

Student workbook

Produce sweet yeast and basic artisan products

Unit code and name:

FBPRBK3014 Produce sweet yeast products

FBPRBK3018 Produce basic artisan products



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Version: 1.0

Date created: 15/11/2018

Date modified: 26/02/2019

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RTO Provider Number 90003 | CRICOS Provider Code: 00591E

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Getting started

Welcome to unit FBPRBK3014 Produce sweet yeast products and FBPRBK3018 Produce basic artisan products.

This learner guide will provide you with knowledge about using sweet yeast and basic artisan products. You will be practicing your skills and knowledge in a Bakery Workplace or at your TAFE Campus in the kitchen/bakery. If you have any questions along the way 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.

Happy learning!

Learning outcomes

You will learn how to produce sweet yeast and basic artisan products in a commercial baking environment.

Throughout this unit you will learn the following:

- Preparing your work areas and yourself for work
- Safety and hygiene while working
- Equipment used for the production of sweet yeast and artisan products
- Ingredients and sweet yeast and artisan products
- Mixing dough for sweet yeast and artisan products
- Processing and baking for sweet yeast and artisan products
- Packaging and storing sweet yeast and artisan products
- Packing up and cleaning down after bakery work
- Workplace record keeping

Topics

There are five topics to in this learner guide:

Topic number	Topic name
Topic 1	Preparing for work
Topic 2	Ingredients and products
Topic 3	Production processes
Topic 4	Product quality
Topic 5	Pack up and clean down

Sessions

The following is a list of sessions planned for FBPRBK3014 Produce sweet yeast products and FBPRBK3018 Produce basic artisan products. Throughout these sessions, you will be learning about sweet yeast and basic artisan production through theory, discussion, demonstrations and practical activities.

Practical session	Outcomes
Session 1	Introduction to sweet yeast – crystal doughs (sweet doughs)
Session 2	Introduction to fruited and retarded crystal dough
Session 3	Bulk fermented and premix fruit dough
Session 4	Introduction to lamination Doughnuts – recycled fruit bread products
Session 5	Brioche, milk doughs and fillings
Session 6	Assessment

Practical session	Outcomes
Session 7	Continental
Session 8	Enriched – continental
Session 9	Display plaques
Session 10	Laminated
Session 11	Assessment preparation – croissant and plaque
Session 12	Assessment

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

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

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 and miscalculations can produce unwanted results and waste. All dry ingredients should be weighed (weight) rather than measured (volume). 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 are any weighing discrepancies, scales should be serviced and re-calibrated.

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

The Australian Government also has trade measurement laws that 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.](#)

In this learner guide we will also cover 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 can't 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 products.

Checking may be as simple as inspecting dough mixture to make sure it is mixing to meet the product requirements, or that after dividing and moulding all your pieces they are the right size and shape. You can 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 are important steps during all processes of creating sweet yeast and basic artisan. You will learn to recognise when things don't go as expected.

Variations will occur for many reasons:

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

If a finished product doesn't meet expectations, you will need to record that on the production schedule as this may indicate a problem with the recipe formula, equipment or ingredients.

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








Maintain records




You will need to know the product types and amount that you will be producing whenever you start work. A production schedule will be used in your workplace to clarify what needs to be produced. You will find an example of a production schedule in the appendices section at the back of the learner guide.

The production schedule may include the following:

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

Icon legends

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

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

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 following:

- Regulatory requirements for producing sweet yeast and artisan products
- Preparing the work area to meet food safety and workplace health and safety requirements
- Protective equipment for working safely
- Equipment and readiness for use
- Production scheduling – techniques and considerations
- Minimising waste in recipe formulation

To learn about this topic:

- Read the information
- Do any practice activities as instructed by your teacher
- Do the self-check questions
- Talk to your teacher if you need some assistance with this
- Take a look at the additional resources

The baking industry

Regulatory requirements in the industry

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

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

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

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

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

- Regularly clean surfaces, equipment and utensils
- Wash hands between tasks
- Clean up spills on the floor immediately
- Maintain high standards of personal hygiene
- Store food items correctly

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)

Safety in the kitchen is the most important thing you will do. Accidents harm employees, cost money, and lead to time off work and higher insurance policies. Some accidents permanently injure staff and as a result they cannot continue to work. The steps you need to take to ensure the safety of yourself and others are very important.

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

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

You will learn about the safety requirements of working in a bakery throughout your course.



Practice activity

Activity 1.1 : Working safely

Describe the steps you would take if you burnt yourself in the workplace.

Equipment

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

It is important to follow workplace procedures for using, cleaning, maintaining and reporting equipment malfunctions.

Let's look at equipment used in the bakery.

Equipment and accessories	Tools and utensils	Ancillary equipment
<ul style="list-style-type: none"> • Industrial oven • Industrial mixer and attachments • Pastry sheeter /dough break or rolling pin • Deep fryer 	<ul style="list-style-type: none"> • Plastic and metal scrapers • Oven gloves • Containers used to store fillings • Bowls and measuring jugs • Piping bags • Piping nozzles • Glazing brushes • Knives for decorating and cutting 	<ul style="list-style-type: none"> • Baking trays • Cooling wires • Dough and pastry benches • Dried fruit storage containers • Jugs for storing glazes • Dry ingredient storage containers

Mixers

While you can mix dough by hand pummelling, whipping or slapping the dough, mixers are best for producing larger quantities. There are three main types of dough mixers in common use in the baking industry: low intensity, medium intensity and high intensity mixers. Mixing machines should be serviced regularly and safety guards must be operational. This will prevent loss of manufacturing time and the constant dripping of oil into the mixtures.

Low intensity mixers

Low intensity mixers usually take 20-30 minutes to mix and develop a dough. They are not efficient dough developers especially with high protein flours. The addition of gluten strengtheners and softeners would be used to help develop the dough in these mixers.

Medium intensity mixers (e.g. spiral mixers)

Medium intensity mixers, such as spiral mixers, take 10-20 minutes to develop a dough. This process may utilise softeners but the amount required is generally much lower than the high intensity mixers. The type of flour may also govern the amount of gluten softeners. For example, higher protein may require addition of gluten softener but a low protein flour may not require any. Gluten softeners generally allow for a reduction in the mixing time.

High intensity mixers

High intensity mixers, such as Tweedy, take 1½ - 4 minutes to process the dough depending on the dough type. This is often referred to as Mechanical Dough Development (MDD). These types of mixers impart a lot of energy to physically develop the gluten. They do not need gluten softeners to help dough development but require additional strengtheners to stabilise the developed structure. This is referred to as Chemical Dough Development (CDD).

Ovens

Travelling ovens

Also called tunnel ovens, these ovens consist of a metal belt that passes through a connected series of baking chambers which are open at the end. The product moves through the oven as it bakes. This oven is continuous, completing a cycle with loading and unloading at the same point and no-down time between batches. The power source can be oil, gas or electricity.

Reel ovens

These ovens are popular in small bakeries where space is premium. This type of oven has a revolving wheel equipped with suspended trays holding the dough pieces. The products rotate on a vertical plane through a horizontal axis and are quickly heated and steam can be added.

Rotel ovens

These are very popular in small in-store bakeries, where space is important. Baking surfaces rotate which ensures even bake of the whole tray of products. This type of oven can be 'decked', for example single through to four decks.

Rack ovens

These ovens have a vertical baking chamber and a special rack is wheeled in carrying multiple trays of product. The rack hangs from or rests on a turntable that rotates during the baking phase, allowing for uniform convection heating. They are available in single, double or quad racks. They may be heated either by gas, oil, or electricity. Some are fitted with computerised controls which regulate steam conditions and baking cycles.

Multi deck 'setter' oven

This oven is specifically designed for 'hearth' type breads with high-pressure steam injection. There is usually limited use, approximately 8-10 loaves per deck, and has individual steam injection into each deck. Hearth loaves are placed into the oven using a 'setter' or moving belt, which reduces the incidence of loaf damage or distortion.

Convection oven

This oven has a fan included that tends to equalise the temperature within the oven. These ovens can be gas or electric.

Pastry sheeter/dough brake

A dough brake (sometimes called a dough sheeter or pastry sheeter) is a piece of machinery used in bakeries to roll dough or create pastry sheets. They enable a consistent thickness of the dough or pastry. Dough breaks should be dusted clean after use and the moving parts should be serviced at regular intervals. The guards must be operational.

Prover

Bakery provers are used before the final baking stage and help bakeries to improve the fermentation process and have some control over the production process. Warmth and humidity in the prover enables the dough to rise quicker. The prover door is to be left open after the prover has been used. This is to allow the inside to dry and reduces the risk of the seals deteriorating and bad odours tainting products.

Deep fryer

Some sweet yeast goods, such as doughnuts and churros, are fried rather than baked and a deep fryer is used to enable the frying of multiple products at the one time. Fryers should be emptied at regular intervals, and the frying medium should be as fresh as possible and regularly filtered.

Cool rooms

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.

Other equipment

Scales

Careful maintenance and regular cleaning of the scales will ensure ingredients and products are always weighed correctly.

Ingredient storage bins

Ingredient storage bins help to keep ingredients free of infestations and contamination. Ensure lids are securely fastened to avoid spoilage and waste of ingredients.

Knives

A range of different knives are required for use in the bakery. Knives are used for dividing dough as well as scoring dough prior to baking, dicing and slicing ingredients for fillings and toppings, and decorating. Knives should be well maintained and care should be taken in using, cleaning and storing to avoid injuries.

Dough scrapers

Dough scrapers are tools used by bakers to work with dough and to clean surfaces where dough has been worked. They are generally a small sheet of stainless steel or plastic with a handle of wood, plastic, or simply a roll in the steel blade along one of the long sides.

Baking trays

Dough pieces are placed on baking trays for baking in the oven. Trays are usually metal and of various shapes, usually rectangular or square. They are prepared by greasing, spraying or papering prior to having dough pieces placed on them. Baking trays are to be kept clean, both inside and out.

Wire racks

Wire racks or cooling wires are used for cooling finished products. These should be washed and dried before use.

Brushes

Brushes are used for glazing or spreading egg wash onto the dough piece prior to baking. Brushes usually have natural, nylon or silicone bristles. Brushes and piping bags should be washed and dried before they are put away.

Piping bags and nozzles

Piping bags are used for decorating and are usually made from cloth, paper or soft plastic. The bag is cone-shaped and used to pipe semi-solid food items such as cream, icing and pureed toppings onto the dough piece. Nozzles are used to obtain desired shapes for visual effect. Piping bags and nozzles must be washed and dried thoroughly to avoid contamination.

Bowls and measuring jugs

Good quality bowls of different sizes and measuring jugs are used to mix ingredients and measure liquids and are required in the bakery to measure and store toppings and glazes, until ready for use. These are usually made from glass, ceramic or plastic.

Storage containers

Storage containers are used for storing dry and prepared fillings. It is important that they have well fitted lids to ensure food items remain airtight to avoid contamination by vermin or ruined by exposure to air/moisture.

Sieves

Sieves or sifters are used for separating unwanted material from a substance. Wash and dry sieves immediately after use.

Cutting boards

Cutting boards should be cleaned to prevent cross contamination.

Benchtops and tables

Benchtops, tables and all surface areas should be washed with detergent and then sanitised.

Personal protective equipment

It is very important that you know about the personal protective equipment available in your 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 oven gloves. Protective equipment helps protect you from injuries and ensures hygiene is of a high standard.

Cleaning and care of equipment

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

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

To ensure the longevity of equipment, keep in good repair and clean at all times. This is especially important for handling food.

Here are some tips for maintaining equipment:

- Small pieces of equipment made from metal can usually be placed in a warm oven to speed up the drying time
- Small pieces of equipment can generally be cleaned using the 5 step cleaning method:



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Production scheduling

A production schedule is an important document that tells you what needs to be produced and how much of it is needed. Throughout your course practical activities will be expected to complete production schedules before you commence work and when you finish your work.

A production schedule will include the following:

- Product processing requirements — what needs to be produced by when
- Recipe formulation to minimise waste
- Finishing parameters for products — timings and temperatures
- Bake parameters for sweet yeast and artisan products

Example production schedule:

Dough no.	Type of dough	No. of pieces	Weight (kg)	Shape required	Weight for each	TDW	Notes
1	Milk dough	3	0.450	Small lunch loaves			
		9	0.800	4 piece squares			
2	Fruit loaves	3	0.800	4 piece squares			
		1	2.400	Scrolls			

Dough no.	Type of dough	No. of pieces	Weight (kg)	Shape required	Weight for each	TDW	Notes
3		3	0.510	Viennas			
		15	0.150	Plaits			

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 differences in the amount of baked items produced for the formula or if there were any faults or discrepancies and how you addressed these.

You will find an example of a production schedule in the appendices at the back of the learner guide.

Topic 2

Preparing for work



Topic 2: Ingredients and products

This topic is about the ingredients used in making sweet yeast and basic artisan products.

In this topic you will learn about:

- Storage and handling of ingredients
- Sweet yeast products
- Basic artisan products
- Ingredients and their purpose in baking artisan products and sweet yeast products
- Fillings and toppings for artisan products and sweet yeast products

To learn about this topic:

- Read the information
- Do any practice activities as instructed by your teacher
- Do the self-check questions
- Talk to your teacher if you need some assistance with this
- Take a look at the additional resources

Sweet yeast products

Basic sweet yeast products are made from a dough that has a higher percentage of sugar and a basic fat such as vegetable oil, margarine and or shortenings. These percentages can be as high as 10%. Some basic sweet doughs can also have enriching agents such as milk powders, spices and a variety of dried fruits such as sultanas, currants and mixed peel. Most of these products are usually finished with a basic cream, icing or fondant finish.



Chelsea and Boston buns
(filled sweet yeast
product)



Hot cross buns (a fruited
sweet yeast product)



Spiced sweet yeast bun or
loaf



Cream buns (Chantilly cream decorated sweet yeast bun)



Finger buns (iced and decorated sweet yeast bun)



Doughnuts (fried sweet yeasted or cake style with endless decoration styles)

Chelsea and Boston buns, Hot Cross buns, spiced sweet yeast bun, cream buns, finger buns: © TAFE NSW
Doughnuts by [Rod Long](#) under [Unsplash licence](#)

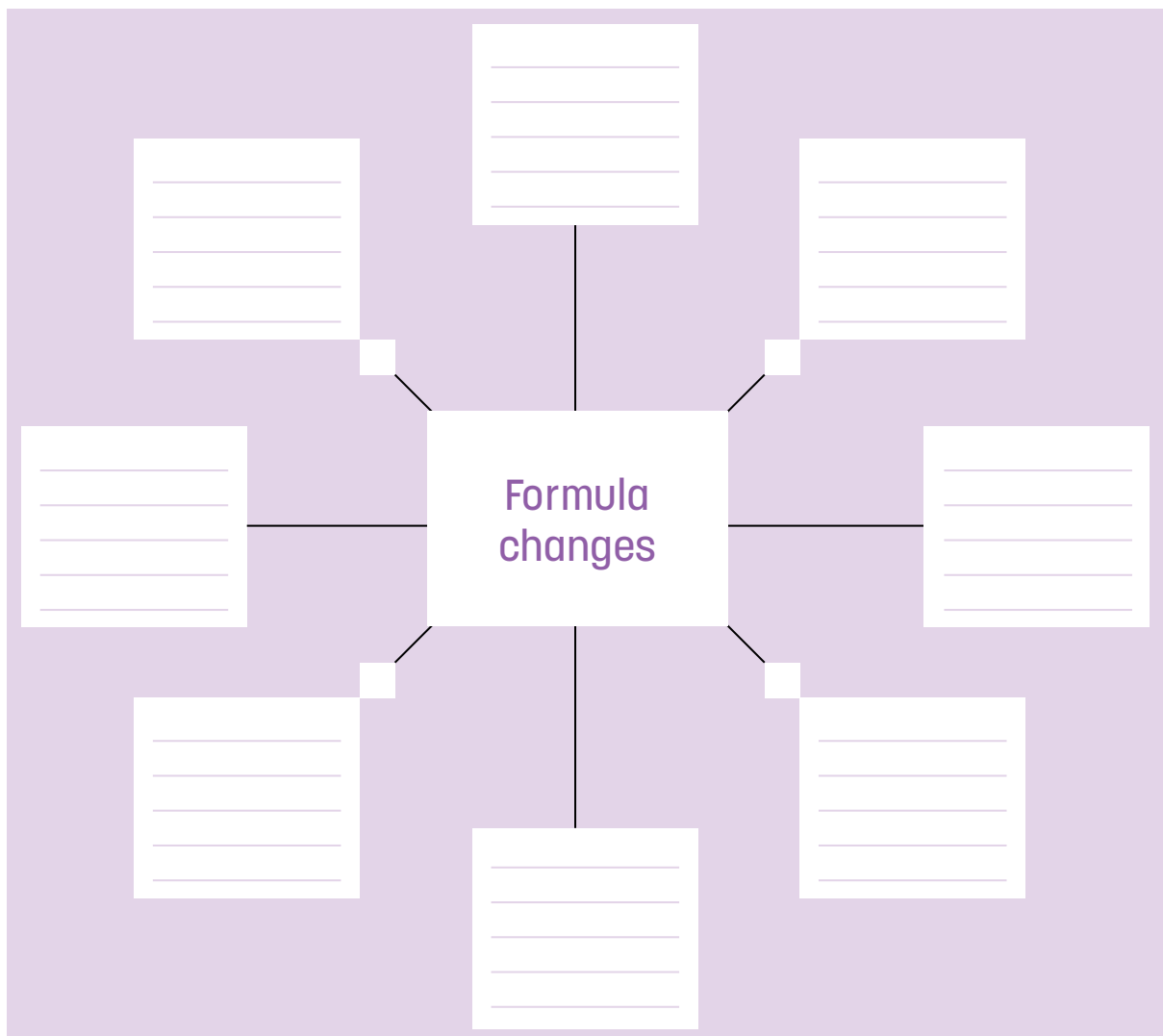


Practice activity

Activity 2.1: Formula changes

When baking, it is necessary to understand principles of each ingredient and how it will affect production when we increase ingredient percentages.

