-style-type: none"> • Pre-bake finished product or post-baked finished product (for example, meat pie will be oven-finished but other products e.g. vanilla slice needs to be cooled, filled and glazed, portioned, cut and packed after oven finish) • Post baking space for finishing and storage • Packaging required
Bake parameters	<ul style="list-style-type: none"> • Availability of oven space, temperature of ovens, baking times

Use the space below to record any other considerations or techniques you use in production scheduling.

Pastry types

Pastry products incorporate both laminated and non-laminated pastry products as well as extensible specialist doughs. It is important that you know the difference and what products each type of pastry will produce.

The following outlines the main categories of pastry, the types of pastries doughs in each category and product examples.

Laminated



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Cannoli by [solci_109](#) under [Pixabay licence](#)

Sweet short, savoury short, choux pastry.

Extensible, cannoli and strudel dough.

Non-laminated



Mini vol-au-vent by [Jereskok](#) under [Pixabay licence](#)



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Puff pastry

Filo pastry

Mixing pastry doughs

The mixing process is the step-in production where ingredients are blended in the correct quantities and sequence to achieve the desired outcome.

The mixing processes in pastry production may be defined by the method used to incorporate the fat into the dough mixture (see table below). These methods give each type of pastry their unique characteristics.

We will explore these methods and the characteristics of pastry dough in this topic. Your teacher will also demonstrate these methods and you will have time to practice them in the practical sessions for this unit.

Non-laminated	Laminated
Rub-in (crumbing) or sugar batter method	French method (puff)
Boling method (choux)	English method (puff)
All in one (extensible)	Scotch method (puff)

Common mixing method

The three laminated puff pastry methods (French, English and Scotch) share a common initial mixing processing known as detrempe (French). This is the first stage of puff pastry production where flour, water and salt are mixed together and slightly developed to form a smooth dough, before incorporating the fat.

The detrempe, rub-in and sugar batter mixing methods can be mixed by hand or by using a planetary mixer, depending on the size of the production run and the equipment available in the bakery. Whatever method is used always, start by making sure you have the right ingredients, in the correct amounts and preferably, in the order you will need to add them when mixing.

Industrial mixers

Loading ingredients into a mixer in the required sequence

Mixing ingredients in the correct sequence as outlined in the recipe specification is a critical part of mixing pastry dough. This will assist in reducing faults in the texture, form, taste and appearance of the final product.

When using an industrial mixer to mix pastry dough it is important to ensure:

- The correct attachment is used for the dough being made.
- The bowl of the mixer is the correct size for the production volume. If not, you will need to change the bowl/mixer being used. If this is not possible you will need to recalculate the recipe specifications to make smaller batches. If you are not sure, check with your teacher or supervisor.
- The mixer is clean, dry and free from any debris or foreign particles prior to commencing the mixing process.
- You ask for assistance to lift and load any large quantities of ingredients into a mixer.

Operating and monitoring a mixer to mix pastry doughs

It is important - as with all machinery - that you operate it with the appropriate:

- Personal protective equipment (PPE) to prevent injury (such as strains, burns, cuts, eye injury or machinery injuries).
- Training to show you how to safely and correctly operate the machinery.
- Follow the standard operating procedure (SOP).

It is also important to monitor mixer machinery during processing to ensure correct mixing of your pastry products, and to be able to intervene quickly in the event of any product or machinery faults or problems.



Practice activity

Activity 4.1: Safety revision

Review the safety tips for using an industrial mixers and attachments in Topic 1. Use the space below to create your own safety checklist for using an industrial mixer in the bakery.

Process spotlight: Resting dough

You will learn about several mixing methods for pastry, both sweet and savoury. One thing that will generally apply to all pastry and dough is that it will need to rest prior to using it. It is very unusual to use a pastry or dough immediately after it has finished being mixed.

Resting pastry requires you to cover it in cling or plastic to prevent a skin from forming and storing it in the coolroom for approximately 30 minutes, or in the case of extensible dough – 24 hours. It is important that you allow the pastry to rest at various stages of processing to allow the gluten relax and lose some of its resistance to rolling. This process will also help minimise the risk of shrinkage of the pastry during baking

Short pastry

What is short pastry?

Short pastry is a non-laminated pastry, also known as shortcrust and shortbread.

The term 'short' refers to the description of the short gluten strands in the pastry. Short gluten strands are achieved in the mixing processes used when producing short pastry. By incorporating the butter with the flour before adding other liquid, the flour is coated with butter, retarding gluten development.

The result is a pastry which can easily be crumbled or broken between your fingers and breaks apart easily when chewed. Some of the richer short pastries are extremely 'short eating' and crumbly, making them fragile and requiring carefully handling for finishing and packaging to not damage them.

There are basically two types of short pastry:

1. Sweet short pastry
2. Savoury short pastry

Examples of the types of bakery products made from short pastry are listed below:

Sweet short pastry	Savoury short pastry
Berry tart	Base for gourmet pies
Pear and frangipane tart	Pastry cases for savoury fillings
Apple pie	Salmon and dill quiche

Sweet short pastry	Savoury short pastry
Salted caramel tart	Quiche Lorraine
Salted caramel slice	Quiche Florentine
Lemon tart	Meat pie

Short pastry – ingredients and function

Ingredient	Function
Flour	<p>Soft to medium strength flour is recommended for short pastry to prevent too much gluten development.</p> <p>Too much gluten development, caused by over mixing the pastry, will cause the pastry to be chewy and tough eating, and the pastry will shrink during baking. However, as fat has a tenderising effect on gluten, a pastry which is high in fat can accommodate a strong flour such as baker's flour.</p> <p>With the increase in the gluten market, products can be made from gluten free flour.</p> <p>It is from the coagulation of the flour proteins and gelatinisation of flour starches during baking that the structure of the pastry is formed.</p> <p>When you use wholemeal flour as a substitute for bakers' flour you will need to add extra moisture because the bran in the flour will absorb extra moisture.</p>
Fat	<p>The flavour of the fat will directly influence the flavour of the pastry, so that is why some establishments prefer to use butter. We will be focusing on this later in this unit.</p> <p>Fats with a low melting point, such as butter, may be used, but the pastry will require more handling for sheeting, for example it may require refrigerating to firm the pastry before sheeting, and may also require handling in smaller amounts.</p> <p>The fat acts as a lubricant helping to retard any gluten development in the flour, producing a shorter eating pastry.</p> <p>Fat is added at the rate of approx. 25% to 67% of flour weight. The higher the fat content the shorter eating the pastry.</p>

Ingredient	Function
Sugar, caster or icing	<p>A sugar with a small crystal (caster), or in powder form (icing), is used so that will dissolve in the small amount of moisture used in the pastry.</p> <p>The sugar will sweeten pastry, the degree of sweetness depending on amount used. For sweet short pastry the amount used may vary. Use 25% to 50% of flour weight.</p> <p>The sugar will help to soften the gluten, producing a shorter eating pastry.</p> <p>During baking the crust sugars will caramelise producing a golden brown crust colour on the pastry.</p>
Moisture, water, milk or egg	<p>The main purpose of adding moisture to the pastry is to help bind the dry ingredients.</p> <p>Moisture is added at the rate of approximately 20% to 25% of the flour weight.</p> <p>Egg and/or milk may be used instead of water to enrich and improve the flavour of the pastry.</p> <p>Egg yolk (carotene) improves the crumb colour of the pastry.</p> <p>Egg provide additional structure to pastry when it coagulates during baking.</p> <p>When milk is used you will find that the lactose (milk sugar) in the milk will help to improve the crust colour during baking of the pastry.</p>
Baking powder	<p>Added in small amounts, to help make the pastry tender. The small amount of carbon dioxide gas evolved will open the texture slightly, making the pastry more tender eating.</p>
Skim milk powder	<p>Mainly used in savoury short pastry to:</p> <ul style="list-style-type: none"> • Improve the crust colour during baking • Provide additional flavour to the pastry • Make the pastry more tender when eating.
Salt	<p>Improve the flavour.</p> <p>To cater for people on low salt or salt free diets you may leave the salt out of the pastry, only the flavour will be affected.</p>

Ingredient	Function
Flavours to enhance the pastry	<p>Lemon essence, or lemon zest, is traditionally added to sweet short pastry to help improve the flavour of the pastry by complementing the flavour of the other ingredients used.</p> <p>Flavour enhancers are optional and will depend on the recipe specifications.</p>

Mixing and processing short pastry

Whether you are making a sweet or savoury short pastry, it is important to remember that you must avoid over mixing the pastry, as this would result in developing the gluten and producing a tough chewy pastry which would shrink during baking.

There are two common mix processes used when producing short pastry - rub-in (crumbing) method and the sugar batter method.

Rub-in (crumbing) method

The rub-in or crumbing method is used to make savoury short pastries. The sequence for mixing using the rub-in method is:

1. Rub the fat through the dry ingredients to resemble breadcrumbs.
2. Add the egg and water and mix to a paste.

Principles of 'rub in' method of mixing:

- By coating the flour proteins with fat, it acts as a lubricant, thereby helping to prevent gluten development.

