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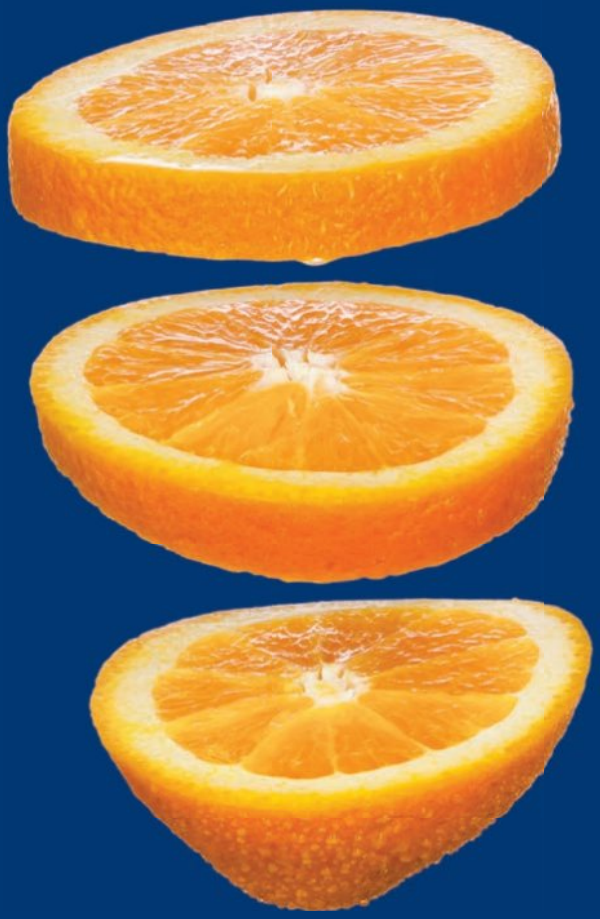

1 BOOK

Sally Lasslett and Chrissy Collins

Consultant: Andrew McVittie

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Cambridge University Press

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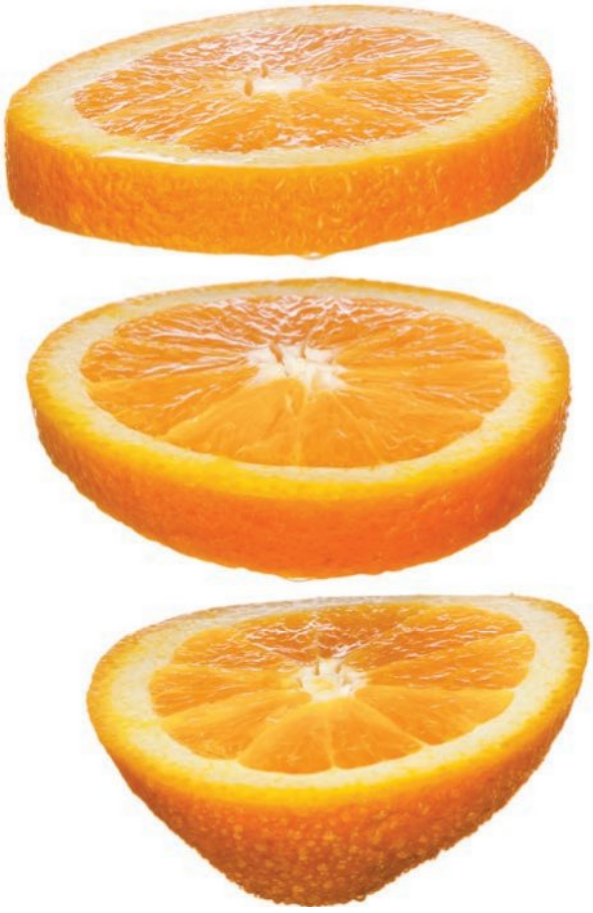

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Please be aware that this publication may contain images of Aboriginal and Torres Strait Islander people now deceased. Several variations of Aboriginal and Torres Strait Islander terms and spellings may also appear; no disrespect is intended. Please note that the terms 'Indigenous Australians' and 'Aboriginal and Torres Strait Islander peoples' may be used interchangeably in this publication.

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Foreword

Achieving a healthy lifestyle through a balance of work, exercise and nutritious meals continues to grow as a priority for millions of Australians. Finding that balance can be difficult for home cooks, as they seek to produce healthy, nutritious meals that not only look appetising, but also taste great and meet the specific dietary needs of everyone in the home. There continues to be a need to assist families in making educated choices about food and health, and how to best manage these in our increasingly busy lives.

Australia, as a multi-cultural society, has access to cuisines from all over the world. Being one of the world's most fertile and wide-ranging producers of fresh food products also allows us access to high-quality produce year round – a luxury many other countries do not have. Australian farmers and producers are, out of necessity, becoming innovative in what they grow, as nutrition and diet become increasingly important issues in our lives.