On the mind-map below, write all the formula and processing changes necessary when making sweet doughs in comparison to basic bread production.



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Practice activity

Activity 2.2 : Sweet yeast products

Research a type of sweet yeast product. Perhaps choose one that you will be making as part of your skills assessment.

Make some notes about the ingredients and what their function is in the formula/recipe. What you might need to keep in mind when making this product?

Basic artisan products

A current trend is for products known as basic artisan or enriched sweet doughs. The fat used is replaced with unsalted butter and can be as high as 50% in a product such as a pan de muerto (Mexican bread of the dead). In enriched doughs a percentage of water is often removed and replaced with whole eggs and/or egg yolk. More variety in dried and fresh fruits are used such as figs, dates and fresh fruit garnishes, nuts, spices, alcohols and fillings and toppings.

Whenever we increase the fat content, and more commonly butter, we are enriching the dough as we are adding quality or value adding to the flavour.



Milk doughs: Lean plaited breads. 5, 4 and 3 strand pictured.



Austrian plaits: Enriched plaited dough oven finished with pearl sugar and almonds.



Laminated: Croissant crescent shape.



Laminated: Pain au Chocolate (chocolate croissant) usually containing between 2 and 3 specialised chocolate sticks. It is not uncommon for 1 of the sticks to be replaced with marzipan



Laminated dough: Danish Pastry with passionfruit flavoured crème patisserie and fresh fruit.



Cronut: Laminated pastry deep fried into a doughnut style product. Can be split and filled with a variety of products. This image shows a vanilla citrus crème pat on top.



Streusel Kucken: a German bread made with a streusel topping. Can contain stewed fruit underneath the crumble topping.



Bienenstich (bee sting): enriched dough topped with an Almond topping filled with crème patissiere.



Brioche tart: A crème fraiche custard with fresh fruit (berries) baked into it. (High moisture fruits are not good for this style of product.)



Gugelhupf: a European yeast raised cake made with fruits, spices, nuts and syrups. There are many versions of this cake from different countries and regions.



Stollen: a dense German Christmas bread with a high percentage of fruit and contains a strip of marzipan filling



Plaque dough.

Basic artisan products: © TAFE NSW



Practice activity

Activity 2.3: Artisan products

Research and select a type of sweet yeast product. Perhaps choose one that you will be making as part of your skills assessment.

Make some notes about the ingredients and what their function is in the formula/recipe. What do you need to consider when making this product?



Practice activity

Activity 2.4: Timings

What production timing would you need to consider when making sweet yeast or artisan products?

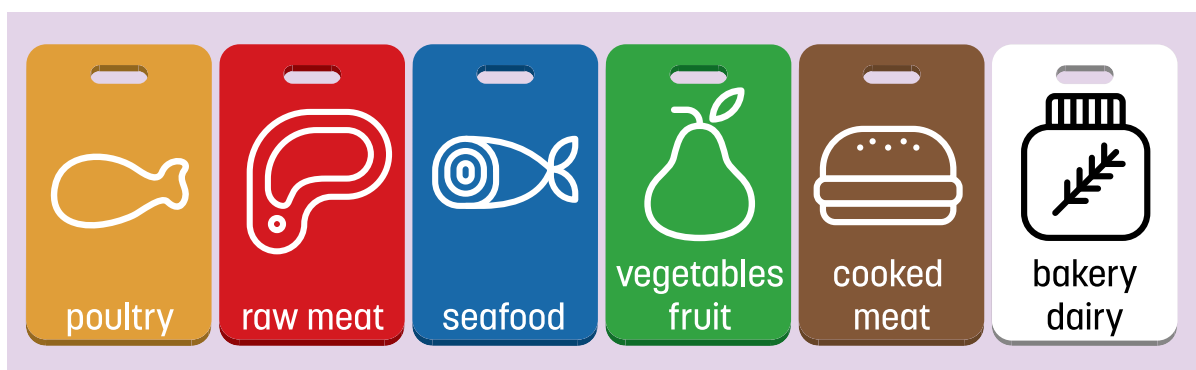
Food and ingredient storage

Ingredients must be stored properly in the correct areas to maintain their quality. FIFO (first in first out) principle can be applied when storing finished products and perishable ingredients.

The longer a perishable product is stored, the less useful it becomes. Moisture loss, decay and bacterial actions may eventually spoil the product. The storage temperature also affects these conditions. Regulated temperatures assist in preserving food but also retard the ability of harmful bacteria to multiply.

It is important to adhere to all food safety requirements when storing prepared ingredients. This includes:

- Storing at the correct temperature
- Ensuring accurate labelling including date and time prepared, date opened and use by dates
- Preventing cross contamination – especially when using dairy, meat, poultry, fish and vegetable products. Clean utensils after each use with a product and use appropriate cutting boards for correct ingredients



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

There are three types of storage, and temperature control is important in all three:

1. dry
2. refrigerated
3. frozen.

Dry storage

Dry storage is for foods that do not require refrigeration and have a long shelf life under existing room conditions. The goods stored in this include tinned goods, flour, sugar, oats, dried fruit and any item that does not need to be stored in a cold environment.

Refrigerated storage

Ingredients that are perishable are stored in refrigerated rooms called a cool room or in a refrigerator unit.

All dairy products, eggs and fresh fruit, as well as finished products like custard, cream, pre-prepared doughs for croissants, and Danish are stored in a cool room. The temperature to be maintained is between 0°C and 5°C.

Freezer storage

All frozen food products are kept below 0°C. Most common freezer storage is set at –18°C. Foods stored in a freezer include fruit and finished products like Danish pastries and par baked goods. Goods stored in these conditions should be packed for protection of the product and dated to keep track of products being stored.

Storing food: General rules

Best practice advice for food safety can be found in the [Australian and New Zealand Food Standard 3.2.2 Food Safety Practices and General Requirements](#).

Below is an extract on best practice food storage requirements.

1. Food should be stored in containers or other wrapping that is food-grade (i.e. safe for food use).
2. Packaged food should be regularly inspected to make sure it remains intact and properly protecting the food. Any food that might be contaminated because packaging is unsuitable or damaged should be disposed of.
3. Raw food such as raw meat and seafood should be stored separately from or below ready-to-eat foods, to avoid contamination from the raw food (e.g. meat juices) being transferred to the ready-to-eat food.
4. Food should be stored separately to chemicals (e.g. cleaning agents and pest control poisons).

5. Food should be stored off the ground on shelves to help keep premises clean, discourage pests and avoid water damage or contamination in areas where floors are wet cleaned.
6. Food should not be stored in toilet facilities. It is also good practice to avoid storing food contact equipment and food packaging in toilet facilities.

Ingredients in baking sweet yeast and artisan products

Flour



Flour in a jar by [kaboompics](#) under [Pixabay licence](#)

Flour is a powdery substance produced by grinding dry grains such as wheat. Most flours used in baking come from grinding wheat. The two most important parts of flour in are:

1. Proteins (gliadin and glutenin) which combine to form gluten.
2. Starch when broken down by enzymes, starch is converted to simple sugars that provide food for yeast. Starch has setting properties known as gelatinisation.

Flour quality can vary depending on the following:

- Wheat variety
- Climatic conditions

- Type of soil in which the wheat is grown
- Condition of the wheat when milled
- Milling techniques

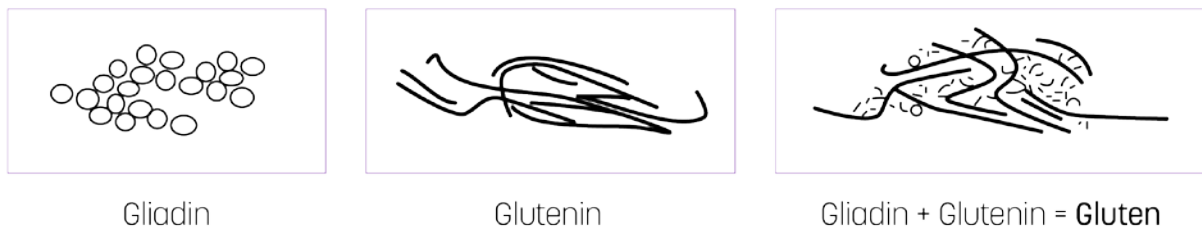
Storing flour

Flour should be stored in a cool, dry and preferably in an airtight container. Flour should be purchased in quantities that will be used within a maximum of two to three months. It is also important to make sure any storage bags or containers are secure to avoid infestation by moths. Avoid mixing new flour with old if you are not using the flour regularly. If it is necessary to store flour for extended periods of time, it is best to keep it in the freezer.

Gluten

Wheaten flour contains two proteins gliadin and glutenin, which when hydrated, form a 3D rubber-like elastic mass called 'gluten'. The protein mixture present in wheat flour is unique as it enables gasses resulting from fermentation to be retained. This retention and the ability of the gluten protein to stretch give us the basic structure of well-aerated, soft-textured bread.

Below is a visual representation of gluten.



© TAFE NSW

Most production making processes require changing and improving (modifying) the natural properties of the gluten. This enables better gas retention within the dough structure as it expands and the cell walls become thinner.

Traditional bread making is based on the changes of gluten properties occurring during bulk fermentation of the dough over a period of several hours. Periods as long as 12-48 hours fermentation may be used. When higher amounts of gluten strengtheners are used gluten modification occurs in a much shorter period of time.

One of the main objects of the dough mixing process involves gluten modification (gluten development), the restructuring of the gluten in the flour. The gluten present in the flour is associated with individual flour particles and occurs in spiral form. During the dough mixing process we aim to string out the strands and recombine them into a three-dimensional network capable of retaining the gas produced by the yeast. The starch and the other materials are also evenly dispersed throughout this network which is achieved by mixing too.

We can tell that the gluten has been well formed when mixed by doing a window test. This involves gently stretching the dough to test that it doesn't tear and you can see the light through it. You will also be able to see the gluten strands.

This expansion and stretching of the cell walls continue in the baking of the dough. Initially the gluten is responsible for supporting the dough structure, but the heat in the oven causes the starch to gelatinise and the gluten is denatured. The gelatinised starch sets and the bread becomes self-supporting.

Types of flour

The following table shows some of the common flour types used in the producing sweet yeast and basic artisan products.

Flour type	Description of use
Bakers flour	Bakers flour is sometimes referred to as 'strong flour' and has a gluten protein content between 10-13%. This level of gluten content is ideal for sweet bread production.
Rye flour	Rye flour is different from wheat flour as the protein is different. The glutenin of rye is responsible for the inability of rye to form a gluten structure so the dough has 'plastic' properties rather than 'elastic' properties. This flour will be used to produce your modelling dough.
Corn flour	Also known as corn starch or maize starch, this is the starch extracted from corn (maize) grains. Corn starch is used for thickening custards, making corn syrup and other sugars. It can be used in doughnut to soften the gluten content and prevent blow outs in the frying process.
Pre-mix bun flour (sweet doughs)	Pre-mix flours are already mixed with all ingredients except the yeast and creates a pre-mix dough.

Water

Water plays a major role in the baking process, both in the dough development stage and in the baking stage. Water also:

- assists with yeast growth and helps disperse the ingredients throughout the mixture
- helps evenly disperse ingredients
- controls temperature which is necessary for good gluten development, ensuring the ideal FDT (finished dough temperature)
- necessary to hydrate gluten which allows the dough to become elastic and pliable
- dissolves ingredients, such as, sugars, salt and soluble proteins and assists to distribute them evenly throughout the dough
- allows enzyme action, which is essential for good yeast activity and adequate gluten characteristics
- is necessary for the gelatinisation of starch. As the dough piece begins to heat up in the oven yeast activity accelerates. This results in increased gas production and gives volume to the product. As the water in the dough continues to heat up, the starch changes from a soft tacky putty to an expanding stable jelly. This process is known as gelatinisation, which occurs between 60°C and 88°C and is responsible for the soft crumb of the final loaf. As the water is heated further, it turns to steam and is driven off, resulting in crust colour formation and a dry crisp crust with an attractive appearance and flavour.

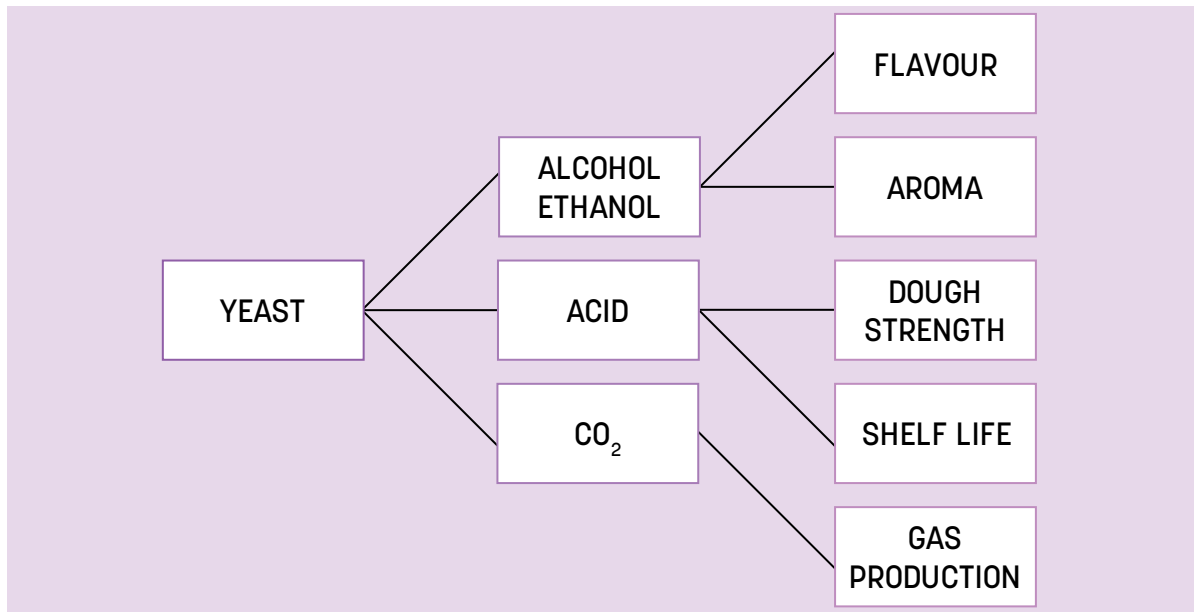
Yeast

Yeast is a single-cell micro-organism used in bread making which is capable of fermenting certain sugars to produce carbon dioxide and alcohol. In bread making, yeast has two prime functions:

1. to produce carbon di-oxide gas (CO₂ gas)
2. to condition or ripen the gluten in the dough.

It is important to understand fermentation properties of yeast for sweet and basic artisan breads as the ingredients used will all have an impact on the fermentation process.

The following diagram shows the relationship between yeast and the quality of the finished product.



© TAFE NSW

Temperature affects yeast growth as follows:

- If yeast is heated beyond 60°C it will die.
- Yeast is most active at 32-35°C.
- Yeast produces gas at a controlled rate at 25-30°C.