Sugar batter method

The sugar batter method is used to make sweet short pastries. The sequence for mixing the sugar batter method is:

1. Cream the fat, sugar and some of the flour to a smooth paste (batter).
2. Gradually add the liquids (egg, water) and mix well to emulsify.
3. Add the remaining flour, baking powder and mix to a paste. Be careful not to over mix as this will develop the gluten.

Principles of the sugar batter method of mixing:

- The principles of the 'creamed' method is that the mixing of part of the flour with the fat helps to retard gluten development during mixing.

Your teacher will demonstrate making short pastry with using the rub-in and sugar batter method, and you will have time to develop your skills in the practical sessions for this unit.

Some common faults in short pastry:

Faults	Cause
Tough chewy pastry	<ul style="list-style-type: none"> • Over mixing the dough causing the development of gluten
Moist soggy product	<ul style="list-style-type: none"> • Too much liquid added • Oven temperature too low
Hard	<ul style="list-style-type: none"> • Too little fat, too much liquid • Incorrect mixing technique • Over baking
Too crumbly and dry	<ul style="list-style-type: none"> • Not enough liquid • Over baking

(Fosket, 2015)

Puff pastry

What is laminated pastry?

Laminated pastry, also known as puff pastry, is a pastry made up of hundreds of alternate layers of fat and dough. During baking the pastry will puff up to produce a light flaky crisp type of product. The pastry doesn't contain sugar so it is suitable for producing both sweet and savoury products, depending of the filling being using.

Some examples of bakery products made with puff pastry are:

- Mille-Feuille
- Vol-au-vents
- Gourmet meat pies
- Sfogliatelle

Puff pastry – ingredients and function

Ingredient	Function
Flour	Baker's flour is used to provide the structure of the pastry.
Fat	Roll in fat, such as butter, pastry margarine or shortening, should be of a pliable consistency so that it can be easily rolled and laminated with the dough without cracking. The lamination of the fat with the dough helps in the process of the pastry rising during baking, by separating the layers of dough. The fat helps to flavour the pastry.
Water	Water binds the dry ingredients together and helps in the development of the gluten in the flour. It is generated into steam during baking, helping to make the pastry rise. Water is added at the rate of approximately 50% of the flour weight to produce a firm dough.
Salt	Salt is added to the dough to help improve the flavour (approx. 1% of flour weight).

Mixing and processing puff pastry

Detrempe

As previously mentioned, three methods for processing puff pastry (English, French and Scotch) share a common initial mixing process known as detrempe. This mixing technique can be done by hand on the stainless steel work bench, using a scraper and your hands (see image below), in a mixing bowl or in an industrial mixer.



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Incorporating fat into laminated pastry dough

Puff pastry is made by three basic methods. The difference between each methods is the way fat is incorporated into the dough. This results in pastry dough with different properties.

The table below outlines the mixing methods used for each method. In the following pages you will learning more about each method.

Mixing method	Method for incorporating fat	Characteristics
French and English	Rolled in	Even layered pastry suitable for matches and palmiers.
Scotch	Chopped in/rough method	More uneven layered pastry suitable for sausage rolls and meat pie tops.

Mixing and processing French and English methods

The mixing and processing steps used in the French and English puff pastry methods are:

1. Detrempe - mix initial dough (flour and water).
2. Lightly dust the pastry and wrap in plastic.

3. Rest and refrigerate for 30 minutes.
4. Incorporate fat using the English or French method. At this stage the English and French folding methods create the lamination.
5. Rest and refrigerate dough in preparation for forming and shaping.

The process for incorporating the dough is shown on the following pages. Your teacher will demonstrate making puff pastry and you will have time to develop your skills in the practical sessions for this unit.

The French method





Image	Steps
	<p>Make the dough using the flour, salt, water and colour.</p> <p>Mix well to develop the gluten. Mould the dough into a round ball and cover the dough with plastic and rest for 10 minutes. Mould the butter into a square block.</p>
	<p>Cut the dough and press out to form a four-leaf clover.</p> <p>Place the butter in the centre.</p> <p>Note: The fat must be a similar consistency as the dough.</p>
	<p>Fold the dough over to completely enclose the fat.</p> <p>Give a series of turns ensuring it is rested in the cool room between each fold.</p>

Image	Steps
	<p>5 folds is recommended and a maximum of 6 folds depending on the flour to fat ratio of the pastry.</p> <p>If the correct lamination process is achieved and enough layers are formed it will create a good final product with great volume and taste.</p>

Images © TAFE NSW

Notes:

The English method

This method is also a fold in method, but in this case a different method is used to incorporate the fat into the dough.





Image	Steps
	<p>Produce the dough in the same way as the French fold in method.</p> <p>Roll the dough out into a rectangular shape.</p>

Image	Steps
	<p>Mould and block the fat into a rectangular shape, large enough to cover 2/3 of the dough length.</p>
	<p>Fold the uncovered part of the dough to cover half of the roll in fat, fold again to enclose the remaining half of the roll in fat.</p>
	<p>Give a series of three or four fold turns, depending upon the ratio of fat to flour, resting in the cool room between each fold.</p>

Images © TAFE NSW

Notes:

The Scotch method

The Scotch mixing and processing method for producing puff pastry is slightly different from the English and French method. As outlined below, the butter is added in pieces, the dough is then rested before the lamination process takes place.

The Scotch puff pastry method, also known as the rough method, suitable for meat pies and sausage rolls.

Mixing and processing Scotch method

The mixing and processing steps used in the Scotch puff pastry method are:

1. Detrempe - mix initial dough (flour and water).
2. As the dough is formed, add the pastry fat pieces to disperse through the dough. The roll-in fat pieces are to remain intact (see image below).
3. Lightly dust the pastry and wrap in plastic.
4. Rest the dough and refrigerate for 30 minutes.
5. Roll and give a series of folds to form the lamination.
6. Rest and refrigerate dough in preparation for forming and shaping.



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Video clip

Activity 4.2: Producing puff pastry

Click the links below to view the following videos on producing puff pastry:

- Part 1 - <https://vimeo.com/295941330/064bfb748f>
- Part 2 - <https://vimeo.com/295953979/8e0aace0ed>

Important points for producing puff pastry

- Use a strong flour.
- Mix the dough well to develop the gluten.
- The dough consistency needs to be the same as the roll in fat to allow for even layering of the dough and fat.
- Give the dough/pastry plenty of rest so that it will stretch/reduce evenly and easily when rolling it out.
- Plasticise the roll in fat so that it will laminate evenly with the dough.
- Cover the dough/pastry with appropriately sized plastic to prevent it from developing a skin.
- When folding the block of fat into the dough, (fold in method) make sure that it is a snug fit, to avoid having surplus dough around the edges.
- When folding the pastry, keep the thickness even and edges square. Do not roll it out too thin, as the paste will eventually lose the layering.
- Brush off surplus flour with a flour brush before folding the pastry for each turn.
- Turn the pastry 90 degrees between each turn.
- When rolling out the pastry gradually reduce the thickness to prevent the rupturing of layers.
- Mark the top of the pastry with your fingers, this will ensure you won't forget how many turns the pastry has had. It helps another person if they take over from you.
- Rest the pastry prior to baking.
- Bake the pastry in a hot oven.

What determines the richness of puff pastry?

As previously mentioned puff pastry is used for various different products, which are required to puff up so that we can split and fill the baked pastry. Puff pastry is also used for pie tops which are not required to rise too much. It's popular now to make both the base and top from puff pastry for gourmet pies. The richness of the pastry is determined by the ratio of fat to flour:

- A full (100%) puff pastry is considered to be the richest puff pastry using equal amounts of fat to flour, for example 1 kg of fat to 1 kg of flour.

- Different ratios of fat to flour are used to produce different products, for example a 3/4 paste may be used for vol-au-vents, whereas a 1/3 paste may be used for pie tops.
- The higher the ratio of fat to flour the more volume and flakiness can be expected from the pastry, hence the use of a 1/3 paste for pie tops which require little lift, as compared to a 3/4 paste used to produce the lift in matches and other similar products.
- Each bakehouse will use different ratios of fat to flour for different products, this being determined by how much lift that you or your customers expect from the paste.
- The minimum butter to flour ratio for puff pastry is 50% or half paste.

What determines the required number of turns/folds needed for the puff pastry?

Puff pastry needs to be rolled and folded a number of times to form the alternate layers of fat and dough required to make it rise during baking. The folding of the pastry may be done as a threefold (half turn) or four fold (book turn). The four fold produces more layers of fat and dough than the three fold.

The ratio of fat to flour will determine how many three folds or four folds you will need to give the pastry to make it rise sufficiently.