The popularity of reality TV cooking shows, as well as the celebrity status of local and international chefs show us that anyone with the desire and the determination can become more than 'just a home cook' (a role that is still very undervalued). It also provides an opportunity for teachers and students to be better equipped to replicate and/or improve on foods they see in the media.

This highly visual and engaging textbook provides information to help you make informed food choices for improved health and well-being. This is particularly important given the high levels of obesity in young people and the dramatic rise in juvenile diabetes across Australia. As fast food outlets expand their reach it's important to have a broad understanding of nutrition and which foods are more beneficial than others. Many schools are looking to provide the knowledge for families to create their own food-producing gardens and these texts assist students in becoming teachers themselves, to guide their families to better life choices.

The Australian Curriculum, Assessment and Reporting Authority (ACARA) has allocated Food and Nutrition into the Health & Physical Education subject area and Food Design into the Technology area, but both remain vital subjects for Home Economics teaching and learning. Home Economics should have a place in every secondary high school and college as the subject matters covered are fundamental life skills for all students.

The authors of this revised edition of *Food for You* have sought to present a comprehensive range of informative chapters, covering the required areas of the impending new curriculum. As you progress through the textbook, you will learn the basics of all the food groups and interesting activities and research tasks will improve your knowledge and skill. The chapters include references to online resources, fascinating facts and figures, high-quality photos and graphs, a comprehensive glossary, as well as many primary and secondary sources. The included Interactive Textbook includes videos and multimedia resources to enhance learning.

The authors are sure that you will find this textbook not only useful in your studies, but relevant to your own life. Food can be one of life's greatest pleasures, particularly when enhanced by the knowledge that you have made food choices that positively impact you and your family's health.

Andrew McVittie

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About the authors

Sally Lasslett

Sally has been teaching Food and Technology and Health and Human Development for over 20 years. She is currently the principal at Wallan Secondary College and is an active Home Economics professional with a passion for the VCE and VCAL curricula. Sally has coordinated a Food and Technology online network, regularly presents professional development seminars, has been an exam marker and SAT reviewer, and has also been on the selection panel for Top SATs. Sally continues to co-author a number of Food Technology, Health and VCE Health and Human Development textbooks and revision texts.

Chrissy Collins

Chrissy is a passionate Home Economics and Health teacher. She has written and presented numerous professional development sessions in Home Economics and Health, both locally and internationally, with a focus on Home Economics education, e-learning, and student motivation and engagement. An experienced exam marker and SAT reviewer, she has also co-authored Food, Health and VCE Health and Human Development textbooks, and had a student in Top Designs. Chrissy enjoys teaching both junior and senior students, inspiring their love of food, health and wellbeing, and ensuring that students flourish and thrive.

Consultant: Andrew McVittie

Andrew has been a Home Economics/Hospitality teacher for 10 years at Caloundra Christian College in Queensland, having left a 22-year career in the hospitality industry to pursue a lifelong desire to be a teacher. As well as coordinating a number of subject areas within the college, he is involved in committee activities interstate, through Home Economics Victoria, and internationally, through the International Federation of Home Economics. Andrew's vision for the future is to encourage more male students into Home Economics at both the secondary and tertiary levels. He hopes that he will be able to facilitate this through his own role-modelling and mentoring of young male Home Economics teachers, both here and overseas.

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Sally Lasslett

I would like to thank my wonderfully supportive husband, Grahame, and my two boys, Callum and Hudson, who helped me with recipe development throughout this project. They are my inspiration and provide me with love and assistance always. Also to my wonderful writing partner Chrissy, it brings joy to my day to be able to work with such a wonderful friend on these projects. I am also very grateful to have had the best role model and inspiration in Home Economics, Glen Perraton, a woman determined to achieve who instilled in me a passion for home economics and curriculum writing, and always encouraged me in leadership. You are sadly missed, still!

Chrissy Collins

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How to use this resource

Let's collaborate tasks encourage collaboration between students, while also deepening knowledge and understanding.

Glossary terms are bolded in the text, defined in the margins and collated at the end of the textbook for easy reference.

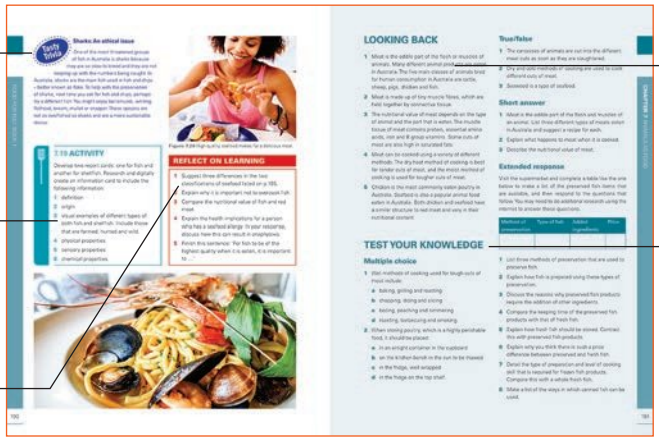
Tasty trivia boxes highlight interesting information to enrich your learning.