There are three different types of yeast used:

1. **Compressed yeast** - fresh yeast having a firm consistency and formed into a block. Requires refrigeration but can be added directly to the dough.
2. **Creamed yeast** - fresh yeast in liquid form. Primarily used by plant bakeries and stored in large refrigerated stainless steel tanks. Normally added directly to the dough via metering equipment.
3. **Active dry yeast** - yeast having a low moisture content and extended shelf life but having a lower activity than compressed yeast. Must be rehydrated before use.

Salt



Salt by [Onefox](#) under [Pixabay licence](#)

Salt is one of the four basic ingredients used in creating a dough. Salt has two significant functions:

1. Controlling the fermentation process
2. Flavour of final product

In the production of sweet dough, salt is reduced to 0.5 – 1% mainly because of the high percentages of sugar and fat in the dough. Any more than this amount will drastically slow down fermentation. This is enough to aid in the strengthening of the gluten without inhibiting the fermentation process. We need a small percentage of salt to strengthen the gluten as this helps in the entrapment of carbon dioxide CO₂ gas in the gluten matrix during the fermentation process. If there is a lack of salt present in the dough the fermentation process will speed up, over ripen the gluten and will create a build-up of unwanted acids within the dough.

The flavouring quality of salt is not as needed in the production of sweet yeast or basic artisan products, as the flavour comes from the high sugar and fat content.

Enriching agents

The addition of extra sugar, eggs, fat, fruit, makes the dough richer and sweeter. Dough has to be handled differently and mixing methods, proving and baking conditions all require adjustment when the dough has been enriched. It is the addition of these extra ingredients that improve the flavour and final appearance of the product. The key enriching agents are eggs, sugar and fat.

Sugar



A spoon in a bowl of sugar by [Unknown](#) under [CC BY 1.0](#)

There is a wide range of variety in sugar, all belonging to the group of compounds known as carbohydrates. Carbohydrates are organic compounds and contain the elements carbon, hydrogen and oxygen. Sugars are hygroscopic and require dry and well-ventilated storage. They are not subject to weevil infestation but should be protected from ants and flies.

Sugars are classified by molecule type.

The three classifications of the sugars most used in bakeries are:

1. Monosaccharides (mono = single; monosaccharides = single unit sugars such as glucose or dextrose, fructose, galactose)

2. Disaccharides (di = two; disaccharides = two unit sugars such as sucrose - plant sugar, maltose, lactose - the sugar of milk)
3. Polysaccharide (poly = many; polysaccharide = many unit sugars)

Sugar has the following effects on the finished product:

- Sweetens - gives palatability to the finished goods.
- Food for yeast - provides yeast with a food source in the fermentation process which results in a faster rise.
- Improves crust colour - caramelisation aids in browning the crust.
- Softens the crumb - absorbs water leading to a tender finished product.
- Used in many ways for creams, icings, garnishing or dusting to finish products with improving eye appeal.

Types of sugar

The following table lists different types of sugar and their usage.

Sugar type	Characteristics	Usage
1A sugar	Medium/granulated	Used in goods with a long mixing cycle, fruit fillings, sugar boiling, some biscuits and toppings.
IXD	Hard, large granulated	Used for finishing work i.e. top of fruit buns etc.
Caster sugar	Fine granulated	This dissolves more readily than 1A so is in more demand in short cycle mixes. As it dissolves readily, it is used in the creaming process to pull air into the mix.
Pure icing sugar	Finely milled powder	Used for royal icing production: butter creams, short breads where there is no added moisture.
Icing mixture or soft icing	Finely milled adulterated powder	This has starch added to prevent it from going hard. It is used fudge icing, mock creams, water icings and dusting product.

Fats and shortenings

Fats and shortenings are used in larger quantities in producing sweet and basic artisan products, in comparison to basic breads. Fats and shortenings improve the keeping qualities of a product and add flavour.

When producing sweet yeast products, you will use a cheaper fat such as an oil, margarines or shortenings, which all increase the flavour. When producing basic artisan products, the fat is increased above 10% and butter is then the best fat to use as it provides better flavour to enriched products.

The beneficial effects of fat are listed below:

- Improved keeping qualities/shelf life
- Crumb and texture quality
- Assists laminating process
- Crust character- short crisp and brittle instead of tough, hard and leathery
- Assists volume and slicing
- Assists dough handling properties

Fats and shortenings used in sweet and basic artisan products include the following:

Fats/shortenings	Description and how it is used
Margarines	Margarine is a mixture of refined fats and oils blended with milk and brine, with or without the addition of colours, flavours and emulsifiers. While butter is considered the ideal edible fat, margarines have distinct advantages. They are more stable, less prone to rancidity, have a longer shelf life and do not usually require refrigeration.
Vegetable oil	Vegetable oils or vegetable fats are fats extracted from seeds or other parts of fruits. Like animal fats, vegetable fats are mixtures of triglycerides. Margarines and shortenings are more commonly used than oil in sweet doughs.
Shortenings	Shortenings are blends of refined fats and oils, which are processed for desired texture and performance. They can be either a vegetable blend, a blend of animal fats, or a blend of both.

Fats/shortenings	Description and how it is used
Hydrogenated fats	Some fats are made by the hydrogenation of oils, which turns them into fats.
Butter Unsalted	Butter is a natural product made by churning the fat solids in milk. Butter has a low melting point and for storage it is best kept in the refrigerator. Butter helps to create a superior flavour in baked products. Unsalted butter is best to use for the production of sweet yeast products. Lamination butter makes the production of croissant and Danish easier to work with.
Specialty Margarines (laminating)	Speciality margarines are designed to be used for certain products. For example, Danish pastry margarine which has a soft consistency, but is still capable of withstanding the rigours of rolling and folding.

Eggs



Eggs in a carton by [Monicore](#) under [Pixabay licence](#)

Eggs are important in baking as they provide enrichment to the dough of sweet yeast and basic artisan products. The following is a list of the benefits of using eggs in baking:¹

- improves the food value of the product
- the water content of eggs will help to bind dry ingredients together
- the protein content of egg will set during baking, helping to provide the structure of the product
- improves colour of products
- powers of emulsification in eggs may improve the keeping qualities of products
- adds flavour
- natural source of nutrients including, omega-3 fatty acids, vitamin A, E and B12, antioxidants and choline.

It is important when adding eggs that the hydration levels are correct as the egg proteins combine with the gluten to provide strength to the dough. During fermentation, especially bulk fermentation, the dough will tighten too much and result in a dry crumb if the hydration levels are not accurate. The egg has three main parts:

1. Shell – Approximately 10% of the total weight:

- calcium
- phosphate

2. Yolk – Approximately 30% of the total weight:

- water
- fat
- protein
- minerals

3. White – Approximately 60% of the total weight:

- water
- protein
- minerals

¹ <https://www.australianeggs.org.au/nutrition/> (accessed 17/12/2018)

Eggs are available in various forms:

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

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

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

Storing eggs

Eggs are best stored and handled as follows:²

- Refrigerate and keep in cartons as this reduces water loss and prevent flavours from being absorbed into the eggs.
- Eggs can be kept refrigerated in the carton for up to 6 weeks.
- Avoid cross contamination when using eggs by washing hands, cooking instruments and bench tops.

² <https://www.australianeggs.org.au/facts-and-tips/storing-eggs/#item-57> (accessed 17/12/2018)

Milk and milk powders



Milk in bottles by [Daria-Yakovleva](#) under [Pixabay licence](#)

Milk is available in various forms:

Liquid	Powdered
<ul style="list-style-type: none">• Fresh pasteurised full cream (homogenised)• Fresh pasteurised skimmed milk• Evaporated milk — condensed milk (sweetened and unsweetened)	<ul style="list-style-type: none">• Full cream milk powder• Skim milk powder

Pasteurisation of milk

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

Homogenisation of milk

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

Milk powder

There are two types of milk powder:

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

Skim milk powder has a lower butterfat content than full cream milk powder. See table below.

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

Making liquid milk from milk powder

Follow these steps to making liquid milk from milk powder.

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

Whole or skim milk powder – ingredient reaction

When skim milk powder is added to the dough there will be a reduction in the speed of fermentation. When adding full cream, skim milk or milk powders to dough the milk or milk powder should be heat treated to kill the enzyme called Glutathione.

Glutathione is a whey protein fragment that works like the protease enzyme does to weaken protein bonds, and to some degree disassemble them. High-heat dry milk is manufactured specifically for bakers who want the convenience of using a dried product and because they know it was held at 88°C for 30 minutes before the drying process takes place. The glutathione is a catalyst for chemical reactions, and when treated this way it will no longer affect the gluten bonds. If this process is not achieved or you use fresh milk that is not heat treated, the fermentation will be decreased dramatically and volume of the final product will be reduced.

Milk protein

The main protein contained in skim milk powder is casein. This protein is extremely tough and the addition of 4% skim milk powder to dough increases the protein content of the dough by approximately 1 kilo per 100 kg of flour. When this protein combines with gluten protein, the dough produced has much tougher characteristics than that of milk free doughs.

The result of this reaction is to extend the fermentation tolerance of the dough and at the same time cause an increase in its water absorption properties. To overcome the toughening effect, extra mixing time is required in comparison to white breads.

Mineral content

Calcium is part of the mineral content of skim milk powders and is alkaline. So, when added to a dough mixture, it will reduce the acid concentration in the mixture and the following reaction will occur:

- Milk free dough usually ferments with an acid content of approximately 5.1 to 5.2 pH.
- Milk dough never has an acid content higher than 5.72 pH.

The higher the pH figure (0-14), the less the acidity. The lower acid content of milk dough reduces the diastatic amylase activity of the dough, which means that less sugar is produced from starch by the amylase enzyme. The result of this reaction is a slowing down of gas production especially towards the end of the bulk fermentation and during the final tin proof.

Water absorption of doughs

Dough tightens up during the fermentation period, so when skim milk powder has been added, it should be finished slacker compared to when no milk powder is added. This is due to the absorption of moisture by the skim milk powder and to the toughening effect of the milk protein, casein.

Formula variations

When non-fat milk solids are added to bread doughs in amounts of 4% or more then the following dough characteristics are effected:

- Fermentation speed
- Mixing time
- Water absorption
- Yeast activation

To overcome these reactions it is necessary to adjust the amount of standard ingredients to be used in the dough and to add some other ingredients, such as sugar, so a balanced dough formula is achieved.

The retarding influences of skim milk powder in bread dough fermentation can be overcome by the adjustment of the dough formula.

The following adjustments are recommended:

- Increase in the percentage of yeast used in the dough
- Add sugar
- Increase water content
- Increase mixing time

The sugar content of skim milk powder is not fermented by yeast during dough fermentation. This is because the enzyme that changes milk sugar to a simple sugar is not present in the dough. The milk sugar remains as a residual sugar in the dough at the time of baking. It is this sugar that creates the colour to the crust of products.

The addition of skim milk powder to doughs will have the following benefits:

- adds flavour to the product
- improves the crust colour by caramelisation of the lactose (milk sugar) and the Maillard reaction
- liquid milk will help to bind dry ingredients together
- the butterfat and lactose content of the milk improve the richness of the product, as compared to water
- improves the food value of the product.

Flavours and spices



Spices by [Taken](#) under [Pixabay licence](#)

Flavours and spices are aromatic vegetable products usually ground into a powder or flakes. They contribute to the flavour of products and help improve the quality.

When using spices, it is important to be aware of the following:

- lack of standardisation in the spice products
- using more than approximately 2% of spice will affect the fermentation process of the dough so you will need to adjust the formula for the dough
- avoid adding too much as this can provide a bitter aftertaste of the final product.

Common spices used in baking

Spice/flavour	Description
Cinnamon	Cinnamon is from the thin bark of the cinnamon tree and is brown in colour. Care needs to be taken in using cinnamon when mixing the dough as it can restrict yeast growth, so more yeast may have to be used. Cinnamon sprinkled on the dough does not seem to have the same effect.

Spice/flavour	Description
Nutmeg	Nutmeg is the kernel of the fruit or seed of an evergreen tree, which is a native of the Moluccas Islands. Nutmeg is dried and removed from the shell and ground. Ground nutmeg is used as topping for a range of sweet, savoury and spicy products.
Ginger	Ginger is made from the roots of a reed-like plant. Ginger is a fine spice and should be used carefully when blending with other spices.
Allspice	All spice is the berry of the pimento tree, native to Jamaica, Cuba and Central America. The berries are dried and ground. They have the flavour of a combination of spices mainly nutmeg, cloves and cinnamon. This spice is one of a few having its origin in the Western Hemisphere; almost all of the others come from the Eastern Hemisphere
Cloves	Cloves are the dried flower buds of an evergreen tree that is a native of the Moluccas Islands, or often called the Spice Islands. The best cloves are large and plump, somewhat wrinkled, unbroken and a light purplish brown colour.
Mixed spice	Mixed spice is a mixture of several spices, usually cinnamon, ginger, nutmeg. It is used where a balanced mix of spices is required. Not to be confused with allspice.
Anise	Anise, also called sweet cumin, comes from the delicate bush of the Hemlock family. The seeds give a sweet aniseed flavour and in some parts of Europe are used to flavour cakes and breads.
Star anise	Star anise comes from the fruit of the ever green tree that belongs to the Magnolia family. It contains the same essential oil that gives anise its characteristic flavour but is much stronger and more liquorice like.
Vanilla	Vanilla comes from a climbing orchid found in the tropical rainforests that are picked unripe and left to cure to a dark brown. It was used by the Aztecs to flavour chocolate and due to its exotic scent imparts a warm, flowery, rich and spicy aroma and flavour to the products it is used in.
Liquid spices and flavours	Chocolate extract, coconut extract, coffee flavouring, lemon extract, maple extract, orange extract and rose water.

Fillings and toppings for sweet yeast and artisan products

Fruit and nuts



Dried fruit and nuts by [garavitotfe](#) under [Pixabay licence](#)

From the traditional use of sultana, currant and mixed peel blend to using date, fig and a pistachio blend in modern bakery products, fruit and fillings are an important source of flavour and colour in bakery products. Fruits and fruit fillings come as frozen, pureed, dried and freeze dried, powdered, whole, sliced and fresh product.

Using fruit in dough

It is important to take care when using fruit in baking. If the fruit breaks up too much, acid and sugar will be released and have an inhibiting effect on the fermentation of the dough.

Here are some important points to remember when using fruit in dough:

- Acid will kill/slow down the yeast
- Excess sugar will weaken the dough structure
- The broken fruit will discolour the crumb

Conditioned fruit

Fruit should always be pre-conditioned before use. If you have just taken your fruit out of the cool room at 4°C and you place this into your dough, it will drop your finished dough temperature too much and cause delaying of fermentation and production scheduling.

Dried fruits

Dried fruits are available in various grades. The most commonly used dried fruits used in baking are:

- Sultanas
- Raisins
- mixed peel
- sliced apple
- prunes (plums
- pineapple
- currants
- apricots
- glace cherry
- dates
- figs
- cranberry.

Grades of fruit

Dried sultanas are graded in crowns and the lighter the colour the higher crown, with 5 being excellent. When preparing dried fruits for use in bakery products you need to follow these steps:

1. Remove the fruit from the packaging and separate the pieces, removing stalks, etc. when using cheaper ingredients to improve eating qualities.
2. Place in a sieve or similar and remove all seeds, stalks and dirt in cold water.
3. Store in a container with an air tight lid.
4. For extended storage refrigerate.
5. Wash fruits as required and avoid having excessive amounts which may ferment in warmer weather if not stored in the cool room.

The following are advantages of washing dried fruit before use:

- Increase in yield (plumps up the fruit)
- Extends the amount of fruit making production more cost effective
- Hydrated fruit will prevent taking moisture from the dough (slows fermentation) and from the baked crumb (staling)
- Create more volume in baked product – with the aid of steam releasing from the fruit through baking.

Glace fruit

Most glaze fruit (cherries, pineapple, apricots) may be cut into small pieces approximately the size of a raisin or sultana for more even dispersion of the fruit through the dough. Wash any excess syrup off the fruits before cutting and adding to dough. Syrup is failure high in sugar content and this will affect the dough fermentation, discolouration of the dough and take longer to mix into the dough.

Candied fruits

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

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

Tree fruit

Tree fruit, such as dates, apricots, apple, and peaches, can be cut into small pieces approximately the size of a raisin or sultana for more even dispersion of the fruit through the cake.