You can use the following count on layer formation to compare the three fold (half turn) and four fold (book turn) techniques:

No. of folds	Layers formed by the three fold method	Layers formed by the four fold method
1	$3 \times 3 - 2 = 7$	$4 \times 3 - 3 = 9$
2	$3 \times 7 - 2 = 19$	$4 \times 9 - 3 = 33$
3	$3 \times 19 - 2 = 55$	$4 \times 33 - 3 = 129$
4	$3 \times 55 - 2 = 163$	$4 \times 129 - 3 = 513$
5	$3 \times 163 - 2 = 487$	$4 \times 513 - 3 = 2049$
6	$3 \times 487 - 2 = 1459$	$4 \times 2049 - 3 = 8193$

- Full paste requires 6 folds (6 half turns)
- 3/4 paste requires 5 or 6 three folds (5 or 6 half turns)
- 1/2 paste requires 4 three folds (4 half turns)

What makes the puff pastry rise during baking?

During the rolling and folding of the pastry, large numbers of alternate layers of fat and dough are formed. When placed in a hot oven the fat layers melt and are absorbed into the adjacent dough layers.

The water in the dough layers and margarine is generated into steam and replaces the melted fat, being entrapped between the dough layers. The steam forces the dough layers apart, causing the pastry to rise. Continued baking causes the pastry to brown, starches to gelatinise, proteins to coagulate, and dry the pastry so that it becomes crisp.

Important points for puff pastry production using butter sheets:

- Ingredients must be cool so that the butter will not become too soft.
- Use fresh butter sheets.
- Use ice water for production of the pastry dough (keep cool when processing).
- Cold butter needs to be plasticised, 5% bakers flour can be added. The added flour will give the butter a better plastic consistency.
- Shape the plasticised butter on a sheet of silicone paper to the required block size. Place the butter back into the refrigerator until you are going to fold the butter into the dough (silicone paper ensures easy handling).
- Keep the puff pastry cool between turns to prevent the butter from becoming soft.
- Process puff pastry on a cool surface by ideally using a marble slab, water-cooled bench or cool production area.

Disadvantages of using butter in puff pastry production

- The low melting point makes butter a very hard product to work with and therefore a lot more skill is required — the pastry requires constant cooling and the production needs to be completed quickly as the product is fragile.
- Cold butter is very brittle and makes the lamination process of puff pastry difficult. If cooled too much, the butter layer will break in the rolling and folding process.
- Butter is more expensive than commercial pastry margarines or shortenings.
- Butter needs to be refrigerated at all times.

Some common faults in puff pastry:

Faults	Cause
Pastry lacks volume, is fragile and fat is showing on the baking tray	<ul style="list-style-type: none"> • Too few folds
Pastry lacks volume and flakiness, looking more like savoury short paste	<ul style="list-style-type: none"> • Too many folds • Not enough roll in fat
Pastry lacks volume	<ul style="list-style-type: none"> • Oven too cold • The fat and dough are of different consistency, poor lamination • Pastry rolled too thinly • Flour not strong enough • Thickness of paste reduced too quickly, ruptures layers • Pastry layers compressed with a blunt knife or cutter • Too many turns • Not enough roll in fat
Excessive shrinkage of pastry during baking	<ul style="list-style-type: none"> • Insufficient resting between folds and/or prior to baking • Flour too strong
Uneven lift of the pastry during baking	<ul style="list-style-type: none"> • Roll in fat unevenly distributed in the pastry • Using blunt knives/cutters to cut pastry • Egg wash running down one side of cut edge • Cutting too close to the edge of the sheeted paste • Not enough rest before baking
Pastry topples during baking	<ul style="list-style-type: none"> • Insufficient resting of the pastry • Pastry is cut too thick • Uneven distribution of fat and dough layers • Insufficient turns/folds

Puff pastry rules

1. To achieve lamination the consistency of the butter should mimic as closely as possible the consistency of the dough, called detrempe. If the butter is too hard, it will just break up and poke holes in the Detrempe. If the butter is too soft, it will just soak into the dough and squeeze out the sides, leaving you with overly-rich dough with exactly one layer, which is not what we want to achieve.
2. Make sure your rolling surface and the surface of the dough is lightly floured at all times. Sticking can tear your delicate layers, allowing even the right-consistency of butter to squeeze out. Since the tough layers (lean-ish dough) are separate from the tender layers (butter), a little more flour isn't going to hurt — you'll still get an excellent rise. Brush off the excess flour before folding. The time that you want the dough to stick is when the dough layers are being rolled together.
3. As you roll, flip and turn your dough over, you will see some shrinkage as a result of the stretching and pulling. The top layer will always roll further than the bottom layer. In order to keep the layers even, flip frequently.
4. Rest the dough in the refrigerator between each fold and roll (turn), allowing the butter to maintain optimum plasticity – not too cold, not too hot – and for the gluten formed by all the turning (which is really just a type of kneading) to relax enough to be able to roll out multiple times.
5. Puff pastry requires fairly strict adherence to the ideal rectangle. Roll with finesse, and when finesse fails pull gently with your hands, to square up the dough as much as possible before folding. Keep the dough square with all the edges, meeting up more or less perfectly, gives you the maximum amount of dough containing all possible layers. If you don't keep the dough square, there will be some areas around the edges that could lack as many as hundreds of layers, causing uneven rising. This is especially crucial if you want to bake a large sheet of puff.
6. Use a high protein flour to develop gluten in the pastry. You want to use pastry flour because it is finely ground and sifted. Use “European style” butter with relatively low moisture. Granted, water releases steam which causes the puff in the first place, but there's already some water both in the detrempe and in special butter. Using plain old store brand butter pushes you right over the edge to soggy, so look for butter with a butterfat content of 82%. And no, 80% butterfat isn't close enough — that's what “normal” butter contains.

Choux pastry

Today's choux pastry evolved from an original recipe where mashed potato was used instead of flour. Choux pastry is unique in as much as it is a pastry that is piped into shape for baking, whereas most other pastries are rolled out and cut into shape for baking.

Choux is the French term for 'cabbage'. This is due to the fact that choux pastry puffs resemble a cabbage due to the typical rough textured surface. One special feature of a choux pastry batter is the fact that the starches in the flour are gelatinised and proteins in the flour are coagulated prior to baking.

Choux pastry does not contain sugar; therefore it can be used to make sweet or savoury products. Most choux pastry products are baked, but some varieties are fried to give a different effect, then filled with savoury fillings, such as avocado and cream cheese filling or salmon mousse.

Choux pastry – ingredients and function

Ingredient	Function
Flour	Baker's flour is most commonly used in the production of choux pastry. The gluten content of the baker's flour is necessary to provide the structure in the pastry.
Fat	Butter is often used as it gives superior flavour; however, other fats used are cake margarine, short paste margarine, pastry margarine, frying shortening or a mixture of the above. The choice is up to the individual. The fat produces a shorter eating pastry and contributes to the flavour of the pastry.
Egg	Fresh shell eggs are the most suitable due to the stability of the albumen (egg white).
Water	Water is used to bind the dry ingredients and necessary for the gelatinisation of starches and coagulation of proteins in the roux.

Mix and processing the choux pastry roux (panade)

Cooking the roux correctly is essential for making a quality choux pastry.

The processing steps to mix choux pastry are:

1. Measure the ingredients accurately, according to the recipe specifications.

2. Boil the water with the fat. It is important that the liquid is boiling vigorously and the fat is dispersed, before adding the flour.
3. Stir in the flour until the mixture leaves the sides of the pan and the starches and proteins in the flour are cooked. This cooked paste of water, fat and flour is known as a roux or panade — both French terms. Cook well over a low heat to gelatinise the starches and coagulate the proteins.



Pastry roux in saucepan on a chopping board by [Montserrat Solis](#) under [Pexels licence](#)

4. Cool the roux to below 50°C.
5. When the roux is cool, gradually beat in the egg, mixing well between each addition. Only add enough egg to produce a sheen on the paste. The paste should retain its shape when piped.

Important points to remember when producing choux paste

- Bring the water and fat to the boil.
- Once the flour is added, continue stirring and cooking over a low heat until the mixture leaves the side of the saucepan. You will find the roux has a sheen, which indicates the starches in the flour have gelatinised. During this initial cooking stage the flour protein will coagulate when the mix reaches a temperature range 78–80°C.
- It is necessary to cool the mix to a temperature below 50°C before the eggs are added, otherwise the egg proteins will coagulate when mixed with the hot panade.

- The eggs must be added in small amounts and thoroughly mixed before the next addition. You will note in the choux paste recipe that the amount of egg is variable. You are required to produce a batter that is smooth, shiny, and yet stable enough for the piped paste to hold its shape on the tray. The amount of egg added is a critical point to obtaining an excellent finished product.
- Choux pastry which is too tight will not rise sufficiently during baking.
- Choux pastry which is too soft will lose its shape and not rise sufficiently during baking.

Tray preparation

Clean trays should only be used and can be lightly greased. Too much grease can cause the choux to lose its shape. As an alternative you can use silicone paper to line the baking tray.

Baking

Choux pastry needs to be baked at a high temperature between 200°C and 220°C to help generate steam in the paste. It is important not to open the oven door during the first 15 minutes of baking the choux paste; otherwise the products may collapse. A well-baked choux paste product will be dry on the outside with a small amount of moisture left in the centre.