Like all ingredients, fruit and savoury ingredients need to be stored safely and under the correct temperature control and used within expiration dates. Food Safety Information can be found in the [Food Standards for Australia and New Zealand](#). Chapter 2 of the Standards lists the requirements for particular food items.

Fruit fillings

Fillings enhance the visual appeal and taste of products. When adding any ingredients to the dough, you will need to understand the role the ingredient will play in how the dough will ferment. It is important that all ingredients are adjusted to ensure a good final result.

Fruit fillings will generally require preparation and will need to be stored safely prior to commencing mixing. Label any storage containers with savoury fillings and date of preparation to ensure they are used within applicable food safety timeframes.

Fruit fillings can be used by adding to the dough mixture at the later stages of the mixing process or later in the moulding stage.

Fruits used for fillings include apples, raspberries, blueberries, apricots, lemons and cherries. Most fruit fillings that are used for sweet yeast and basic artisan products are stabilised with a cold set starch, sometimes referred to as instant clear gel or pre-gel. This means starch in this product has been pre-gelatinised which enables it to thicken when added to cold liquids. Mix the sugar through the starch to prevent white starch lumps forming during the mixing process.

Below are some important points to remember when using fruit fillings:

- The boiling point of fillings is determined by the percentage of sugar in the finished fruit mixture. Generally, the higher the sugar content, the higher the boiling point. Consequently, the sweeter the filling, the longer the time it can stay in the oven without boiling out.
- Boiling out may also be caused by too hot a filling. Colder fillings require longer time to heat and boil out. There is less chance of boiling out if the filling is at room temperature when placed in the product.
- A long baking period in a relatively slow oven allows the filling to be heated to the boiling point before the crust is properly baked. Oven temperatures that are too low may also cause the boiling out of a filling.
- Fruit fillings must be added at a suitable temperature to prevent any effect on fermentation of the dough.

Using fresh fruit

The following are steps for using fresh fruit in baking sweet yeast and basic artisan products:

1. Wash all fruit to remove any harmful chemicals that may be present on the surface.
2. Dry the fruit thoroughly and remove all excess moisture so it doesn't drain onto the custard and make it separate, or make the pastry or bread go soft or soggy.
3. Glaze with gel or boiled jam. The shiny finish is achieved by glazing with flan gel. The benefits of this are:
4. The glaze stops the fruit drying out or going mouldy, thereby extending shelf life of the product.
5. The glaze is usually sweetened or the jam can also contribute to the finished flavour.

Nuts

Nuts can be used to produce flavour and texture in sweet yeast and basic artisan products. Roasting can enhance the flavour and aroma. Some techniques for adding nuts include the following:

- A whole nut can be pressed into the top of each individual dough product. This can be used to indicate the type of product or used for decorative purposes. For example, you might want to press a whole almond into an almond flavoured roll or a hazelnut into a hazelnut roll.
- Chopped and flaked nuts can be sprinkled over products in the same way as sugar. Nuts brown during baking, so avoid using on products that are baked at a high temperature or baked for a long time as the nuts may overbake.

The following are common nuts used on bakery:

Type of nut	Description and use
Almonds	Flat, oval-shape almonds have a mild, rich flavour. They can be purchased whole, sliced, slivered, chopped and ground. You can remove their brown skins by blanching.
Cashews	Crescent-shape cashews go well with chocolate, and offer a rich, buttery flavour. When your recipe calls for cashews, choose roasted ones unless directed otherwise.
Hazelnuts	These small round nuts feature a mild, sweet flavour that is enhanced by toasting. Hazelnuts can be used roasted, toasted, chopped, ground or whole. When used for baking, their brown skins should be removed by roasting in the oven for 10 minutes, then rolling in a clean tea towel or a sieve to remove the skin.
Macadamia nuts	These rich, sweet, tropical nuts also pair well with chocolate. Macadamia nuts are most often used roasted and chopped in products.
Peanuts	The most popular nut (despite being a legume), the peanut is usually roasted and salted to bring out its buttery flavour. When your recipe calls for peanuts, use cocktail or dry-roasted peanuts. Spanish peanuts are usually reserved for candies. Peanut butter can also be used as an alternative.

Type of nut	Description and use
Pecans	Pecans have the highest fat content of any nut. They can be used toasted, roasted, salted, chopped, whole or broken into pieces.
Pistachio nuts	Pistachio nuts have a mild, sweet flavour and are available shelled or unshelled, raw or roasted, and salted or unsalted. Ensure you shell the nut before adding to the recipe.
Walnuts	Walnuts can be purchased year round, in both shelled and unshelled versions.

Chopping nuts

Nuts can be chopped using a food processor or hand chopping. When hand chopping, use a large chef's knife with a tapered blade and an appropriate chopping board. A safety tip is to input a damp cloth under the cutting board to prevent movement during the hand chopping process. With one hand on the handle and the other on the tip of the knife carefully rock the knife blade across the nuts until they are the right size. Go slowly so the pieces don't fly off the cutting board.

When reading recipes, there are some common terms used to describe the chopped nuts which are listed below.

Term used to describe	Description
Coarsely chopped nuts	Cut into irregular pieces approximately ½ cm or larger
Chopped nuts	Cut into irregular pieces approximately ½ cm big
Finely chopped nuts	Cut into irregular pieces approximately 3 mm big
Ground nuts	Usually prepared in a blender or food processor, to resemble coarse flour

Storing nuts

Store nuts in their shells in a sealed airtight container or bags until you are ready to bake with them. This will assist in maintaining their fresh quality. Nuts are high in fat content so they spoil easily and can go rancid. The higher the fat content, the faster they will spoil. It is important to note:

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

Chocolate



Chocolate shavings by [safran7](#) under [Pixabay license](#)

There are two main types of chocolate used in baking:

Type of chocolate	Advantages/Disadvantages
Couverture	<p>Made from roasted cocoa beans and finely milled sugar. Contains cocoa butter, the natural fat of the cocoa bean.</p> <p>Advantages:</p> <ul style="list-style-type: none"> • superior flavour • better eating qualities due to the fats with a low melting point and smoothness in the mouth <p>Disadvantages:</p> <ul style="list-style-type: none"> • additional skills and time required to temper the chocolate • requires controlled room temperatures and refrigerated cooling for setting the chocolate
Compound	<p>Made from the roasted cocoa bean and finely milled sugar, the cocoa butter is substituted with various vegetable fats and emulsifiers, making it very different to couverture chocolate</p> <p>The fat used has a high melting point and does not require the same melting, cooling and reheating as the couverture chocolate.</p> <p>Advantages:</p> <ul style="list-style-type: none"> • more easily prepared/melted for use • quickly melted/prepared • can withstand high bakehouse temperatures • may be set in a cool position without the use of refrigeration <p>Disadvantages:</p> <ul style="list-style-type: none"> • lacks the flavour of couverture chocolate • has inferior eating qualities due to the high melting point of the fats • cracks when cut as a coating on top of a product

Effects of water on chocolate

A minute amount of water will cause the chocolate to thicken slightly (suitable for piping), additional water will cause it to thicken whereby it will not flow as a coating. The continued addition of oil will bring the chocolate back to a pouring consistency, but if used as a coating will develop a white sugar bloom on the surface. This is not recommended for couverture chocolate.

Chocolate variations

Variations	Ingredients
Dark chocolate	Made from roasted cocoa beans and sugar. Roasting the beans and level of sugar added produces the darkness and flavour.
Milk chocolate	Made from roasted cocoa beans and sugar with milk powder added to produce a milk flavour.
White chocolate	Made from cocoa butter (the natural fat from the cocoa bean), sugar and milk powder. Does not contain chocolate liquor which gives other chocolate the different degrees of bitterness and darkness.
Cocoa powder	The quality of cocoa powder can vary and is dependent on the level of cocoa butter that it contains. Higher levels of cocoa butter give a richer flavour.
Dutch cocoa	Dutch cocoa is treated with an alkaline for a richer, less bitter flavour and darker colour. This type of cocoa has the ability to emulsify better with liquids (this means it is more soluble). (NOTE: Dutch cocoa can be unsuitable for bread products as the alkalinity will affect the fermentation process – test carefully before using)

Glazes

Glazing is a type of finishing medium and is different from icings and toppings as they enhance the baked surface of the product without necessarily creating or adding to the existing flavour. In most cases, the purpose of the glaze is to add colour, shine and a seal to baked surfaces. Glazes for sweet yeasted goods fall into two categories:

1. pre-baked glaze
2. post-bake glaze.

Pre-bake glaze

Pre-bake glazes are wet glazes applied before the product is baked and include:

- Milk
- Milk and egg
- Egg yolk
- Whole egg (egg white on its own is unsuitable as a glaze due to the whitening effect as it coagulates in heat)
- Powder form proprietary glazes are available to replace egg wash. The powder is usually added to boiling water. This form of glaze has better handling and potentially safer food practices for bakeries.
- Cornflour glaze



Practice activity

Activity 2.5: Glazing

You teacher will co-ordinate this activity in class. Each student will be assigned a type of glaze for a fruit loaf. Before commencing, record the expected crust results for each glaze type. Then record the actual result for the product you glazed. When everyone shares their results, write down the crust results for other glazes.

Ingredients	Expected crust results	Crust results
Egg		
Egg white		
Egg yolk		
Egg yolk, pinch of salt		
Egg, milk		
Egg, milk, pinch of salt		
Milk		
Cream		
Olive oil		
Corn flour glaze		
Sugar glaze		

Post-bake glaze

There are a variety of post-bake glazes which are applied after the product has been baked.

Bun wash

A bun wash is a saturated sugar solution made from sugar and water. Spice may be added for extra aroma and flavour. When a bun wash is applied to a hot product the heat from the product drives off the moisture from the wash leaving behind the recrystallised sugar crystals (forming a smooth shiny surface). If the bun is not washed immediately after baking the wash would not set and would remain sticky.

Jam

Jam is often used for rich yeast products, such as Danish pastry. Boiling jam so that it is smooth and hot before using will ensure it re-sets with a firm, dry skin on the surface.

Pre-condition your jams before use by mixing well and removing all lumps before spreading or piping.

There are specialised baking jams for example Rasplum Jam. This is specifically made for the baking industry. It is a seedless raspberry flavoured jam filling that is used in many bakery goods in Australia. It can be used for doughnut and cream buns.

Butter/margarine

Butter or margarine can be used as a glaze on the crust of bread by brushing as soon as the product leaves the oven.

Creams and icings

Butter cream and icing are used for filling, icing, and decorating sweet yeast and basic artisan products.

Creams include:

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

Fresh cream

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

To make a crème Chantilly or sweetened vanilla cream, use a thickened cream adding 10% sugar and vanilla essence to taste.

Advantages and disadvantages of fresh cream

Using fresh cream has the following advantages and disadvantages.

Advantages of dairy cream:	Disadvantages of dairy cream:
Natural butterfat flavour.	Will only double its volume when whipped.
Low melting point and melts quickly in the mouth.	Highly perishable and must be kept refrigerated.
Natural product.	When whipped, it doesn't hold its shape for long periods. 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, adding 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

Advantages of imitation cream	Disadvantages of imitation cream
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/butter cream

Usually referred to as 'butter cream', mock cream is a combination of sugars and fat in varying proportions to create a rich cream. Mock cream is used as a cost saver instead of fresh cream. This is processed in the bakery and is made from icing sugar, sugar syrup and vanilla essence. It usually has a fat added (usually a cream shortening) to imitate fresh cream.

The fat can include butter, margarine, creaming, shortening, either singly or in combination. Butter creams should be light and smooth and should always be made from a high quality sweet butter. Butter creams made from margarine or shortening can be unpleasant to eat because of their higher melting point; however, a small amount of margarine or shortening added to the butter cream stabilises it without detracting from the taste.

The richness of the mock or butter cream may be enhanced by the increase in fat content, type of fat (butter), addition of egg or custard. Heavy butter creams usually contain added bulky ingredients such as custard. Lighter creams are usually restricted to fewer ingredients, some contain added egg white (meringue) and are well aerated.

Types of butter creams include:

- French
- German
- Italian
- German

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

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

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.

Icings

Icings and glazes are applied to baked products to enhance their visual appeal and to add to their flavour. In baking, the term 'decoration' describes the addition of anything added to the product that makes it more visually appealing and pleasing to the palate. Decorating is a skill and careful attention to the quality of the decoration is important.

Bakery products can be iced with a variety of finishes. The table below lists a range of icing types and how they are used.

Icing type	Explanation
Water icing	<p>Used for quick sale items, where a quality finish is not required, such as cupcakes and slices. Water icing is a mixture of soft icing sugar or icing mixture, hot water, and sometimes a small amount of fat. Glycerine may be added for shine.</p> <p>This icing can be easily made by mixing sufficient boiling water with icing sugar until spreading consistency is obtained. It can be made to a better standard of quality by mixing stock syrup with icing sugar and heating to a useable consistency. Water icings can be coloured and flavoured.</p>
Butter icing	Used mainly for icing yeast goods, this is made with icing mixture and shortening, beaten to a soft creamy consistency with water or milk. Flavourings and colourings may be added.
Fondant	Fondant is a mixture of water, sugar and glucose and may be spread, piped, and poured, and accept colourings and flavourings. Fondant provides a quality finish with good keeping properties and has a shiny, soft surface.

Fondant

Fondant is a mixture of water, sugar and glucose that has been boiled to 114°C and creamed whilst cooling, so that the sugar forms tiny crystals. It is commonly used as icing for cakes and pastries.

The following are steps when using fondant:

- Fondant should ideally be tempered to 37°C. (Check manufacturer's recommendations on ideal temperature.)
- Temper by placing over a water bath or in small bursts in a microwave and monitor carefully until the required temperature/consistency is reached.
- Fondant can be thinned by the addition of stock syrup or refrigerated egg white, avoid water as it affects setting the fondant.

Overheating fondant will result in a dry or dull finish, lose its shine, or crack and flake off the baked product.

When using fondant in the bakery, the fondant can become hard and brittle as you get to the bottom of your bowl or bucket. To prevent this, place a coating of sugar syrup on the new bucket as this will prevent having to scrap fondant down or having to waste fondant that has become hard at the bottom of the bucket.

When colouring fondant in production always start with the lighter colours first and work your way through decorating colours, finishing with the chocolate fondant. This will prevent using a lot of bowls and washing up for yourself.

Custards

Custard preparation methods

Hot set – thicken with cornflour (wheaten cornflour or maize cornflour (gluten free cornflour), wheat flour (bakers), custard powder, egg yolks, modified starches, semolina or instant preparations with pre-gelatinised starches.

- When cooking on a hot plate with gas remember to ensure the flame is medium strength (flame inside the pot) and the pot is sitting evenly over flame.
- If using milk at stage one - bring to boil - ensure not to walk away from stove as it will boil over.
- When thickening in the stove top ensure that it comes back to the boil to cook out the starches.
- Stir constantly to prevent any chance of sticking to bottom of pot and burning.
 - This will impart a burnt flavour or dark specks through your custard.
 - The recipe you will use in this module is thickened with a modified pie thickener. The benefit of using this thickener is that it can be used in products that need to be baked. The pie thickener will prevent separation or splitting of the custard.

Cold set instant – premix powder made with flavours and a pre-gelatinised starch that is added to cold water and whisked to desired consistency. Minimal preparation required.

- Too tight – when going into a product to be baked it will continue to thicken and dry during the baking process. Therefore, providing a separation of dough and custard in scrolls for example. It will also have an unpleasant mouth feel from being too tight/dry.
- Too wet will cause production issues, such as hard to mould final dough, or during baking can boil and run out of the product. Similar issues that are in the faults of fruit fillings.

Crème Chiboust – Lightened with meringue and further stabilised with gelatine used for finishing and cannot be re-cooked.

Crème Patissiere (crème pat) – Mixed or refined (enriched) with whipped cream folded through the custard and cannot be re-cooked.

All custards can be based on milk, water, juice, cider or wine.

Important that all custards are stored correctly in cool room below 4°C.



Self-check questions

Activity 2.6: Check your knowledge

1. Explain why an increased yeast percentage is necessary in a sweet dough.

2. Name three glazes that can be used to finish a sweet yeast product.

3. Why is it preferable to wash dried fruits for addition to a sweet yeast dough?

4. List the ingredients which are enriching agents and their functions.

5. Why is it important to select good quality ingredients?

Topic 3

Production processes



Topic 3: Production processes

In this topic, you will learn about the production processes for sweet yeast and basic artisan products.

You will learn about:

- Mixing dough for sweet yeast and basic artisan products
- Processing sweet yeast and basic artisan dough
- Pre-bake finish sweet yeast and basic artisan dough
- Bake sweet yeast and basic artisan products
- Presenting, storing and packaging sweet yeast and basic artisan products
- To learn about this topic:
- Read the information
- Do any practice activities as instructed by your teacher
- Do the self-check questions
- Talk to your teacher if you need some assistance with this
- Take a look at the additional resources

Baking sweet yeast and artisan products involves key production steps. As with all products relying on the development of dough, times and temperatures must be carefully monitored so that you can rectify any faults that occur.

Types of dough

The following types of dough are mixed to create basic artisan products:

- Instant dough/scratch mix/no time
- All in mix
- Ferment, including bulk and 'sponge and dough'

Instant dough, scratch mix, no time dough

Since the mid 1960's, the bread making process has developed from the bulk fermentation process to much shorter processing times. This was possible by adding a higher level of gluten strengtheners (such as ascorbic acid) to the dough, which matured the dough more quickly. This process is known as the rapid dough process or instant/no-time doughs. Rapid instant doughs involve mixing all the ingredients together and resting the dough for about 10-30 minutes before processing.

Ferment – bulk and 'sponge and dough' process

The bulk fermented method of production can be broken into two sections:

Bulk ferment

In working with basic breads and savoury breads, the rapid or instant method of dough making has been used. This method requires full gluten development at the mixing stage with a 10-15 min rest before scaling and a further 10-15 minutes rest prior to final moulding.

The straight dough method is where all ingredients are mixed together and the dough set aside for a pre-determined time, with a minimum 1-14 hours maximum (recommended) before being scaled into loaf size pieces. After the usual intermediate proof, dough pieces can be moulded into specified shapes.

Sponge and dough

The sponge and dough method is where a sponge or primary ferment is mixed and set aside for a pre-determined time using 50% of the total flour weight. The flour is mixed with water and the ingredients which promote fermentation such as yeast, sugar and time dough improver.

The sponge needs to be mixed using up to 70-80% of the total water for the whole dough. It will be of soft consistency. The yeast is calculated for bulk fermented dough.

The dough ingredients (remix) consist of the remaining flour, remaining water (dough temp control) and items that retard or control fermentation such as fat/oil, salt and skim milk powder.

Remixing takes place when the sponge has reached about 80% of ripening. To determine whether the sponge is ready check that bubbles have appeared and are not breaking. If the bubbles start to appear and you are not ready to remix place sponge in fridge to prevent over ripening. Over ripening happens when the sponge bubbles 'break', 'drop back' or sinks in the bowl. If this occurs the sponge will not preform to its best capacity. The remixing can then take place and the dough is treated in the usual way, that is, 10 minutes rest after mixing and 10 minutes rest after scaling before final moulding.

The process for bulk and the sponge and dough methods are determined by the dough to oven principle (D.T.O), that is, the hours that elapse from the time the dough is mixed until it goes to the oven.

The alterations to the dough recipe using this method are:

- A reduction the quantity of yeast used
- A change in a reduction of an instant bread improver (1%) to about 0.2 - 0.25% or you can purchase a bulk fermented type bread improver and use at manufactures recommended percentage %.
- Note: bread improvers are not as important as we are relying on the fermentation principles to strengthen our doughs.
- For long ferments, bread improvers are not recommended.
- An increase water addition, as the starch particles have more time to absorb moisture and the natural fermentation process will strengthen the gluten.
- A reduction in the finished dough temperature to 23-25°C, depending on time — cooler dough for longer ferment. You do not want to over ripen with warmer dough and long fermentation.
- Mixing time can also be slightly reduced and allow fermentation to continue to ripen the gluten.
- Longer final proof time.

Calculating yeast

A fixed factor of 6 is used and this is divided by the dough to oven hours to give a figure which is the yeast percent, see below example of calculating yeast quantity for both methods of production.

Fixed factor: $6 = 2\%$

DTO 3

The fixed factor increases when the level of protein increases in a dough, for example high protein uses a factor of 8. The fixed factor is a figure arrived at by bakers after many years of making 'time' doughs where excellent quality bread was produced.

See below for a guide on dough to oven:

DTO	Finished mixing	Recovery period	Scale dough 5min	Intermediate proof 10min	Mould and tin 10-15min	Final proof 60min	Oven
3 hour	9:00	1hr 30mins	10:30	10:35	10:45	11:00	12:00

Knock back every 30 minutes - replenish oxygen.

Salted/dead display dough

This type of dough is a modelling dough that can be made from flour, salt and water. It can be used to make ornamental items and sculptures. The dough can be dried in the oven or microwave and sealed with a varnish or polyurethane. It then can be painted or decorated with food colouring mixtures or paint. Festive decorations can be made using this type of dough.

Sweet yeast and artisan production process

The following diagram outlines the key steps in the production process.

STEPS IN THE PRODUCTION PROCESS

1 Calculate recipe/prepare ingredients and fillings



2 Mixing the dough



3 Recovery



4 Divide/scale/mould and intermediate prove



5 Final mould, retard and laminate



6 Final prove and pre-bake finishing



7 Fry/bake



8 Post-bake finishing and decorating



9 Package/present/store

Step 1: Calculate recipe and prepare ingredients and fillings.

Your first step in producing your sweet yeast or basic artisan product is to calculate your recipe requirements. You can then prepare and weigh ingredients as per the production requirements. The following is an example of a production schedule.

Production requirements (note all kg's are scale weights):

Dough no.	Type of dough	Shape required	Amts	Kg	Totals	
1	Milk dough	Small lunch loaves	4	0.450		
2	Fruit loaves	4 piece square	3	0.800		
3	Brioche	Viennas	3	0.510		

Formula:

	Dough no. 1		Dough no. 2		Dough no. 3		Dough no. 4	
Ingredients	%	Weight	%	Weight	%	Weight	%	Weight
Flour – bakers	100		100		100			
Water + or -	58		50		20			
Yeast	4		10		6			
Salt	2		1		1			
Sugar	2		10		1			
Bread Improver	1		1		1			
Fat or oil	2		10		20			
Milk powder	4							
Sultanas			25					
Eggs					30			
Totals								
RDT	27°C		27°C		27°C			

Formulas

A formula is a recipe and lists the ingredients by percentages.

There is an important formula to remember for all bread recipes:

$$\text{Total dough weight} \div \text{total \%} = \text{Flour weight}$$

Calculate flour weight for bread dough

To calculate the flour weight when you are making dough, you will need the total dough weight figure and the total percentage in the recipe. All Ingredients are calculated on the flour weight. All percentages can change; however, the formula stays the same.

Dough no.	Type of dough	Shape required	Amounts	Kg	Totals	Whole dough total
2	Fruit loaves	4 piece square	3	0.800		2.400

The following is an extract from a formula showing total percentage in the recipe:

- Dough: No. 2
- Total dough weight: 2.400

Ingredients	Percentage %	Weight
Flour – bakers	100	
Water + or -	50	
Yeast	10	
Salt	1	
Sugar	10	
Bread Improver	1	
Fat or oil	10	
Milk powder		
Sultanas	25	
Eggs		
Total %	207%	

See below for an example of a bread formulation. Your teacher will work through this example with you. The calculations for dough 2 are:

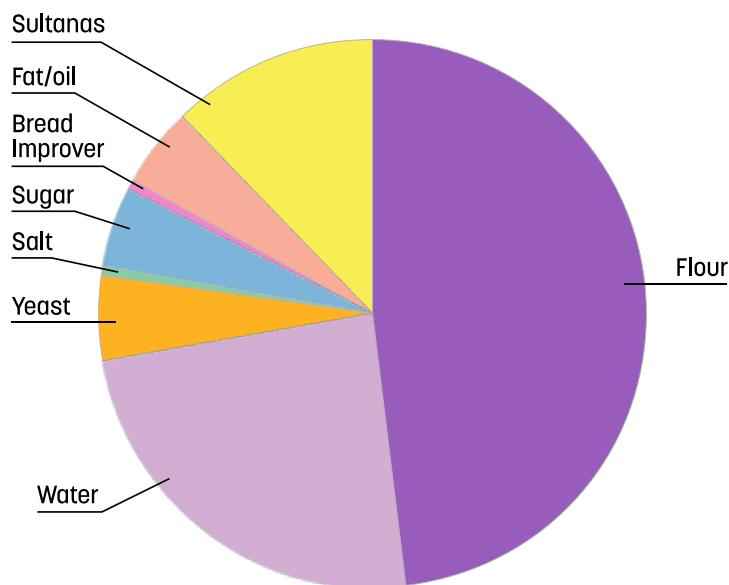
- Always round flour up to nearest 0.100kg = 1.200kg of flour is needed for the recipe.
- Flour becomes the 100% of all recipe calculations.
- $1.200 \times 50\%$ (for the correct result press the % button on your calculator and *not the = button*) = water amount.

Let's work through an example:

Ingredients	Percentage %	Calculation	Weight
Flour – bakers	100	-	1.400
Water + or -	56	$1.400 \times 56\%$	0.784
Yeast	3	$1.400 \times 3\%$	
Salt	2	$1.400 \times 2\%$	
Sugar	2	$1.400 \times 2\%$	
Bread Improver	1	$1.400 \times 1\%$	
Fat or oil	2	$1.400 \times 2\%$	
Total %	166%		

Important: As you weigh up each ingredient, tick it off on the formula sheet or make sure each ingredient is on top of the flour to check off. Don't rely on your memory, as mistakes can be costly! Remember don't allow ingredients to come into contact with one another.

SWEET YEAST INGREDIENT PERCENTAGES



Ingredients	%
Flour – bakers	100
Water + or -	50
Yeast	10
Salt	1
Sugar	10
Bread improver	1
Fat or oil	10
Sultanas	25
Total %	=207%

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NOTE: Keep water in jug until start of mix. Record start of 2nd speed time. Keep fruit separated to fold through after development

Workflows

During practical activities, you will be asked to use a production record and workflow document to record your production. The following documents are examples of what will be used. Your teacher will explain the use of production records and workflows in more detail.

(1) Example of a production record:

Dough record	Dough no. 1	Dough no.2	Dough no. 3	Dough no. 4
Dough type	Milk dough			
Fault (if any)	Mixing			
Required FDT	27			
Major factor	55			

Dough record	Dough no. 1	Dough no.2	Dough no. 3	Dough no. 4
Bakehouse allowance	-			
Room temp	20			
Flour temp	20			
Required water temp	15			
Start mixing	8:00 (start of 2nd speed)			
FDT	26			
Finish mixing (recovery)	8:10			
Scale - intermediate proof	8.25			
Final mould	8:40			
Time to prover	8:50			
Time to oven	9:35 -9:50			

(2) Example of a detailed production record:

A workflow can be as detailed as you would like, below is a more detailed example.

Time	Task	Notes	Setting
7:30am	Set up	Wash hands Check recipes Gather ingredients	
7:45am	Weigh up	Weigh dough no. 1 Check off ingredients	
7:55am	Start dough	Start the hydration process	
8:00am	Start development	Check FDT and window	
13:00pm	Clean up	Follow bakery cleaning schedule	
13:30pm	Finish		

Prepare fillings

Preparing fillings is something you may do the day before, especially if you are using a filling that requires cooking, soaking or some other form of preparation. Filling ingredients may be added at the point of mixing with other ingredients, at the pre-bake stage or after baking.

Common ingredients used for fillings for sweet yeast and artisan products are listed in Topic 2. When preparing dough ingredients, you will need to consider the impact of the added filling ingredient and what effect it may have on the fermentation process. For example, the addition of salted ingredients, may mean more water is required in the formula.

Step 2: Mixing dough

Mixing the dough is one of the most important steps in producing sweet yeast and basic artisan products, as this process has a great influence on the final baked product.

The first function of dough mixing is to thoroughly and evenly distribute the ingredients throughout the dough mass.

This is usually referred to as the dispersion stage and it is at this time that the 'equalisation' of the various ingredient temperatures takes place, resulting in a common dough temperature.

The dough which is formed at this stage is lumpy, rough and sticky. As the gluten forming proteins which are mixed with the starch in the flour are not evenly hydrated, they do not have the ability to form a gas-retaining network.

The second and most important function of dough mixing is to 'develop' the gluten and to thoroughly and evenly distribute this throughout the dough.

One of the main objectives of dough mixing is modifying (developing/conditioning) the gluten. During the dough mixing process we aim to string out the strands and recombine them into a network capable of stretching and retaining the gas produced by the yeast. We are looking for a clear window in the dough, where it does not tear when stretched, light passes through and you can see the gluten strands in the stretched dough.

In order to make the gluten stretchy, the gluten must be continually worked until it is developed. The mixing must continue until the dough is 'cleared' and has become smooth. Gluten softeners may be used to help mix and develop the dough. These are also known as reducing or clearing agents.

Mixing guides for sweet yeast and basic artisan products

There are a variety of mixing processes depending on the product being made. It is not uncommon for sweet doughs to have delayed sugar and fat incorporation.

- **Delayed sugar:** (above 8% sugar content) method is done because sugar will compete for moisture the same as the starch and gluten does. It is important that the gluten and starch are hydrated before the mixing process. Not only does the sugar like the moisture it will also have a softening/tenderising effect that on the gluten.
- **Delayed fat:** (above 10%) This method is mostly common in the enriched doughs such as brioche. If the butter was added at the beginning of the mixing process it would prevent the gluten bonds from forming and produce a batter rather than a dough. It is important to start the mixing, form the gluten, then incorporate the butter in small amounts during the mixing process. It is important not to have a FDT above 25°C as this will affect the rest of the processing of these types of dough.
- **Modelling dough:** Modelling dough requires less mixing so the dough is not too tough and easier to mould. Rye flour and high sugar saturated doughs require less mixing so usually more suitable for modelling dough.
- **Croissant/Danish:** requires less mixing than bread doughs; however, for best results ensure a very low FDT with some gluten development. A general guide is that if your flour for instant doughs takes approximately 10-12 minutes, you will need to halve that time for croissant or Danish dough. The rest of the development will come from leaving this dough in the cool room for 10-14 hours. The cold dough will ensure ease of use for lamination allowing good build-up of acidity. This will strengthen in fermentation and create a crispier final product.

Dough temperature

Dough temperature is of vital importance to the baker. Temperature affects the following:

- control of fermentation
- process of manufacture
- quality of the final product.

The temperature of the dough affects yeast activity, enzyme activity, gas production and gluten conditioning. The aim is that your dough is finished at the temperature at which yeast and enzyme activity is controlled but steady.

Gluten is also temperature sensitive, as temperature variations influence physical properties of the gluten protein. Warm temperatures above 30°C result in loss of gluten elasticity and strength. Temperatures below 24°C cause gluten protein to be tough and rubbery.

Yeast is sensitive to all the environmental factors, especially temperature. At some temperature ranges yeast activity is retarded and at others it is stimulated. If yeast is heated beyond 60°C it will die. Yeast is most active at 32-35°C, and produces gas at a controlled rate at 25-30°C.

Enzymes in the dough and in the yeast are also temperature sensitive. They work rapidly at warmer temperatures and are retarded at low temperatures.

Variations of 1°C can retard dough proof times and production times by up to 30 minutes. This means that a dough might occupy the prover for an extra 30 minutes, resulting in empty ovens and a shortage of tins and proving space, increased relative costs as well as poor product quality.

There are various factors that affect the finished temperature of the dough. These are:

- room temperature
- flour or mix temperature
- mixer friction factor
- water.

Room temperature

Unless you are able to maintain a constant temperature in your ingredient storage area, you must make adjustments in your doughs to achieve the optimum temperature after mixing. You probably already make adjustments as you proceed through your production schedule, but if the first dough of the day is too cold, it won't ferment and proof on time, and this can delay the processing of the rest of your doughs.

To be absolutely certain of turning out a consistently high-quality product, you should measure dough temperatures. Starting with the correct temperature eliminates further adjustments later during makeup.

Mixer friction factor

Including a mixer friction factor is necessary because, depending on the mixer, batch size, mixing time and dough consistency, the mechanical action of mixing can add several degrees to the finished dough temperature.

For example, a double-arm mixer simulates hand-mixing most closely and may add only a degree or two to the final product due to the friction of mixing; however, mixing dough in a horizontal mixer produces a great amount of friction, which heats the dough. This is why most horizontal mixers are jacketed allowing cold water to circulate through the jacket to remove excess heat and keep dough temperatures in the correct range. The vertical mixers found in most retail bakeries have varying degrees of friction, depending on the mixer size and speed, as well as the bowl size.