A moist environment in the initial baking is necessary to give maximum expansion in the oven. At the end of the baking time for the last 5 minutes the damper may be opened to allow the steam to escape and the products to dry out. It is essential not to open the oven door until the pastry has set otherwise the pastry may collapse. When baked pastries come out of the oven they need to be transferred to a wire to cool before finishing. Baked unfinished products can be made up to a week in advance and stored in the cool room. Unfilled pastry shells may be frozen, and then thawed and filled as required. Remember to protect the pastries from freezer burn by storing in airtight containers.

Aeration of choux pastry

When choux pastry bakes in the oven, any air that has been incorporated during the beating stage will expand and the water in the paste converts to steam. The expanded air, as well as the steam, tries to escape from the paste but is stopped because both are trapped and retained within the paste by films of coagulated gluten, gelatinised starch and uncoagulated film of egg albumen.

The egg albumen is extensible and will be inflated and become swollen by the inside pressure of the expanding air and steam, which cause the choux paste to rise and expand in the oven. Towards the end of the baking process, when the pastry has reached full volume, the proteins in the egg are coagulated. With continued baking, the pastry will dry out sufficiently so that it will hold its shape as it cools.

Baked colour

During baking the complex reaction between proteins and carbohydrates in the paste will result in the browning of the pastry (Maillard reaction).

Finishing

As an example profiteroles for a gâteau St. Honoré are coated with caramel and filled with:

- crème patisserie
- crème diplomat - which is mixture of crème patisserie and cream, plain or flavoured.

Evaluation of choux pastry

Criteria	Desired result
Texture	Baked pastries should be hollow inside with a dry outer shell
Flavour	The fillings should be the predominate flavour
Colour	Baked pastries should be golden brown in colour

Some common faults in choux pastry:

Faults	Cause
Closed structure with a heavy texture	<ul style="list-style-type: none"> • Too much flour • Not beaten long enough • Incorrect oven temperature
The product collapses	<ul style="list-style-type: none"> • Too much moisture in the mixture • Oven door opened during the initial stages of baking • Oven temperature too low

Faults	Cause
Pale colour	<ul style="list-style-type: none"> Not baked long enough Oven temperature too low
Pastry is cracked	<ul style="list-style-type: none"> Oven temperature too high Damper left open during the total baking time, causing the product to dry out too much

(Norris, 1980)

Mixing extensible pastry dough

Extensibility in dough refers to its ability to be stretched. This is often referred to with the elasticity of dough. The gluten in dough is what gives the dough these characteristics.

Strudel dough

Strudel dough is a specialist pastry, also known as an extensible dough/pastry. The term extensible comes from the process used to form the pastry prior to filing, where it is carefully stretched by hand to a paper thin, almost transparent, sheet. We will explore this forming process in the next topic.

Strudel dough is made of fat, flour and water. Strudel dough is a developed dough and rested for ideally 24 hours prior to stretching.

Mixing and processing strudel dough

The processing steps to mix strudel dough are:

1. Measure the ingredient accurately, according to the recipe specifications
2. All ingredients are mixed together to form a smooth dough
3. The dough is then covered in plastic and rested in the coolroom
4. The dough is rested for 24 hours to ensure optimal elasticity.

Tip: Production schedule - timings

When reviewing your production schedule it is important to factor in the resting time required the different pastry doughs. For example, strudel dough needs to be mixed and rested the day before it is required.

Filo pastry

Filo (or phyllo) pastry is available commercially, either frozen or fresh, from industry suppliers. You will recognise it as being extremely thin layers of pastry/dough, similar to the thickness of tissue paper. To use the filo pastry each layer is brushed with melted butter or oil. Usually three to four layers are placed on top of each other with the butter joining them.

A sweet or savoury filling is then wrapped in the layered pastry and baked in a hot oven. As the pastry is so thin you will find that it may dry out very quickly if left exposed to the air. When dried out the pastry becomes very brittle and difficult to handle. So when using the pastry it is necessary to keep it covered with a damp cloth. The filled pastries may be baked or fried.



Self-check questions

Activity 4.3: Check your knowledge

Read the question carefully. Your answer should be between 25-100 words.

1. What determines the required number of turns/folds needed for puff pastry?

2. Describe the functions of fat in puff pastry.

3. What may cause the fault of an uneven lift of puff pastry during baking?



Practice activity

Activity 4.4: Product research – Vol-au-vents

You are required to research vol-au-vent and find out the following:

- History of vol-au-vents
- The type of pastry used to make vol-au-vents
- Common finishing of vol-au-vent
- Common fillings and examples used in vol-au-vents
- Find at least two images of vol-au-vents

Write your notes about vol-au-vents below.

Topic 5

Form and fill pastry products



Topic 5: Form and fill pastry products

This topic is about how you form, or shape, and fill non-laminated and laminated pastry products. You will learn about:

- using scrap pastry dough
- rolling non-laminated and laminated pastry to the thickness required for product type
- cutting, slicing and portioning pastry doughs as required for product type
- stretching extensible dough for filling as required for product type
- adding fillings as required for product type
- loading tins and blind to prepare for baking
- checking pre-bake formed and filled pastry products to identify faults and rectify them

Production scheduling

At the beginning of Topic 4 we reviewed the importance of the production schedule and the considerations and techniques when developing the schedule. The production schedule is key to ensuring all the production processes are considered.



Practice activity

Activity 5.1: Revision

Revise the techniques and considerations you learnt in Topic 4 and the practical sessions for this unit.

Use the table below to record any further considerations and techniques you learn throughout this topic and the remaining production steps in this learner guide. You may also like to add production techniques and reminders you learn in the practical sessions for this unit.

Techniques	Considerations
Timings	Before rolling the pastry ensure trays and tins are prepared and close by for easy transferring.
Product processing requirements	Before rolling the pastry ensure the required filling is conditioned ready to use.
Volume requirements	

Techniques	Considerations
Minimising waste	Use scrap to help minimise waste.
Finishing requirements	
Bake parameters	Before rolling the pastry ensure the oven is preheated to the correct temperature.

Using 'scrap' pastry dough

It is important that you understand what scrap pastry is before you start the rolling and cutting process.



Scrap dough by [Flockine](#) under [Pixabay licence](#)

A key requirement of pastry production is to ensure the quantity of pastry dough produced yields the number of goods specified. In the recipe. To assist in this process it is best to retain some of the fresh paste before the rolling process begins.

After the initial cut of the rolled pastry sheet you will be left with scraps of dough – this is referred to simply as 'scrap' in the baking industry.

Some of the scrap from the first cut is then worked back into the fresh paste that was retained. The rolling and cutting process is then repeated.

The second cut will be a blend of fresh pastry and scrap pastry, instead of being all scrap pastry. Using 100% scrap pastry would produce a paste, which is tough and would shrink too much during baking

This helps meet the recipe yield and minimises waste.

Using puff pastry scrap

Scrap puff pastry should be mixed with some fresh puff pastry by evenly spreading it between the final folds of the fresh pastry.

By mixing the scrap pastry with the fresh pastry you will not achieve as much lift from the pastry, as compared to using only fresh pastry. Incorporating too much scrap pastry with the fresh pastry will result in poor lift in the pastry.

Scrap puff pastry can also be used to produce other goods, such as cheese twists, pastry sheets, as well as decorative pre-bake finishes, etc.

Rolling pastry to the thickness required for product type

As previously stated in Topic 1, rolling out of the pastry is usually done either by hand with a rolling pin for small quantities of pastry dough, or by using a pastry sheeter for larger production volumes.

Rolling pastry by hand

When rolling pastry by hand:

- Use a lightly floured surface
- The rolling pin should also be lightly floured and free from pastry pieces and any other foreign materials.
- Apply light even pressure rolling away from yourself.
- Turn the pastry regularly to prevent it sticking. Keep the rolling pin lightly floured
- Do not apply too much pressure – you should treat the pastry with care.
- The shape and thickness of the hand rolled pastry sheet should reflect the products being made.

For example, a short pastry base for a round flan is usually rolled to a 3mm thickness. The sheet also needs to be wider than the flan base to accommodate the sides of the flan (2.5-3cm)

Pastry sheeter

In your workplace the pastry sheeter may also be referred to as the dough brake or dough sheeter. Using the pastry sheeter:

- Dust the pastry and the pastry sheeter arms /belts with bakers' flour.

- Block the pastry and flatten slightly with a rolling pin before doing the first pass through the sheeter. Remember that the pastry has to be of a size and shape to line the baking tray depending on specification.
- Reduce the thickness of the pastry gradually to avoid tearing the pastry.

The process of using a pastry sheeter to roll our pastry is called '*sheeting*'.

When rolling out the pastry gradually reduce the thickness to prevent the rupturing of layers. This produces a smooth, even thickness of the dough for use in making specialist pastry products.

After the pastry has been sheeted using pastry sheeter it should be laid out on a lightly floured bench for cutting slicing and portioning according to the recipe specifications.

At this stage, it is advisable to run the rolling pin across the pastry one direction. Known as cross pinning, this process helps offset shrinkage in during baking.