The smaller a batch of dough, the smaller the rise in temperature. The longer the mixing time, the greater part friction factor plays in increasing the temperature. The stiffer the dough, the more friction the mixing process generates resulting in a higher the friction factor.

The variation in quality caused by different water temperatures means it is vital that the baker controls the temperature of all the dough's they make. This is especially true in an intense production situation where a variation of 0.5 or 1°C can result in major production problems.

How to find the friction factor

You can determine friction factors using an accurate thermometer, a pencil and paper.

Calculating the mixer friction factor:

1. Check the accuracy of your thermometer. Place it in a pan containing both ice and water, so you have a mixture that is right at 32°F/0°C.
2. Prepare your dough as usual and note the temperatures of the factors above (three or four for dough). Then make your dough and note the finished dough or batter temperature.
3. To arrive at the friction factor, multiply the finished dough temperature by three (or four, for doughs that use a preferment).
4. Subtract the sum of the temperature of the other factors.

The dough formula looks like this:

- Dough friction factor = (finished dough temp x 3) minus (room temp + flour temp + water temp)

For example, if your room temperature was 25°C, flour temperature was 20°C and water temperature was 15°C, and the finished dough temperature was 28°C, your formula calculations would be:

$$(28^{\circ}\text{C} \times 3) - (25^{\circ}\text{C} + 20^{\circ}\text{C} + 15^{\circ}\text{C}) = \text{Dough friction factor}$$

$$84^{\circ}\text{C} - 60^{\circ}\text{C} = 24^{\circ}\text{C}$$

You now know that this mixer generates a friction factor of 24 for that dough batch size, and for that particular amount of time. It is important to account for temperature rise due to friction, otherwise the dough temperature will be too high when it is ready to come out of the mixer.

Once you have found the friction factors for your various mixers and the products you mix in them, you can just note them on your formula cards. This way you will have the friction factors for various products and batch sizes so you can reach the optimum temperature range for your doughs.

Higher or lower FDT

The baker has to be able to vary the FDT for many reasons, such as production capacity or to achieve varying product characteristics. The baker may finish the dough at 29°C or 25°C, not by chance but by design.

Experience has shown that the best bread products are produced from doughs that have a finished dough temperature of between 25-30°C. The following information explains the major factor method calculations which are necessary to make sure that the dough finishes mixing at the required dough temperature.

Major factor method

In order to find the required water temperature using this method, subtract the flour temperature and dough room temperature from the major factor figure (MFF). The MFF is an addition of the water temperature, flour temperature and dough room temperature combined. This figure is reached by making various doughs and recording all factors. The dough with the FDT nearest to 27°C should be the one used to record the MFF.

For instance, if the flour temperature is 20 degrees, the dough room temperature is 22 degrees and the water temperature is 16 degrees, then the MFF is 58; however, not all bakeries are the same so the MFF will be different. It is necessary for each bakery to establish their MFF. The benefit of this method is that it takes into account all relevant factors when making dough.

All of the doughs so far have had an RDT of 27°C. To achieve controlled variations, there are different systems that are used? For variations of the RDT we use a “bakehouse allowance”, which allows the baker to accurately alter the MFF to achieve a FDT higher or lower than 27°C. The operating rule is: for every degree above or below 27 degrees, you either add or subtract 1.5 degrees from the MFF.

For example, you require a FDT of 25 degrees. This is 2 degrees lower so $2 \times 1.5 = 3$. This figure must be subtracted from the MFF of 58, so in order to achieve the FDT of 25 degrees your new MFF is 55.

As water is the most convenient ingredient to alter temperature, determining the required water temperature (RWT) helps us to influence the finished dough temperature (FDT).

Example: Water calculations for a 27°C FDT

Major factor (MF) – room temp. (RT) – flour temp. (FT) = Required water temp (RWT)

MF 55 – RT 20°C – FT 25°C = RWT10°C

Abbreviations for dough temperature calculations:

Abbreviation	Full name for dough temperature calculations
MF	Major factor
RT	Room temperature
FT	Flour temperature
RDT	Required dough temperature
FDT	Finished dough temperature
TF	Time Finished (mixing)
MT	Mixing time
RWT	Required water temperature
BA	Bakehouse allowance

Steps in mixing dough

See below for pictures representing steps in mixing dough.

1. Check ingredients, start hydration and form dough working on 1st speed – check safety.



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- Left to right on 1st speed. It is important that dough is formed before 2nd speed mixing.



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- Mix dough to development - check window and temperature of dough. Round dough piece and cover to prevent any exposure to the air. Place into the recovery stage of fermentation.



(Left to right) Photo 1-4 © TAFE NSW. Photo 5: Over developed dough. Copied Under s113P, Slow Food & Handforged Tools (Online), Advanced Bread Making Course, <http://www.gandad.com/bread-making-3.html> (accessed 25/02/2019)

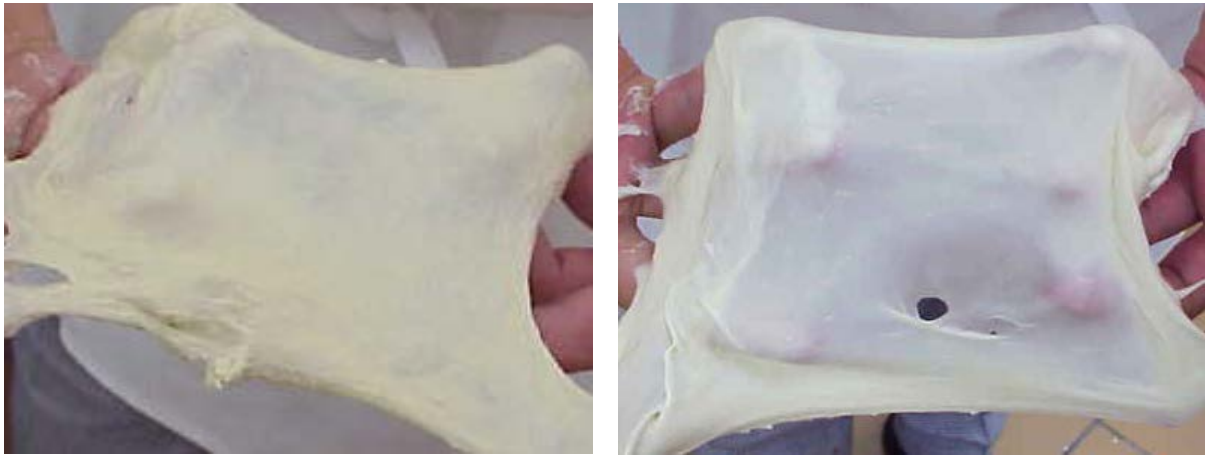
An important point for sweet yeast and basic artisan products: any inclusion of fillings after dough development must be added at a suitable temperature to prevent any effect on fermentation of the dough.

Faults in mixing doughs

An under-mixed dough tends to be sticky, uneven in feel, and will not be able to stretch adequately.

Over mixing softens the dough because the gluten has begun to break down, and water is exuded and forced back into the starch, producing stickiness.

Examples of under and over developed dough:



(Left to right) Under developed dough and over developed dough. Copied Under s113P, Slow Food & Handforged Tools (Online), Advanced Bread Making Course, <http://www.gandad.com/bread-making-3.html> (accessed 25/02/2019)

Mixing time depends on the:

- quantity and quality of the protein in the flour
- intensity of the dough mixer — the amount of ‘energy’ used
- tightness or slackness of the dough
- size of the dough in relation to the mixing bowl
- temperature.

For sweet yeast and basic artisan the ingredients and percentages used will change mixing times.

When the dough is finished mixing, check for a clear window. If you want to add fruit to the dough some bakers will not fully develop the dough as the 2-3 mins on first speed to incorporate the fruit is where the final development occurs. Once fruit is incorporated round up on the table.

Record the dough data:

- Finished dough temperature (FDT) will vary for the type of products produced. Basic sweet doughs recommended to be around 28°C and for enriched doughs it is recommended not to be above 25°C.
- Time finished (TF).
- Cover as soon as possible to prevent dough skinning.

Step 3: Dough recovery

After mixing and the dough is still in its bulk form, it needs to be rested for approximately 15 minutes; however, this time may vary depending on the temperature of FDT, ingredients added and product type. This is known as the recovery period and this time allows for the gluten to relax and start the fermentation process.

For some sweet doughs, the recovery period may require a period of time in the cool room for an hour or two, or in the case of brioche or croissant/ Danish dough, it may be for up to 12-14 hours before processing or laminating. This is good practice for these types of products to provide best production processing and flavour profiles.

A temperature of no more than 30°C is recommended during this first dough recovery period. Warmer dough will rise faster than colder dough so it is important to consider the environment your dough is resting in.

During this step, make sure all dough is covered with either plastic, a cloth or in a dough box to prevent skinning. While your dough is recovering you can weigh your next dough and prepare tins or trays for the products that are required to be produced that day.

Step 4: Divide, scale and intermediate prove

The purpose of dough dividing and scaling is to separate the dough accurately into pieces of specified weight and yield/amounts as required by the production schedule. It is essential that this task is undertaken in as short a time as possible to prevent over fermentation and damage to the dough structure. Dusting should be minimised to avoid faults in the final product.

This process can be done manually or mechanically and the aim is to produce a consistent dough size, dough shape and dough weight. A dough brake/dough sheeter may be used during this process to ensure a consistent dough thickness.

Ensure the following when performing the dividing step manually:

- Scales should be conveniently placed
- Pieces should be cut to meet the required size
- Maintain accuracy in scale balance
- Protect both dough and scaled and rounded dough-pieces
- Avoid excess dusting flour
- Round as soon as possible
- Protect as much fruit in the dough as possible to prevent loss and wastage.

Dough pieces need to weigh more than the finished product due to the following losses:

- Fermentation caused by yeast metabolism
- Baking causes evaporation of water and ethanol
- Evaporation of water due to cooling

Rounding

After the dividing stage, the dough piece has an irregular shape and is sticky with cut surfaces. Gas can easily escape and the gluten structure is not uniform and is not suitable for moulding. Depending on the product type required, rounding of the dough is usually done at this time to make final shaping easier.

Rounding has the following functions:

- Closes the cut surfaces to give the dough piece a smooth and dry exterior, and to make a continuous skin around the dough piece preventing the carbon dioxide gasses from escaping.
- Reforms the gluten structure, giving an even 3D matrix and allowing for even fermentation of dough.
- Provides a uniform shape for easier final moulding.

Sometimes the dough is finely dusted in flour to prevent dough being left on the surfaces of the dough rounder equipment.

Food safety

During the dividing and rounding steps, food safety is very important. It is a time where you are handling the dough and it is important to ensure surfaces are clean, sanitised and there is enough room for you to perform the tasks effectively and efficiently. If dough is left too long between the dividing and rounding stages, it can become too gassy and warmer than the temperature intended.

Intermediate prove

After dividing and scaling there is a rest period for the dough. This is known as the intermediate prove/proof stage. This can be done by resting each dough piece on sanitised bakery benches, in drawers or on racks. The dough must be covered to prevent skinning. The temperature of the environment and the dough will influence the time taken before final mould. The intermediate prove will cause the dough pieces to become more relaxed and flexible so they can be moulded satisfactorily. The dough piece will become larger and skin will become firmer. The dough stretches easily and it is ready to mould. This usually takes about 15 minutes.

Step 5: Final mould, retard, laminate

Moulding techniques

The moulding process involves shaping the dough into a shape that enables it to bake to product requirements. Moulding can be undertaken by hand or machine. Your teacher will demonstrate different techniques for the products produced during this module. It is important to note:

- Hand moulding – using your hands to mould the dough.
- Machine moulding – using a brake or sheeter to create consistent dough.
- Laminating yeast dough – folding butter into dough multiple times to create thin alternating layers of butter and dough.

Shaping techniques

There are a variety of shaping techniques that are commonly used for making sweet yeast and basic artisan products. These include the following:

- Crescent
- Plaque
- Rolls
- Loaf



Practice activity

Activity 3.1: Moulding techniques

The below lists some of the moulding techniques you will use in working with sweet yeast and basic artisan dough. These techniques will be demonstrated by your teacher. Make notes about each of the techniques once you have seen the demonstration.

1. Baton shapes are rectangular shape for making loaves. Watch the following YouTube for some instructions (https://www.youtube.com/watch?v=6P_1JHXTdJY)



2. Degassing: This is the action of expelling the gas from the carbon dioxide bubbles that have formed in the dough.

3. Curling/rolling

4. Sealing


5. Scrolls






Practice activity

Activity 3.2: Shaping techniques

Your teacher will demonstrate each of the mould and shaping techniques listed in the table below. Make your own notes for plaque, roll and loaf shaping.

Shape	Technique
<p>Crescent (shape commonly used for croissants)</p>  <p>Croissant by Wow Pho under Pixabay licence</p>	<p>Roll out the dough to a rectangle approximately 12 to 14 mm in thickness.</p> <p>After laminating and resting, roll out the dough to a thickness of approximately 3 to 4 mm and cut into strips of 22 to 26 cm width.</p> <p>Cut these into triangles that have a base of 10 to 12 cm. (Remember, the width of the strip determines the size of the croissant. The length should be twice the width. A wide triangle will yield a flat croissant, while narrow triangle will yield a short fat pastry, leaving the inside unbaked.)</p> <p>Notch the centre of the wide end of the triangle to allow the roll to roll out evenly and to keep a perfect shape.</p> <p>Starting from the base, roll the dough up towards the point, either towards you or away from you. Stretch the point and shape into a croissant shape.</p> <p>Place onto a baking sheet with the loose end placed underneath the croissant so that it will not unravel whilst baking.</p>

Shape	Technique
<p>Plaque</p>  <p>© TAFE NSW</p>	
<p>Rolls</p>  <p>Bread roll by Fotorech under Pixabay licence</p>	
<p>Loaf</p>  <p>Bread loaf by mp1746 under Pixabay licence</p>	

(Continued) Step 5: Final mould, retard, laminate

Laminating yeast dough



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Many baked goods require butter to be creamed with sugar and flour or mixed into the dough. Laminating is the term used to describe the process of folding butter into dough multiple times to create thin alternating layers of butter and dough. Throughout this folding and rolling process the gluten in the flour is developed. When the dough is placed in the oven, the water in the dough and butter converts to steam. The steam helps to puff up each layer of the dough before it evaporates. The fat then fries these layers to create the multiple layers of flaky pastry. When you take a bite of a croissant and you will see all the layers.

Steps in lamination:



Before proof



Proofed layers



Baked layers



Fried layers

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Croissant, Danish and laminated brioche

The croissant and Danish require less mixing than bread doughs; however, it is best to have a very low FDT with some gluten development for the best result. A general guide is that if your flour for instant doughs it requires 10-12 minutes of development, you will need to halve that time for croissant and Danish dough. The rest of the development will come from leaving this dough in the cool room for 10-14 hours (best practice) and then the folding process in laminating.

Dough temperature

The dough for laminated pastry should be kept cold right through its production so it retards fermentation. Refrigeration overnight helps to produce good flavour and means you have cold dough to work with. For refrigeration, the dough should be wrapped in a moist cloth; a plastic sheet tends to induce fermentation by holding in any heat.

Once you begin to work further with the dough, keep it cool. During lamination and cutting, keep in the cool room. If you have large marble slabs, place them in the cool room or freezer, and place on the bench to chill before final run out. This makes the dough easier to work with and stops over fermenting and the butter leaching from its layers. This will also allow for a better cutting and shaping processing. Once the dough starts to prove it will shrink and layers will separate.

Roll-in fats for lamination

The roll in fat used during lamination should be equal to that of the dough.

Standard butter is very difficult to handle, but special laminating butter (fractionised) is ideal. The standard calculation for the addition of roll in fat is between 30-35% of fat to dough weight.

Unsalted butter sheets are the best choice for a roll in fat. It contributes an excellent flavour and aroma in the finished product. Unsalted butter is almost foolproof if used with 1-1½ of salt added to the dough.

Specialty margarines are designed especially for use in croissants and Danish pastry, as they are cheaper to use and have easier handling properties. They have an ideal texture and plasticity for use in croissants and Danish pastries. They are usually a vegetable oil product, have average eating qualities and an average bake-through flavour with reheat properties.