Video clip

Watch a video clip on how to use a pastry/dough sheeter:

<https://www.youtube.com/watch?v=YUyOCriFS1c&t=172s>

Forming extensible dough

Strudel dough's is formed by stretching the dough to a paper thin sheet. You will need a large clean bench space, preferably one you can walk around to stretch the dough from each side. You should work the dough until you have a paper thin pastry sheet.



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Steps used to form extensible dough

1. Remove the rested dough from the cool room
2. Roll out the rested dough into a rectangle before commencing the stretching process
3. Dust the back of your hands with flour.
4. Then, gently lift the dough from underneath with the back of your hands stretching the dough bit by bit.
5. Work your way around the bench stretching the dough in all directions. It takes practice to develop the skill of stretching extensible dough without breaking it.
6. Once the dough is at the required thinness it is ready to be filled and rolled according to the product specifications.

Forming choux pastry

As described in Topic 4 choux pastry shapes are formed by piping the pastry dough directly onto prepared lined trays.



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Your teacher will be demonstrating the correct piping techniques used for choux pastry products to achieve a uniform and consistent product.

Notes:

Pastry shapes: Cutting, slicing and portioning pastry

Once the pastry has been rolled or sheeted ready for shaping, cutting, slicing and portioning it is important to work quickly so the pastry remains as cool possible.



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Pastry shapes, slicing and portioning will depend on the product specifications and may extend to shapes being cut for prebake decorating.

Your teacher will demonstrate a variety of processes and techniques use to shape, cut slice and portion pastry and you will have time to practice in the practical sessions for this unit.

The tips below will help get you started

- Always use a sharp clean knife or pastry wheel.
- Take care not to stretch the dough during this stage as this may cause the pastry to shrinkage during baking.
- Metal cutters, such as cookie cutters or other pre-defined shaped cutters may use to produce small portions pastry products or for decorative pre-bake finishes. Metal cutters helps ensure consistent and uniform shapes.
- Dip cookie cutters in flour between each cut, to avoid the pastry from sticking to the cutter.

Notes:

Adding fillings as required for product type

It's important to follow the recipe specifications to ensure you have the correct amount of filling prepared for the production run. Refresh your knowledge by re-reading Topic 3 in this workbook: Preparing fillings for pastry products.

Your teacher will demonstrate a variety of processes and techniques for adding pre-bake filling to pastry products and you will practice these in the practical sessions for this unit.

Notes:

Transferring rolled pastry

Below are some tips for transferring rolled pastry. You teacher will also demonstrate the correct way to transfer rolled pastry to prepared trays and tins.

- Small pastry shapes may be transferred to trays, tins by hand, however, care must be taken not to stretch the dough when transferring it.

- Do not attempt to transfer large rolled pastry sheets by hand. This may cause the pastry to stretch or distort and will result in shrinkage during baking.
- A rolling pin may be used to transfer a rolled short pastry sheet when making flan bases or similar products. This is done by rolling the pastry sheet tightly around the rolling pin and draping the sheet over the prepared tin, before trimming the edges.
- Extensible dough sheets are usually filled on the bench where they are stretched and then rolled into the prepared trays for baking.

You teacher will demonstrate the correct method for transferring a variety of pastry doughs

Loading tins and trays to prepare for baking

Baking tins and trays are to be kept clean, both inside and out. This will assist in preventing faults like dark crumb from a previous bake transferring to your product. Prepare baking tins and tray by scraping them clean using a metal scraper before papering with silicone paper. Trays also can be prepared using a clean silicone mat. Load the tins and trays with the prepared pastry as outlined in the recipe specification and bake according to temperature and time listed.

Notes:



Self-check questions

Activity 5.2: Check you knowledge

Read the question carefully. Your answer should be a minimum of 25 words but no longer than 100 words. You will need to refer to Topic 3 to assist with the below questions.

1. Describe the French method of making puff pastry.

2. Describe the English method of making puff pastry.

3. Briefly describe the process of rolling puff pastry using a pastry sheeting.



Practice activity

Activity 5.3: Product research – pithivier and gâteau St. Honoré

You are required to research pithivier and gâteau St. Honoré and find out the following:

- History of Pithivier and gâteau St. Honoré
- The type of pastry used to make Pithivier and gâteau St. Honoré
- Common finishing of Pithivier and gâteau St. Honoré
- Common fillings and examples used in Pithivier and gâteau St. Honoré
- Find at least two images of Pithivier and gâteau St. Honoré

Write your notes about Pithivier and gâteau St. Honoré below.

Topic 6

Pre-bake finish pastry products



Topic 6: Pre-bake finish pastry products

This topic is about how you pre-bake finish the pastry products from the previous topics.

You will learn about the following:

- preparing pre-bake finishing mediums to meet recipe specifications
- pre-baking finish specialist pastry products to meet end-product specification
- checking pre-bake finished specialist pastry products to identify faults and rectifying.

Preparing pre-bake finishing mediums to meet recipe specifications

There are a variety of mediums that can be used as a glaze before baking:

- egg wash using whole eggs
- egg wash using yolks only
- milk and egg wash
- castor sugar/icing sugar.

Lightly dusting pastry with pure icing sugar will caramelise in the oven to produce a golden brown caramel coating. Coarser sugars will retain most of their shape and produce a crunchier texture on the cooked pastry product.

An egg wash is used to produce a shine or sheen on the finished product. Egg yolk will produce a golden colour finish, and egg white will give a clear shine (without adding more colour to the product). Milk is used in an egg wash to encourage browning.

The wash can also be topped with seeds, nuts or sugar.

These finishes are applied to the specialist pastry product before or just before it has finished baking. This product is then termed oven finished. For example, a quiche.

Pre-bake finish specialist pastry products to meet end-product specification

The type of pre-bake finish you apply will depend on the product you are making.

Some examples of products that are oven finished (have a pre-bake finish applied) are:

Pre-bake finish medium	Product
Egg wash using whole eggs	Vol-au-vents
Egg wash using yolks only	Gâteau St. Honoré
Milk and egg wash	Savoury pies
Sugar used for garnishing	Mille-feuille



Self-check questions

Activity 6.1: Check your knowledge

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

1. List three mediums that can be used as a pre-bake finish/glaze.

2. List two advantages of egg wash and sugar as a pre-bake finish.



Practice activity

Activity 6.2: Product research – sfogliatelle pastries and cannoli

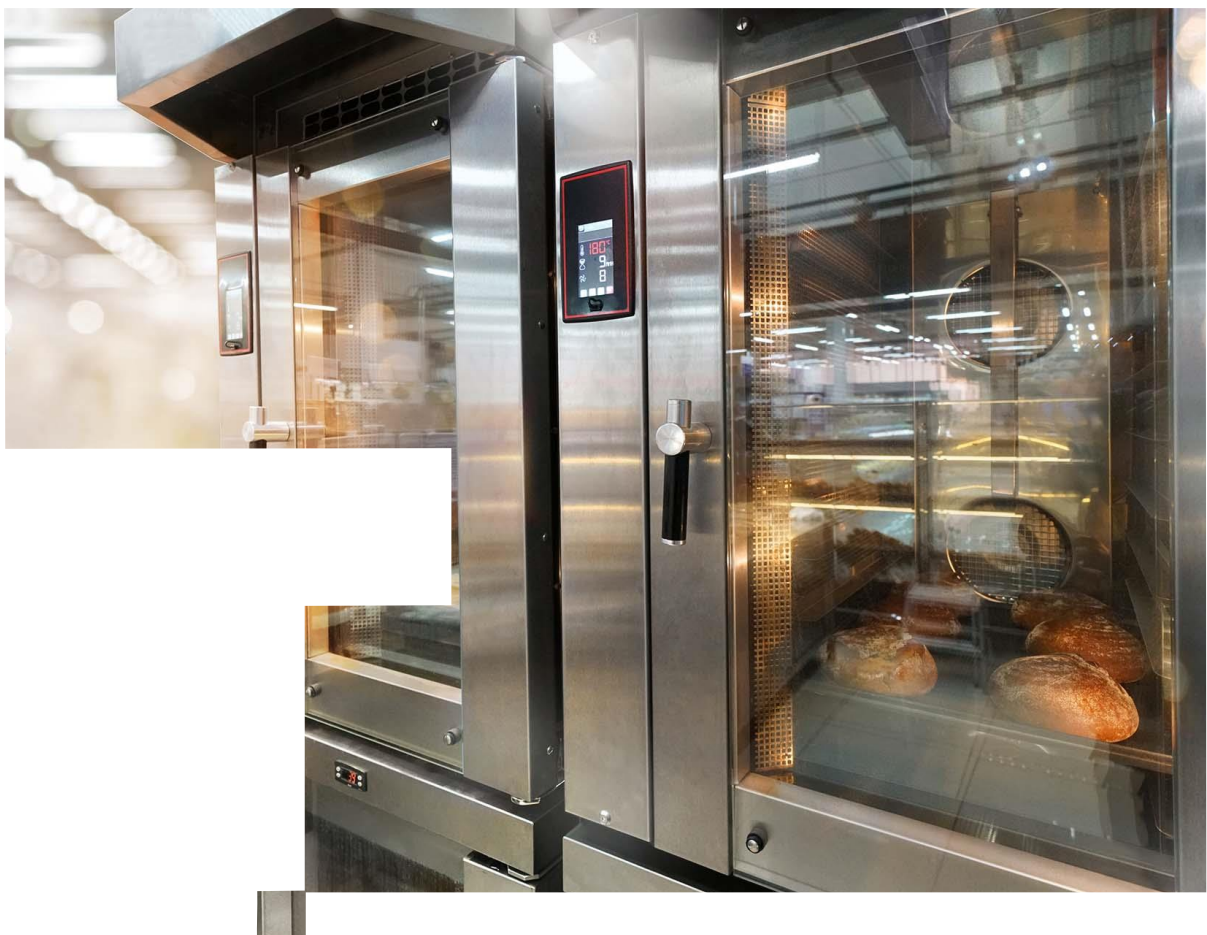
You are required to research sfogliatelle pastries and cannoli dough with sweet fillings and find out the following:

- History of sfogliatelle pastries and cannoli dough with sweet fillings
- Common finishing of sfogliatelle pastries and cannoli dough with sweet fillings
- Common fillings and examples used in sfogliatelle pastries and cannoli dough with sweet fillings
- Find at least two images of sfogliatelle pastries and cannoli dough with sweet fillings

Write your notes about sfogliatelle pastries and cannoli dough with sweet fillings below.

Topic 7

Bake pastry products



Topic 7: Bake pastry products

This topic covers how to bake specialist pastry products. You will learn about the following:

- setting baking temperatures and times to prepare for baking
- blind baking pastry products with blind baking medium as required for product type
- loading ovens and monitoring baking to achieve bake and stability required for product type
- unloading and transferring pastry products to cool
- checking pastry products bake to identify faults and rectify.

Setting baking temperatures and times to prepare for baking

A well-made product is often ruined because of the wrong baking conditions. It is a good practice, if uncertain of the baking temperature, to inspect the goods during the baking period and take remedial action if required.

Covering with a sheet of paper can reduce excessive colouring of the product. Too much bottom heat will be minimised by using double trays. Top and bottom heat can also be controlled by the use of oven controls for top and bottom heating elements in electric ovens. One important point is that the products remain in the oven until they are baked.

It is always important to record an ideal baking temperature for a product based on the type, size and load in the oven. Baking temperatures will vary according to the type of oven used (e.g. deck oven, rack oven, fan forced, convection, etc.) and the nature and size of the product being baked. For example, compare the baking conditions for tarts with the baking conditions used for choux pastry, strudels and so on.

The table below provides a general guide to baking temperatures for different types of pastries. All baked products have different requirements in regard to baking conditions - depending on sugar content, size and shape and density of the product. We will explore these factors next.

Pastry products	Temperatures
Savoury short pastry	200°C -230°C
Sweet short pastry	160°C - 210°C

Pastry products	Temperatures
Puff pastry	180°C - 230°C
Choux	200°C - 220°C
Extensible	

Factors that affecting the heat required to bake products

Sugar content

Sugar is responsible for any baked product burning. It is also responsible for the appeal of a nice tasty crust. The higher the sugar content, the lower the baking temperature needs to be and vice versa.

Size/shape

The larger a baked product is and the more complex its shape, the lower the baking temperature needs to be and vice versa.

Density

The denser a product is, the lower the baking temperature needs to be and vice versa.

Other factors

Three other minor factors that will affect the baking temperature of baked goods are the:

1. presence of steam
2. presence of top garnishes
3. material that the baking vessel is made of.

Make sure that the oven is preheated well in advance of baking, so that pastry products are baked with solid heat, to avoid scorching of the pastry during baking. Pastry chefs refer to this concept of having preheated the oven to the correct baking temperature as baking in a solid oven. This requires the oven to have reached the correct temperature prior to placing the product in the oven. This ensures every part of the oven (crown, sole, walls, door, and all reflective surfaces) is at the required temperature when baking. This allows the oven to maintain its temperature when loaded with items.

Failure to use a *solid oven* will result in the temperature of the oven dropping dramatically when loaded and the oven putting out a lot of energy trying to maintain temperature. The result would be a product which may be in contact with a part of the oven which is overheating (scorched pastry) or which will be baked at too low a temperature for longer (dry product). Professional Bakers ensure they control their equipment. This ensures control on all processes and a better quality and consistency of finished products. An oven is one of the most important parts of your equipment.

Recipe specifications will generally indicate recommended baking temperatures. These are guidelines and will need to be adjusted depending on the type and performance of the oven you use. Your teacher will supply further advice as required.

Blind baking for specialist pastry

Blind baking of the pastry means that it is baked without a filling. The filling is added to the pastry shell after baking.

Pastry cases can be blind baked in three different ways:

- Lining the tin/mould with docked short pastry. Bake after resting.
- *Dockings* is the technique where raw pastry is pierced, usually with a fork, just prior to baking. This helps prevent the pastry from lifting away from the tray or tin during baking
- Lining the pastry on the inside of the foil and place another foil on top.
- Lining the pastry on the inside of the foil/flan ring, line with greaseproof paper and fill with rice and dried beans. (Ceramic baking beads or weights can also be used and are reusable).
- A common way of blind baking today is substituting greaseproof paper with plastic film. The advantage of using plastic film as it completely encompasses the rice and minimising the risk of the rice contaminating the pastry.

Care must be taken to prevent the pastry from blistering or rising during baking.

Make sure that the pastry is dried sufficiently during baking by removing the rice/beans or the foil when the pastry is three-quarter baked. Docking the pastry will ensure more even and faster baking.

Loading and unloading ovens and monitoring the baking process

It's important to monitor your baking when baking your specialist pastry products and the use the correct PPE when loading the oven. It's important to also have a rack ready and nearby to transfer your hot trays for cooling.



Self-check questions

Activity 7.1: Check your knowledge

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

1. Describe the meaning of the term 'blind baking'.

2. List three main factors that affect the heat required to bake specialist pastry products.



Practice activity

Activity 7.2: Product Research – filo pastry and kataifi pastry

You are required to research filo pastry and kataifi pastry and find out the following:

- History of filo pastry and kataifi pastry
- Common finishing of filo pastry and kataifi pastry
- Common fillings and examples used in filo pastry and kataifi pastry
- Find at least two images of filo pastry and kataifi pastry

Write your notes about filo pastry and kataifi pastry.

Topic 8

Post-bake fill and finish pastry products



Topic 8: Post-bake fill and finish pastry products

This topic is about how you fill post bake and finish pastry products from the pastry created previously throughout this unit.

You will learn about the following:

- preparing post-bake fillings and finishing mediums to meet recipe specifications
- finishing baked specialist pastry products to meet end-product specifications
- filling baked specialist pastry products to meet end-product specifications
- checking finished specialist pastry products to identify faults and rectify
- preparing and transfer pastry products for presentation and storage in accordance with packaging and food safety requirements.

Preparing post-bake fillings and finishing mediums to meet recipe and end product specifications

Depending on the pastry product you are making, fillings may include:

- fresh/dairy cream
- starched thickened fruit fillings
- cream cheese filling
- ganache
- crème patisserie
- gourmet fillings.

Many of these fillings can be adapted according to the product requirements.

These products will also have a variety of finishes. When finishing a pastry, the best possible care should be taken, because the final appearance of a product can tempt your customers to purchase. Your teacher will demonstrate a variety of fillings in the practical activities.

After baking, many different finishes can be used, such as:

- boiled apricot glaze
- fruit
- sugar syrup

- commercial glaze (e.g. flan gel)
- starch based glaze
- icing or fondant
- ganache.

Sugar

Sugar quick facts

Sugar comes from sugar cane and sugar beet plants that are made up of sucrose. These sweeteners form part of a larger group of 'sugars' called carbohydrates. Carbohydrates are organic compounds made up of carbon, hydrogen and oxygen (CHO).

Carbohydrates, are classified as according to the number of CHO units they have, ranging from monosaccharide, or 'simple sugars' to more complex polysaccharides.

Name	Description
Monosaccharide	<p>Mono (one) saccharides of sugar</p> <p>Also known as 'simple sugars' they contain a single unit of CHO, e.g. glucose or fructose.</p>
Disaccharides	<p>Di (two) saccharides of sugar</p> <p>Have a chain of two monosaccharides, e.g. sucrose, lactose and maltose. Sucrose is the most common sugar in our diet and consists of one unit of glucose and one of fructose.</p>
Polysaccharides	<p>Poly (many) saccharides of sugar</p> <p>These long chains of many monosaccharides' units, e.g. starches.</p>

Properties of refined sugar

As a result of refining, sugar gains a number of important characteristics, which improve its suitability as an ingredient in bakery production, including:

- Providing sweetness without any undesirable aftertaste.
- Acting as a natural preservative by inhibiting bacteria growth.
- This is because the sugar is hygroscopic.

- Delays the coagulation of protein, which contributes to the smooth texture of products such as baked custard.
- Helps to brown the crust of products during baking.

Sugar products

- **Rapadura sugar (organic):** Unrefined cane sugar that preserves the natural taste of the sugar and it has a fine grain texture and can be used in place of sugar.
- **White graded sugar:** Made of evenly sized white crystals averaging 0.6 mm in size.
- **Pearl sugar (Nib sugar):** Refined white sugar that is very coarse and does not melt and keeps its shape in baking.
- **1A sugar:** A coarse grade sugar used for garnishing oven finished products (e.g. fruit pies.)
- **Caster sugar:** A fine white granulated sugar produced during the crystallisation process. The average crystal size of caster sugar is 0.3 mm, making it ideal for baking because it dissolves more quickly than white graded sugar.
- **Golden demerara sugar:** Premium raw sugar produced from selected syrups. Imparts a rich caramel taste to foods and can be used in many types of baking.
- **Raw sugar:** Straw coloured granulated sugar produced from sucrose syrups which contain residual colour and flavour from the sugar cane plant.
- **Brown sugar:** Fine-grained and moist crystal, brown in colour.
- **Pure icing sugar:** An extremely fine white powder, pure icing sugar has no additives and dissolves rapidly but can form lumps if stored for long periods. Pure icing sugar is ideal for use in cake decorating, particularly royal icings.
- **Icing sugar mixture:** Icing sugar is a powdered sugar mixed with a small percentage of starch to help prevent lumps from forming.
- **Golden syrup:** A concentrated liquid mixture of sucrose, glucose and fructose with a distinctive flavour and golden colour, its characteristic golden colour comes from traces of molasses.

Caramelised sugar

Important points when handling caramelised sugar – caution.

- When handling the caramelised sugar, remember that a skin burn from the hot sugar may be a severe burn.
- As a precaution have a bowl of cold water situated beside you when dipping the pastries into the hot caramelised sugar.

- If you happen to get some hot sugar onto your skin then immediately immerse it into the bowl of cold water, which will help to reduce the burning effect of the caramelised sugar.
- If the burn is very serious, then hold the burnt area under running cold water for ten minutes, then wrap it in a clean dressing and seek medical advice.
- Use the caramelised sugar immediately; otherwise it will start to set as hard toffee in the pan.
- To clean the pan fill the pot with hot water to cover the remaining caramelised sugar and place on the stove bring to the boil until the remaining caramelised sugar is dissolved.

Chocolate ganache based glazes and chocolate based sauces

Chocolate ganache and chocolate based glazes and sauces are popular mediums used for coating and finishing pastry products.



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Ganache

Ganache can be used as both a filling and a glaze in pastry product production and is a mixture of boiled cream and chocolate with varying ratios to give different textures and mouth feel. 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. It also aids the complete melting of and the thorough combining with the chocolate.

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

For practical purposes, we look at four basic consistencies:

1. for soft fillings
2. to achieve piping consistency
3. firm enough to roll by hand (for example, truffles for truffle torte)
4. firm enough for cutting.

Based on using 1kg of fresh cream (35%), the following quantities (in kg) of chocolate are required:

Type of chocolate	Consistency 1	Consistency 2	Consistency 3	Consistency 4
Dark chocolate	1.0–1.2kg	1.2–1.6kg	1.6–2.0kg	2.0–2.5kg
Milk chocolate	1.5–1.8kg	1.8–2.2kg	2.2–2.6kg	2.6–3.0kg
White chocolate	1.7–2.0kg	2.0–2.4kg	2.4–2.8kg	2.8–3.2kg

If small amounts of liquid (liqueurs, spirits, flavouring pastes, etc) 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.

If increased quantities of liquid (liqueur) are used, they may not readily combine with the ganache. An addition of up to 10% of very fresh unsalted butter or another fat will bring the ganache back to a smooth consistency.

During the creaming (whipping) process, butter of a soft (equal to ganache) consistency is added bit by bit. The function of the butter is to separate the heavier chocolate/cream combination, thus improving the melting properties in the mouth (at body temperature).

A ganache can also be made from butter and chocolate. Softened very fresh butter is lightly creamed to allow it to combine with the liquid tempered chocolate straightaway. If hardened and then re-softened by warming, a loss of quality is evident, as the two fats (butter and cocoa butter) will not combine as well as in the original method. A very gentle warming to working consistency in a suitably warm area gives reasonable results.

Preparations containing butter have a much shorter shelf life and are best only used in the cooler time of the year in articles which have a quick turnover.

Vegetable fats, which must be pure fats (100% fat, no water) with a low melting point (27°C), will assure better keeping properties.

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.

Couverture 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 as the chocolate sets 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 using a bain-marie.
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.

Example of fat bloom:



Couverture chocolate samples: tempered (left) and untempered (right) by [SKopp](#) under [CC BY-SA 3.0](#)

The image above shows two samples of dark (55% cocoa) couverture chocolate applied to ladyfinger biscuits.

The sample on the left was properly tempered and has a shiny finish. The sample on the right was not tempered but rather applied immediately after melting at a temperature of about 40°C, has a dull finish and displays grey fat bloom.

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, in as much as the cocoa butter is substituted with vegetable fat – is 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

Bain-marie (water bath) method

1. Break the compound chocolate into small pieces, and place in a stainless steel bowl.
2. Melt slowly over a gentle source of heat (bain-marie).
3. Stir occasionally with a clean dry spoon until completely melted, approx. 45°C.
4. Allow to cool slightly, before use.

Important points 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 (e.g. spices, etc.). 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.
- To avoid potential burns the gas flame on the stove top should be directly under stock pot not flaming up the sides of the pot.
- The bain-marie process requires your full attention to ensure the bain-marie remains stable on the stove top.

Melting chocolate in a microwave

A microwave is a convenient way to melt chocolate as it takes less time and can reduce Workplace, health and safety (WHS) risks in a busy bakery – as the process does not require the constant stirring over a stove top, as with the bain-marie process. It is important that you have been trained to use the microwave and that you follow the standard operating procedures (SOP). Ask your workplace supervisor or teacher if you are unsure.

The process for melting compound chocolate in a microwave oven includes placing the chocolate pieces in a clean dry microwave safe bowl. For best results and to ensure the chocolate is not burnt or scorched, it should be melted in 20 second intervals, stirring between each interval until the chocolate is melted to the desired consistency.

Fill and finish baked pastry products to meet end-product specifications

Remembering that in the introduction to this unit, it was outlined that if a finished pastry product, cannot be put up for sale because of its lower quality, or it doesn't meet a particular standard, it must be identified and either rectified or reported to a supervisor.

Inspections, control points, and corrective actions during all production processes are vitally important, as this ensures control on all processes, and a better quality and consistency of finished products.

How you prepare, transfer and store finished products will depend on whether they are being made ready for immediate consumption or sale, or in they are being made ready for storage (dry storage, refrigeration or freezing).



Practice activity

Activity 8.1: Product research - strudel

You are required to research strudel and find out the following:

- History of strudel
- Common finishing of strudel
- Common fillings and examples used in strudel
- Find at least two images of strudel

Write your notes about strudel.



Self-check questions

Activity 8.2: Check your knowledge

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

1. List three examples of techniques used to finish pastry products.

2. List two examples of pastry products produced using a pre-bake glaze.

3. Describe the process of post-bake glazing.

Topic 9

Complete work



Topic 9: Complete work

Completing your work is all about packing up, cleaning down, and ensuring your production schedule and workplace notes are updated and complete.

You will learn about the following:

- Clean equipment and work area to meet housekeeping standards
- Dispose of waste according to workplace requirements
- Complete workplace records according to workplace requirements

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 and your work area

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

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

- Understanding the toxicity of any cleaning materials you are using in material safety data sheets (MSDS) or safety data sheets (SDS).
- Using personal protective equipment to prevent skin reactions and injury.
- Working safely, especially with water near or with electrical equipment.
- Ensuring all equipment and products used 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.

The range of items used for cleaning bakery equipment and your work area are:

- industrial dishwashers
- cleaning cloths and tea towels

- dustpans and brooms
- mops and buckets
- garbage bins and bags
- separate hand basin for hand washing
- hand towel dispenser and hand towels
- sponges, brushes and succourers
- commercial cleaning and sanitising agents and suitable chemicals for cleaning bakeries, equipment and food storage areas.

Completing workplace records

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

- Accident/injury forms
- Maintenance requirements on equipment
- Production schedules
- Order forms for ingredients or stock needs
- Food safety documentation e.g. storage temperature readings
- Stock records e.g. 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.



Practice activity

Activity 9.1: Workplace requirements

Think about your workplace or the TAFE bakery.

1. What documents have you completed as part of your work producing pastry products and fillings?

2. How do you dispose of waste after producing pastry products and fillings?

Clean equipment and work area to meet housekeeping standards

Cleaning and care of equipment

To get the best use of equipment it must be kept in good repair and clean at all times. This is especially important as far as the handling of food is concerned. Care should be taken of all equipment right from the piping bag to the oven.