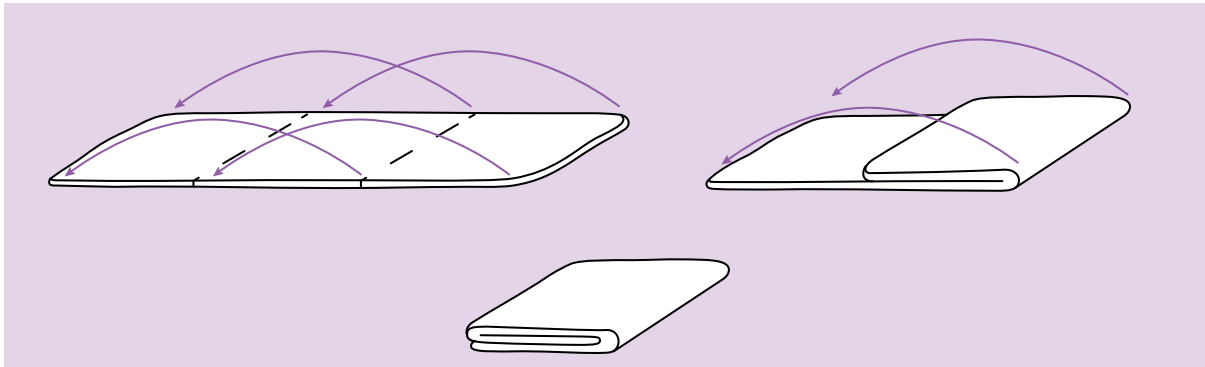
Laminating techniques

There are two main methods of laminating: English method and French method.

English method

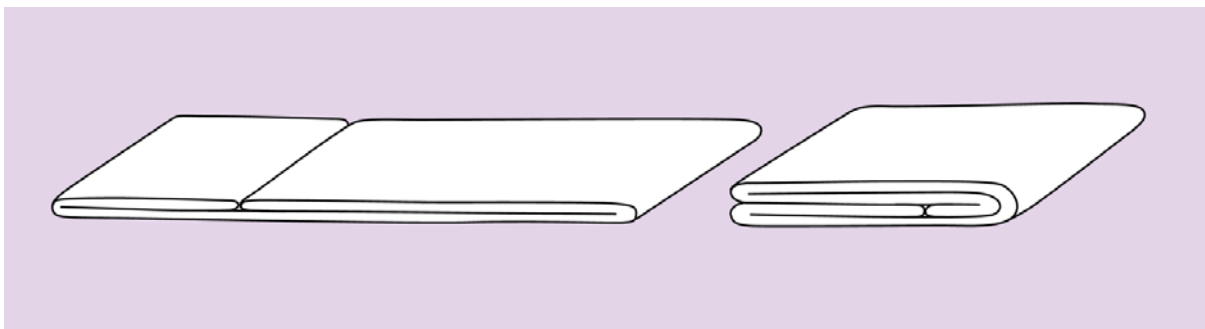
The usual method of fat incorporation is the 'English method', followed by three only x 1/2 turns or two book folds, returning the pastry to the refrigerator for at least 15 minutes between each folding sequence. It is important to use as little dusting flour as possible and to keep the edges and corners of the block true and square.

Half turn pastry fold:



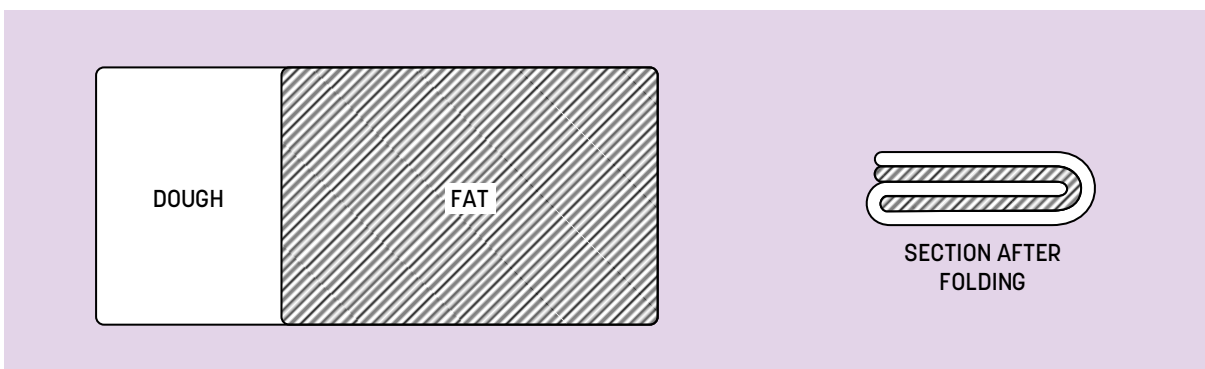
© TAFE NSW

Book pastry fold:



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This following is a variation of the fold in method. This method is a way of folding the roll-in fat into the dough.



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- Roll the dough out into a rectangular shape.
- Plasticise and block the butter into a rectangular shape (use of dough break is good practice), large enough to cover 2/3 of the length of the dough. 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.
- Give a series of three or four fold turns, depending upon the product, resting between each fold.

French method

The French method involves the following steps:

1. Roll the dough out into a clover shape.
2. Plasticise and block the butter) into a rectangular shape (use of dough break is good practice, large enough to cover 2/3 of the length of the dough. 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.
3. Give a series of three or four fold turns, depending upon the product, resting between each fold.
4. If the correct lamination process is not achieved and not enough layers are formed it will create volume, quality and taste problems in your final product.

Cutting and shaping laminated goods

When cutting and shaping laminated dough you will need to prepare by dusting flour over a cool bench to prevent the dough sticking. The cool bench will extend the time that you have to work on your dough and keep it from over-fermenting and butter leaching out.

Use a sharp knife to protect the layers during cutting and cut evenly and accurately to prevent waste.

It is important to work quickly to prevent fermentation and melting of the butter. Remove all excess dusting flour before final shape. Once cut to shape, place excess back in cool room to prevent premature fermentation.



Video clip

Activity 3.3: Lamination

The following video (<https://www.youtube.com/watch?v=YUyOCriFS1c&t=150s>) will show you an example of lamination as croissants are made. After you have watched this, answer the questions below to reflect on what you have learned.

1. What did you already know?

2. What did you learn? List some key points.

3. List any questions you have.

Step 6: Final prove and pre-bake finishing

The final proof is the period of time that elapses between placing the dough piece in the tin and the time when it is ready to be placed in the oven. This stage is the continuation of the yeast fermentation process and allows the dough piece to relax and expand after the previous sheeting and moulding process, where it has been degassed and lacks volume. The aim of this stage is to produce an aerated dough with good shape and volume to meet the quality requirements of the finished product.

Commercial bakeries will have equipment for the final proof stage. These are cabinets or enclosures that are able to maintain desirable temperature and humidity. A temperature range of range of 30–37°C is recommended.

Several factors will determine the amount of final proof that is required for any particular product. These are:

- Fermentation time – long or short
- Nature and strength of the flour
- Type of product that is to be produced
- Shape and size of tins

Proving laminated doughs

Proper proofing is one of the major steps for producing quality laminated doughs. The proving temperature must never exceed the melting point of the roll in fat (butter is best), or else the fat will seep from the croissants. For best results 25°C is ideal, do not exceed 30°C.

The relative humidity must be in the range of 70-75%. There should be enough moisture to prevent skinning. Relative humidity of more than 85% will cause the crust to lose its flaky appearance and the crust colour will turn light and blotchy.

It is good practice to allow the laminated dough pieces to take time in the prover. When the laminated dough has reached desired volume, pre-bake glaze with a combination of egg/milk or egg/cream to enhance the final colour.

Your product may need some form of finishing prior to being baked. This may include the following:

Pre-bake finish	Description
Scoring	<p>Use a knife to score the dough piece to create decorative patterns on the baked product. It may also serve to enable the dough to expand evenly through the baking process.</p> <p>Scoring is done for decorative and visual appeal; however, depending on the product, scoring can prevent the surface from cracking or bursting during the baking process. Scoring, using a razor blade or very sharp knife requires a clean, swift movement and personal care to avoid injury. Cuts should be $\frac{1}{4}$ to $\frac{1}{2}$ inch thick, although scoring methods will differ depending on the product. Using some spray oil on the blade can assist with making sure the knife cuts.³</p>
Seeding	Seeds can be added prior to or after bake.
Dusting	Dusting may be undertaken before and after baking.
Glazing, pastes and washes	These can be done pre-bake or post bake depending on the product.

Step 7: Fry and bake

After all the hard work selecting and preparing ingredients, mixing and processing the dough, the final stage of baking or frying requires careful attention and monitoring.

Sweet yeast and basic artisan products have different baking and frying requirements depending on the product.

You will have already determined that your oven has the capacity for your production requirements and that the oven is the correct temperature to commence baking the product. It is important to be particularly aware of safety of yourself and others when loading pieces into the oven.

The key parameters of the baking process are:

- Time
- Oven temperature

³ <http://bakerpedia.com/processes/bread-scoring/> (accessed 21/09/2018)

- Chamber humidity
- Air flow (convection heating)
- Heat flux

All of these are variable depending on the size, weight, formulation and type of product. Baking times vary depending on the type of oven and product. Oven temperature is dependent on the type, shape and volume of the product required.

You must ensure that your product is placed on an appropriate tray or in a tin depending on the product requirements. Here are some tips:

- If baking a product that is required to be baked in a tin, make sure that you use an appropriate sized tin for the final size of the loaf. As an approximate guide, the moulded loaf should occupy approximately 1/3 of the volume of the tin.
- The tin, unless silicone coated, should be adequately greased with water and salt free shortening, or a commercial greasing medium.
- The shaped loaf should be placed carefully into the tin, taking care that the smooth skin becomes the top of the loaf and the seam is at the bottom. The dough piece should occupy the full length of the tin, as the dough does not elongate during proving and baking.

Tips for baking

Here are some tips for ensuring the baking quality of your sweet yeast and basic artisan products:

- Covering with a sheet of paper or turning down the top heat control can reduce excessive colouring of the product.
- Too much bottom heat can be minimised by using double trays or turning down the bottom heat control.
- Products should remain in the oven until they are baked.
- Monitor the baking process as you go so you can take steps to rectify if needed.
- Generally, the higher the sugar content, the lower the baking temperature. This will retard the caramelisation of the sugar which could result in too much browning.

Steaming

Steaming once the product is in the oven creates additional moisture, which will absorb heat and lower the surface temperature of the dough. This slows the dehydration process and prevents gluten from coagulating too soon so that the dough remains flexible for a longer period of time allowing for it to increase in volume. If a crust forms too early it can restrict the expansion of the dough. This process is only used for some sweet yeast products.

Baking sweet yeast and basic artisan products

The following is a list of key points about baking requirements.

- Due to the high sugar and fat content an oven temperature of approximately 190-220°C is usually most suitable for sweet buns and loaves.
- To prevent crust toughening and possible collapse of the products, steam injection is not used. (Laminated products excluded.)
- Buns should be only baked long enough to prevent collapse or shrinkage after removal from the oven. A soft bake is best.
- The shiny surface usually associated with this type of product is best obtained by washing after baking with a sugar syrup, jam, water icing or bun wash.

Baking of laminated doughs

In the case of laminated doughs made with butter, even if the filling is sweet, a hot oven is used to ensure that the raise and flakiness is achieved. If a cool oven is used the butter will seep out of the pastry resulting in an inferior product.

- Baking temperatures and times will vary between products and the type and condition of the oven. A temperature range of between 190°C and 220°C is the average. A small injection of steam helps to achieve good volume.
- The more sugar in the dough, the lower the baking temperature.
- The higher the roll-in fat level, the higher the baking temperature at the beginning of the baking process.
- The steam from the dough and fat helps to puff up each layer of the dough as it evaporates. The fat then fries these layers to create the multiple layers of flaky pastry.
- The oven needs to be at the correct temperature as the fat needs to be transformed quickly into steam rather than melting/running out of the layers.
- If the fat runs out between the layers, volume will be restricted, and quality and taste impacted as the fat is likely to burn the bottom of the product.

Don't be afraid to bake these products with deep brown colours. This will prolong shelf life and the flavour of the product. There should be no evidence of white/raw dough and collapsing of the product. A good saying to remember for a good pastry is that "if I'm wearing it as I'm eating it", meaning there is flaky crumbs all down the front of you – then the baker has done his job properly.

Baking display dough

When baking display doughs it is important that the dough is baked at a very low temp of 160°C for long periods of time. This is done to ensure the integrity of the colour of the dough and so that the dough doesn't create too much steam and cause cracking. You will need to dry all moisture from the dough to extend the shelf life of the baked product, especially if the product is required to stand for periods of time.



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Sight test bake

Before unloading baked products from the oven, you should check to make sure it has baked as expected. This involves checking the colour as this will provide you with a good indication of whether the oven temperature and baking time has been correct.

Cooling

When your products are removed from the oven, safely unload the baking tray and cool the products on cooling wires. Depending on your product type you may need to apply some finishing while the product is still hot.

Frying artisan products

Some artisan products require frying, such as doughnut and churros.

Previously, hydrogenated shortenings (trans fat) were marketed as the best to use for doughnut production; however, with increasing awareness of health, trans fats are being replaced with vegetable oils. They are more expensive and leave gum deposits on the frying equipment, which can be difficult to clean, but provide a product with a clean mouthfeel and flavour. If a solid fat is used for frying doughnuts, the fat will solidify again when the product cools, which creates poor keeping qualities and taste.

A good quality oil should be used, one that has the following characteristics:

- Doesn't impart any flavour into the product
- Have a smoke point > 195°C
- Be stable during storage and use
- Be reasonably priced

Oil temperature is very important when frying. Here are some tips:

- If the oil is not hot enough it will absorb fat during the cooking process. The oil will be absorbed and make the product greasy.
- When frying doughnuts, steam escapes from the product, stopping fat being absorbed. If too hot, the product will burn rapidly and have a doughy core.
- When frying laminated products for best results you should prove, blast freeze and then bake from frozen. This will help with protecting the layers.

Work, health and safety is important when frying. The following are tips to keep the workplace safe when frying

- Be aware of the dangers associated with frying, such as burns and heat
- Wear personal protective equipment and clothing
- Beware of others around you
- Ensure the work space is clear and uncluttered
- Be conscious of your method of work - don't work across yourself
- Don't 'drop' products from a great height into the oil when frying
- Avoid splashing when turning the products over in oil when frying
- Drain hot products before stacking
- Filter oil when cool
- Cover fryer when not in use

Quality of fried products

The following table shows various faults in fried products and possible causes.

Fault	Possible causes
Undercooked	<ul style="list-style-type: none"> • Cooking time inadequate • Fat temperature too low (thermostats should be checked against accurate thermometer and adjusted where necessary) • Dough temperature too low or 'stand time' too short
Overcooking	<ul style="list-style-type: none"> • Fat temperature too high • Cooking time too long, or doughnut too small for cooking time
Spreading or ringing out	<ul style="list-style-type: none"> • Fat temperature too low • Dough water content excessive • Dough too hot • Inadequate mixing
Balling doughnuts spread	<ul style="list-style-type: none"> • Dough temperature too low • Fat temperature too high
Insufficient volume	<ul style="list-style-type: none"> • Dough over-mixed
Rise too much	<ul style="list-style-type: none"> • Dough water content too low • Over proof • Excessive gluten strength
Excessive fat absorption	<ul style="list-style-type: none"> • Fat deterioration or contaminated • Improper dough preparation • Fat temperature too low, 170oC minimum, 190oC maximum • Fat level too low • Dough water content too high

Fault	Possible causes
Imperfect shape	<ul style="list-style-type: none"> • Fat level too low • Dough water content too low or too high • Poor cutting technique • Rough handling of proved dough pieces • Under/over proof

Step 8: Post-bake finishing

After baking, your products may require finishing such as the addition of toppings, glazings, creams and icings. Simple finishing techniques done poorly can mean a product is visually unappealing and therefore, difficult to sell. This leads to wastage and poor profitability for the bakery.

Display doughs, often used for festivities, can be painted with clear or coloured acrylic paint or food colouring may be added to provide colour.

The following pictures show various faults and good techniques in the visual presentation of sweet yeast and basic artisan products. Many of the faults are caused by hasty and uneven application of finishing. Sometimes simple is best practice. Use the toy soldier principle, the product type should all look the same.

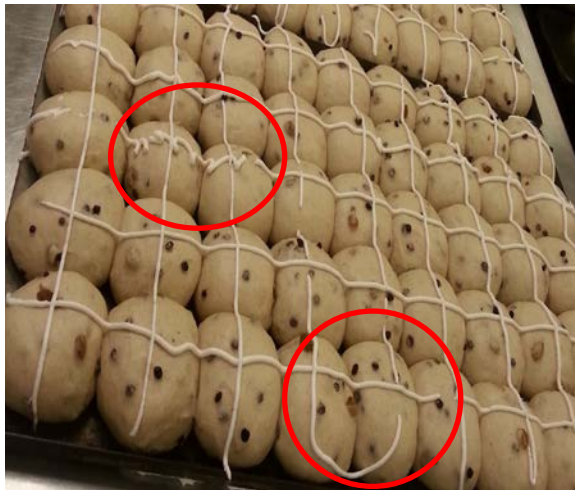
Some of the examples below are not faults, but rather, lazy or lacking imagination.





Faults	Good techniques/visual appeal
	

Faults





Good techniques/visual appeal



Faults	Good techniques/visual appeal
	
	

Faults	Good techniques/visual appeal
	
	
	

Faults	Good techniques/visual appeal
	

Step 9: Present, package, store

Packaging of products should be undertaken only when they have been adequately cooled, otherwise there is potential for the products to sweat, providing a suitable environment for the development of mould. Products can be packaged in a variety of materials including paper bags, cardboard boxes, plastic bags, light weight material and wax paper.

Packaging has the following benefits:

- Reduces possible external damage to the product
- Protects the product from contamination
- Helps to maintain the moisture quality of the product
- Allows for storage, handling, transportation and usage requirements (labelling, brand type, promotion)



Practice activity

Activity 3.4: Presentation and packaging

Take some time to look at some bakeries in your local area or look on the internet for various ways in which sweet yeast and basic artisan products have been displayed or presented.

What did you like/dislike about the way the products were presented?



Self-check questions

Activity 3.5: Check your knowledge

Read the questions carefully and answer in the space provided.

1. Name three different dough-making methods.

2. Explain why an increased yeast percentage is necessary in a sweet dough

3. Name three glazes that can be used to finish a sweet yeast product.

4. Why should the dough for yeast-raised doughnuts not be over conditioned?

5. List two important points to follow when frying doughnuts.

6. What would happen if Danish pastry was not refrigerated between turns?

7. Explain why Danish pastries are baked without steam.

8. Explain why it is important to use cold ingredients when producing croissant dough.

9. Describe the delayed fat method and why you would use it.

10. Describe the straight dough method and the reasons for using it.

Select the answer from the following multiple-choice options.

11. When tempering fondant, what should the working temperature should be?

☐ 30°C

☐ 28°C

☐ 37°C

☐ 45°C

12. Which of the following is not a function of sugar in a baked product?

- | | |
|--|---------------------------------------|
| <input type="checkbox"/> Preserves | <input type="checkbox"/> Crust colour |
| <input type="checkbox"/> Chemical aeration | <input type="checkbox"/> Sweetness |

13. How does sugar improve the crust colour of baked products?

- ☐ Under certain conditions sugar will caramelize
- ☐ Under certain conditions sugar will homogenize
- ☐ Under certain conditions sugar will extend shelf life
- ☐ Under certain conditions sugar will assist aeration

14. The major factor method is used to calculate:

- | | |
|--|---------------------------------------|
| <input type="checkbox"/> Water mass | <input type="checkbox"/> Water volume |
| <input type="checkbox"/> Water temperature | <input type="checkbox"/> Water weight |

15. The delayed fat method is used in the production of:

- | | |
|--------------------------------------|---------------------------------------|
| <input type="checkbox"/> Finger buns | <input type="checkbox"/> Doughnuts |
| <input type="checkbox"/> Brioche | <input type="checkbox"/> Chelsea buns |

Topic 4

Product quality



Topic 4: Product quality

This topic covers how the quality of sweet yeast and basic artisan products is determined and how these products can be stored and presented. You will learn about:

- How to assess the quality of your products
- The factors that lead to the quality of the products
- Faults and rectification
- Storage and presentation of products

To learn about this topic:

- Read the information
- Do any practice activities as instructed by your teacher
- Do the self-check questions
- Talk to your teacher if you need some assistance with this.

The quality of your products are important. Customers come to expect a certain quality and consistency and this encourages them to return to the bakery. Good quality sweet yeast and artisan products look visually appealing and taste great!

The quality of products can be judged by the following characteristics:

- Crumb softness
- Shelf life
- Flavour
- Visual appeal

Using good quality ingredients is important in meeting these desirable characteristics.

Faults and rectification

To ensure quality, it is important to know about the types of faults that can occur and how these can be rectified throughout the baking process. Some faults may be predictable, such as following the order of adding ingredients, hydration levels or fermentation rates.

Checking and monitoring steps in the production process as you go is essential so that you can rectify where possible. Rectification may include steps such as adjusting the formula or adjusting timings for key steps. Keeping a close watch on the production steps can help eliminate or reduce wastage and costs.

Sometimes faults are unpredictable, such as a machinery failure. Where something like this occurs, you will need to determine if this is something that can be addressed quickly or if there are alternative actions you can take, such as doing a task manually or safely storing the unbaked product until the machinery is fixed.



Practice activity

Activity 4.1: Faults

A list of faults are included below. Write the steps you take to reduce the risk of these faults occurring. Include any other faults you are aware of and how you can avoid these.

Fault	Steps to avoid this fault
Machinery failure	
Environmental factors – heat, humidity and cold	
Poor quality ingredients	
Poor oil quality	

Presentation, shelf-life and storage

The bakery needs an attractive, safe and hygienic way of displaying products for sale. Glass display cases keep food fresh and protected while customers can see what you have available for sale. Cases typically open from behind so the server has access the products, but are closed in the front to avoid handling by the consumer. Refrigerated storage options may be necessary to keep some types of products, such as those that contain cream, chocolate, icing and fondant, fresh looking and safe for consumption.

Shelf-life refers to the amount of time that a product remains fit to be consumed or saleable. Ingredients in the product and food safety requirements will dictate the shelf-life of many products in the bakery.

Products are usually packaged either prior to sale or once they are sold, so the customer can easily and hygienically take them without damaging or contaminating the product. Ensure that your product is suitable for the packaging material and able to maintain the quality customers expect. Various types of packaging materials can be used, such as plastic containers, plastic wraps, foam trays, plastic bags, cardboard trays, paper bags, cardboard boxes, greaseproof paper, perforated paper or plastic bags can be used for carry-out orders and delivery of baked goods.

Plastic containers can be used for storing goods in cool rooms or refrigerators. Care must be taken in recording production dates and applying use-by dates to ensure that products unfit for consumption are not sold. Failure to follow food safety requirements for storage and use of products can result in penalties for the bakery and will have an impact on the reputation and viability of the business.

The reasons for packaging products are:

- to help regulate the moisture content in the product
- to protect the product from contamination
- to protect the product from physical damage

Sweet yeast products can be frozen when they are fully or partly baked and ready for consumption or for finishing. Unbaked goods, such as dough, croissants and Danish pastry, can also be frozen.

Freezing yeast products

- 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.

- Dehydration will occur if the humidity in the freezer is low before the freezing point has been reached.
- 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 its colour and texture.
- Temperature of -20°C and lower is recommended for long term freezing and temperatures of -15°C to -20°C are suitable for short-term storage.
- Fillings and toppings must have the ability to freeze-thaw.
- If a product has been thawed, do not re-freeze it because the harmful bacteria will increase in quantity and spoil it.



Practice activity

Activity 4.2: Research

Research the following products below to identify shelf life and storage requirements.

Product	Shelf life	Storage requirements
Croissants - laminated		
Danish - laminated		
Lean crusty doughs		
Basic artisan display plaques		
Enriched basic artisan products		
Fried basic artisan products		

Presentation and storage

Presenting your products so that they are appealing to the customer is essential for business. The bakery needs an attractive and hygienic way of displaying and delivering baked products to the customer. Glass display cases or small stands keep food fresh and protected while customers can see what you have available for sale. Cases typically open from behind so the server has access but are closed in the front to avoid handling by the consumer. Refrigerated options may be necessary to keep some items fresh, particularly where dairy products have been added as fillings or toppings.

The reasons for packaging products include:

- to help regulate the moisture content in the product
- to protect the product from contamination
- to protect the product from physical damage

Various types of packaging materials are used, such as plastic containers, plastic wraps, foam trays, plastic bags, cardboard trays, paper bags, cardboard boxes, greaseproof paper, perforated paper or plastic bags.



Self-check answers

Activity 4.3: Check your knowledge

1. Name three things you would look at when assessing the quality of a finished sweet yeast or basic artisan product. List three things to be aware of when freezing sweet yeast and basic artisan products.

Topic 5

Packing up and cleaning down



Topic 5: Packing up and cleaning down

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

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

To learn about this topic:

- Read the information
- Do the practice activities as instructed by your teacher
- Do the self-check activity
- Talk to your teacher if you need some assistance with this
- Look at the additional resources.

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.

Cleaning equipment and your work area

Cleaning equipment so that it is ready to use for the next day or next time is an important step in your work routine.

Equipment may include machinery and electrical equipment, kitchen implements and tools, baking tins and trays, racks, ovens, bench tops, walls, sinks, storage shelves, display cabinets and floors.

It is important to work safely and follow your workplace instructions when cleaning. You can do this by:

- Understanding the toxicity of any cleaning materials you are using – MDS sheets
- Using personal protective equipment to prevent skin reactions and injury
- Working safely, especially with water near electrical equipment
- Ensuring all equipment and products for cleaning are used correctly and re-stored after use

- Ensuring you use signage on mopped floors
- Following workplace instructions if more cleaning products are needed or there are any difficulties with cleaning any products.

Completing workplace records

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, such as storage temperature readings
- Stock records, such as stock that has been sold and/or disposed of.

Disposing of waste

Bakery waste includes food products, water and packaging material. By following a production schedule and recipe formula and measuring accurately, you will reduce the likelihood of wasted ingredients and products. Stock that 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.



Self-check questions

Activity 5.1: Check your knowledge

Read the questions carefully.

1. Give examples of how you disposed of waste when making sweet yeast and basic artisan products.

2. What steps can you take to ensure that you have production wastage of less than 5%?

Appendix 1: Production schedule

Dough no.	White	No. of pieces	Weight	Shape required	Weight for each	TDW	Notes
1							
2							
3							
4							

Glossary

Term	Definition
Absorption	This refers to the amount of liquid that may be soaked up by flour in dough.
Additives	An additive usually helps in the performance of the dough or improves the final product and is added to the basic ingredients.
Amylase enzyme	Enzyme that aids in turning starch into sugar.
Baba	Small yeast-raised cake soaked in syrup and decorated with whipped cream.
Blister, blistering	This is a small hollow space under the top crust of the product.
Brioche	Rich yeast-leavened dough, shaped large or small.
Casein	Dairy protein.
Celsius	Represents a scale in which the freezing point of water is 0°C and 100°C is the boiling point.
Cinnamon	It is an aromatic bark and the eldest of spices.
Clearing/clear window	It is the final mixing of ingredients to form a dough or batter.
Cloves	A spice. They are the dried flower buds of a tree.
Crème	Cream.
Croissant	A crescent shaped roll made from laminated yeast dough.
Crumb	This is the inner portion of a pastry, cake or loaf other than the outer crust.
Damper	Device used to control the amount of steam or air in the oven.

Term	Definition
Develop dough	To enable the gluten strands in dough to stretch, thereby producing smooth and elastic dough.
Dough	A term used to describe a mixture of flour and water that may or may not be fermented.
Dough divider	Equipment used to divide pieces of dough into equal pieces
Egg wash	Plain whole egg, or egg mixed with milk or water. Used for glazing pastries or enriched breads before they are baked. Egg yolks may be used for a darker, richer colour.
Emulsification	Process of two or more liquids combining (usually oily and watery).
Enriching agents	Ingredients such as fat, eggs, milk, which are added to enrich a dough.
Enzyme	Enzymes are simple proteins that act as catalyst for chemical reactions so in bakery, they assist with reactions in breaking down starches to simple sugars and strengthen gluten.
Ferment	A mixture of flour, sugar, yeast and water which is allowed to ferment before being used to make the main dough.
Fermentation	The reaction in a yeast dough during which sugar is converted to ethyl alcohol and carbon dioxide.
Final proof	The last stage of the dough rising before the product is baked.
Gelatinisation	Starch granules swell during the baking process and absorb water. The process assures the quality of the crumb structure in bread products.
Glutathione	Naturally occurring chemical found in flour.
Gluten	A tough, rubbery substance formed when flour is mixed with water. It serves as the structure for all products made with flour.

Term	Definition
Grease	The brushing of fat onto baking trays, moulds or tins.
Humidity	Refers to the moisture in the atmosphere.
Homogenisation	Process where fat droplets from milk are emulsified and cream does not separate.
Hydrogenated fats	Type of fat created by adding hydrogen to liquid oils.
Hygroscopic	Capable of attracting moisture from the atmosphere — sugar/salt are hygroscopic.
Icing sugar	Powdered sugar.
Knock back	To expel gas from a fermented dough.
Maillard reaction	Chemical reaction that creates browning.
Marzipan	A paste made from almonds and sugar.
Non-fat milk solids	Ingredient that helps to provide a more palatable texture and taste.
Oxidation	The effect of oxygen on a product.
Par baked	Partially baked.
Pasteurisation	Treatment of heat to prolong shelf life.
pH	This is a figure that identifies the acidity or alkalinity of a water soluble substance.
Pre-conditioning	In the bakery, this means heating the fruit prior to cold storage to extend shelf life.
Rancid	Oxidisation of fats and oils in food items usually caused by exposure to air, light, light moisture or bacteria. This can create an undesirable odour and taste.

Term	Definition
Scaling	Weighing pieces of dough.
Shortenings	Solid fat used to prevent the formation of gluten matrix, used in the production of a range of bakery products, such as pastries.
Skinning	The hard, dry crust, which forms on dough when it is left uncovered.
Smoke point	The temperature at which oil starts to burn.

Additional reading

Resource	Details
NSW TAFE Catalogue and e-Resources	There are a range of electronic resources and books that you can access through the TAFE NSW Library. Check out the catalogue online for more details or see the Librarian at your TAFE campus.
Reinhart, P 2016, The Bread Baker's Apprentice, 15th Anniversary Edition: Mastering the Art of Extraordinary Bread, 15th anniversary edition. First revised edition, Ten Speed Press, Berkeley.	Link to TAFE NSW e-Resources Link to this resource Information on baking bread – techniques and step by step photographs.
Figoni P. How Baking Works: Exploring The Fundamentals Of Baking Science [e-book]. Hoboken, N.J.: John Wiley & Sons, Inc. [US]; 2011. Available from: eBook Collection (EBSCOhost), Ipswich, MA.	Link to TAFE NSW e-Resources
Gisslen, W, & Smith, JG 2017, Professional Baking, Seventh edition, Wiley, Hoboken, New Jersey.	Link to this resource
http://bakerpedia.com/	Wide range of information on bakery including free downloadable e-books.
https://www.bakeinfo.co.nz/	Website that is run by the Baking Industry Research Trust in New Zealand. Has facts, hot topics and recipes.

Resource	Details
The Bake Station	<p>TAFE NSW e-resources</p> <p>The Bake Station is a 14 minute video that has the following segments:</p> <p>Specialized Baking Equipment and Tools 02:24</p> <p>Chef's Clothing Protects from Burns 00:28</p> <p>Bake Station Ingredients and the Process of Fermentation 01:50</p> <p>Large Bakeries and the Process of Scaling Dough 02:14</p>
Food Safety and Hygiene Video	Information about food safety and hygiene
Australia and New Zealand Food Safety Code	Information about food safety
NSW Food Authority Keeping food safe	Information about food safety
NSW Food Authority	Information about food safety
Safety starts with you	Safework NSW
Western Australia Department of Mines, Industry Regulation and Safety - Bakeries	Safety
Australian Government National Measurement Institute - Guide to the sale of bread and bakery products	Measurement requirements in Australia for sale of bread
Making croissants	TAFE NSW - Hunter Institute
How to make croissants	TAFE South Australia

References

Title	Link
Bakerpedia	http://bakerpedia.com (accessed 23/08/2018)
Warm Chef – oven spring	https://warmchef.com/?s=oven+spring (accessed 23/08/2018)
Australia and New Zealand Food Safety Code	http://www.foodstandards.gov.au/code/Pages/default.aspx (accessed 23/08/2018)
The Kitchen	https://www.thekitchn.com/what-is-laminated-dough-211917 (accessed 23/08/2018)
FDFRB3014A - Produce sweet yeast products (version 1)	TAFE NSW (2012)

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