Find below some points that will assist you in achieving the maximum use of often-expensive equipment:

- **Food storage containers** should be cleaned, sanitised and dried before storing the empty containers or reusing them.
- **Knives and utensils** used to produce fillings should be cleaned, sanitised and dried before they are stored.
- **Brushes and piping bags** should be washed and dried before they are put away.
- **Mixing machines** should be serviced regularly. This will prevent the constant dripping of oil into the mixtures and loss of manufacturing time. Clean the machines daily.
- Baking trays are to be kept clean, both inside and out.
- **Pastry sheeter** should be dusted clean after use and the moving parts should be serviced at regular intervals. The safety guards must be operational.
- **Cool rooms and freezer** units should be defrosted regularly to ensure efficient cooling at all times and to prevent the motor from overloading and breaking down. Clean cool rooms and freezers regularly. Check door seals, walls and crevices for mould growth.
- **Scales** require careful maintenance and regular cleaning to ensure ingredients and products are always weighed correctly.
- **Sieves** should be washed and dried immediately after use.
- **Work benches** and all surface areas should be washed with detergent and then sanitised.
- **Cutting boards** should be cleaned and dried to prevent cross contamination.

Cleaning equipment

It is important that all equipment be kept clean for several reasons, to:

- maintain a safe level of hygiene
- prevent attracting pests to our work areas
- prolong the useful life of equipment
- reduce hazards caused by dirty equipment
- ultimately save on replacement costs.

Mechanical equipment will require specific cleaning protocols. These will be available from the manufacturer/distributor and your teacher will be able to demonstrate specific techniques to access parts of machinery that require cleaning.

Small pieces of equipment can generally be cleaned using the 5-step cleaning method:



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Small pieces of equipment that are made of metal can usually be placed in a warm oven to speed up the drying time. This will apply to flan rings, pastry wheels, tins, tart bases, etc.

Complete workplace records according to workplace requirements

It is good practice to keep records of production in the pastry kitchen or bakery. This may include aspects such as:

- Date and time of production
- The person who made the batch of products
- Baking parameters and time
- Yield

- Location of storage
- Variations to formulations

This will help with consistency by identifying faults or problems, or desirable developments.
This may also be a requirement of the food safety program at your workplace.



Self-check questions

Activity 9.2: Check your knowledge

Read the questions carefully.

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 ecologically?

Glossary

Below is common terms used in the Baking Industry. Feel free to add any new common words to this list during this unit then you can refer back to this glossary.

Term	Definition
Albumen	This is the name given to egg white.
Baking chamber	The baking chamber is the cavity or area of the oven in which the goods are placed for baking.
Blanching	Partly cooking by immersing in boiling water.
Blend	To mix together.
Blind bake	Baking a pie crust prior to adding the filling
Caramelisation of sugar	The browning of sugar by heating.
Carbohydrate	Sugars, fibres and starches found in vegetables, fruits, grains and dairy products.
Choux pastry	Refers to the cabbage like appearance of the pastry of the same name made with boiled water and butter, flour and eggs.
Damper/flue	An opening in the oven, which can control the steam either to stay in or be taken out.
Detrempe	First Stage of puff pastry production. Flour, water and salt are mixed together and slightly developed to form a smooth dough, before incorporating the fat, using the English, French or Scotch method.
Docking	Using a fork or similar tool to pierce raw pastry with small holes to prevent it from rising during baking. Used when blind baking bases for flans and quiches.
Emulsion	The mixing together of two ingredients, which are not easily mixed, such as fats/oils and water.

Term	Definition
Extensible dough	Also known as strudel dough, this is a specialist dough. The distinguishing feature of extensible dough is extensive resting time required (24hrs) and the paper thin pastry sheets created by carefully 'stretching' the dough rather than rolling it.
First in, first out (FIFO)	Use the oldest products first.
Flan	An open pastry case which is baked, then filled with is savoury or a sweet filling.
Ganache	A type of chocolate filling or finish made from chocolate, cream, milk or evaporated unsweetened milk, butter, and flavouring.
Gluten	Proteins found in grains such as wheat, spelt, rye and barley.
Gluten development	When the gluten forming proteins in the flour are mixed with water to form a rubbery elastic type substance.
Humidity	Refers to the amount of moisture in the atmosphere.
Hygroscopic	The ability to attract moisture, such as sugar attracting moisture from the atmosphere to itself.
Lecithin	The natural emulsifier found in egg yolks.
Matches	Matches are fingers of pastry, measuring approximately 120 mm by 55 mm. After baking they are split and filled with jam and cream, either whipped dairy or imitation cream or mock cream or chocolate ganache and fresh strawberries berries After filling they are then dusted with icing sugar.
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.

Term	Definition
Oven sole	The oven sole is the floor of 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.
Palmier	<p>Palmier is a French pastry that is similar to the shape of a palm leaf. It can be made with fresh or left-over puff pastry dough.</p> <p>When baked they can be likened to heart shaped pastries, often finished by icing with fondant or fudge icing, or sandwiched together with jam and cream and dusted with icing sugar.</p>
Panade	See Roux. The mixture of water, butter and flour used in choux paste.
Paste	The raw pastry.
Personal protective equipment (PPE)	Clothing and equipment used to ensure personal safety in the workplace.
Post-bake finish	Finishes applied after baking takes place. For example, when making pastry matches cream and jam is added after baking and cooling and dusted with an icing sugar finish.
Potentially hazardous food	Foods which must be kept at a certain temperature to ensure food poisoning bacteria growth is minimised.
Pre-bake finish	Finishes applied before baking takes place. For example, decorative pastry tops, egg wash, fruit finishes that need baking.
Resting the dough	Resting pastry requires you to cover it in cling or plastic to prevent a skin from forming and storing it in the coolroom for approximately 30 minutes. It is important that you allow the pastry to rest at various stages of processing to allow the gluten relax and loose some of its resistance to rolling. This process will also help minimise the risk of shrinkage of the pastry during baking.
Roux	The mixture of water, butter and flour used in choux paste. Also known as panade.

Term	Definition
Rubbing-in method	Term used for mixing fat into flour. The purpose of this is to coat the grains of flour and blend the ingredients, as in short-pastry.
Sauté	Fry in butter or oil without browning.
Scorching	To colour quickly using a culinary blow torch.
Scrap	The scraps of dough left after the first cut of the virgin dough. Referred to a simply 'scrap'.
Strong flour	Flour with high content of gluten.
Virgin dough	The first batch of pastry dough rolled or the first cut of the dough.
Wash	A type of pre-bake, finish made of eggs, milk or water, or a combination of these ingredients. It is usually brushed on baked products just prior to baking - to help to product shine.

Additional reading

You will find additional information on the topics from this learning guide in the following reference books.

You may find some or all of these books in your college library. As an enrolled student you are eligible to borrow these books. You may like to buy your own copy of any of these books by ordering through a retail bookstore in the area that you live or in the area where you attend TAFE.

Resource	Details
Library guide for Baking	<p>There is a range of print and electronic resources that you can access through the TAFE NSW Libraries.</p> <p>Go to the Library guide for your baking course to discover relevant resources, contact details for our libraries and other information and tools.</p>
Reinhart, P 2016, The bread baker's apprentice: mastering the art of extraordinary bread, eBook, viewed 24 September 2018, EBSCOhost eBook Collection.	<p>Access this resource</p> <p>Enter your TAFE username and password when prompted.</p>
Figoni, P 2011, How baking works: exploring the fundamentals of baking science, 3rd edn, eBook, viewed 24 September 2018, EBSCOhost eBook Collection.	<p>Access this resource</p> <p>Enter your TAFE username and password when prompted.</p>
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BAKERpedia n.d., viewed 24 September 2018, http://bakerpedia.com	<p>Wide range of information on bakery including free downloadable e-books</p> <p>Access this resource</p>

Resource	Details
Bakign Industry Research Trust n.d., viewed on 24 September 2018, https://www.bakeinfo.co.nz	Website that is run by the Baking Industry Research Trust in New Zealand. Has facts, hot topics, and information sheets. Access this resource
Baking Industry Research Trust n.d., Information Sheets, The Trust, viewed on 24 September 2018, https://www.bakeinfo.co.nz/Ask-Us/Library/Information-Sheets	Information sheets on the following: <ul style="list-style-type: none"> • Bread making methods • Bread making faults • Yeast • Gluten Access this resource
Bread Troubleshooting Guide- Progressive Baker n.d., viewed on 24 September 2018, http://fliphtml5.com/kfrj/jxak/basic	Information about bread faults and rectification. Access this resource
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The Food and Beverage Institute, 1998, The bakeshop: the basic steps of baking bread, online video, viewed 24 September 2018, https://www.youtube.com/watch?v=3jDCV_WMSQw	View this resource

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Plausch, G n.d., Premixes and complete mixes, Muehlenchemie, viewed 24 September 2018, https://muehlenchemie.de/downloads-future-of-flour/FoF_Kap_19.pdf	View this resource

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