Access prior knowledge at the start of each chapter focuses your attention on the topic being studied.

Information and activities on food production help you make **ethical and sustainable food** choices.

A variety of **Activities** and **Investigate IT** tasks explore key concepts, develop skills and link back to the general learning capabilities and cross-curriculum priorities.

Reflect on learning activities finish each topic to consolidate learning throughout the chapter.



Looking back chapter summaries review the main ideas of the topic to reflect and consolidate on what you have learned.

Test your knowledge questions at the end of the chapter reinforce key concepts and the application of skills.

Design thinking and **Create a solution** features encourage the use of the design process and allow students to explore ideas and solve problems while producing design solutions.

Flags on recipes show the country of origin (where it can be determined).

Carefully timed **recipes** include step-by-step methods and recognisable ingredient images. Each recipe identifies production skills, cooking processes and the main tools and equipment needed. In most cases, you are also asked to evaluate your understanding and skills.

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Ethical and sustainable food consumption and production

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Getting started

0.1 Equipment used for measurement

Successful food preparation is based on understanding when accurate measurements are necessary and the importance of measurement to gain consistent results.

Measuring equipment used for food includes measuring cups, measuring spoons, measuring jugs and scales. In Australia, the cups, spoons and jugs are based on Australian Standards of measurement. When a cup or teaspoon is referred to, it does not mean a cup a family member might use for their tea or coffee, or the teaspoon you use daily, as these can vary considerably in size.

There are different types of scales, from the older style and traditional balance scales to very accurate electronic digital scales. Scales are used to measure weight.

Tasty Trivia

The oldest examples of weighing scales were found in the Indus River Valley (today Pakistan) and were used more than 4000 years ago. Until Bernard Salter invented the first spring scale in 1770, all scales were variations of the balance scale.

In recipes, several abbreviations are used to describe quantities of ingredients. Abbreviations are shortened versions of a word, such as 'kg' for kilogram and 'tsp' for teaspoon.

If you are using a recipe from an American site on the internet or a very old recipe, it may have measurements in ounces ('oz') or pounds ('lb') for solids and 'pints' or fluid ounces ('fl oz') for liquids. They are measurements of the imperial system, which was once used in Australia and is still used in some other countries. Today in Australia, we use the metric system.

Figure 0.1 Traditional balance scales

Figure 0.2 Spring balance scales

Figure 0.3 Electronic digital scales

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Equipment used for the different measurements

Measuring liquids

millilitre: ml litre: l

Measuring weight

gram: g kilogram: kg

Measuring volume

cup: C
tablespoon: tbs
teaspoon: tsp

Measuring oven temperature

Celsius: °C

Measuring length/height/width

millimetre: mm centimetre: cm

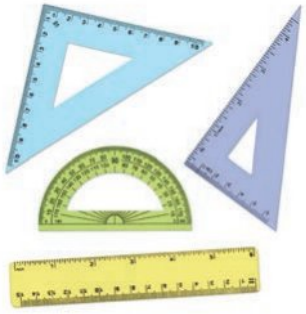

Figure 0.4 Equipment used for the different measurements

0.2 Measuring dry and liquid ingredients

Accurate measurements could make the difference between success and failure in the kitchen, especially when you are baking. There are specific techniques to help you ensure that your measurements are correct.

Measuring dry ingredients

Equipment used to measure dry ingredients, such as flour, salt and sugar, consists of measuring cups, measuring spoons and scales.

Measuring cups consist of 1 cup, ½ cup, ⅓ cup and ¼ cup. The measuring cups also have millilitre measurements on the handle and record the millilitre quantities for each cup. Note, though, that these cups are not used for measuring liquids. Why do you think this may be the case? For example, try to use the 1 cup to measure 250 ml of water. What difficulties may occur? In recipes, the term 'millilitre' is not used, but the abbreviated version, 'ml', is used.

When measuring dry ingredients using cups, place the ingredient in the cup until it overflows and use a palette knife or spatula to level off the top. Do not pack the ingredients into the cup.

Cup measurements will give varying weights of different dry ingredients. Some dry ingredients will pack together more closely than others. The same cup will hold a larger weight of different kinds of the same food. Sugar is a good example to use when testing this. Look at the following sugars and try to predict which cup will weigh the most and which will weigh the least: 1 cup

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Figure 0.5 If you use the correct technique, you will be assured of accurate measurements.

brown sugar, 1 cup icing sugar, 1 cup granulated or A1 sugar and 1 cup caster sugar.

Measuring spoons are used for smaller quantities of dry and wet ingredients. For dry ingredients, a spatula or palette knife is also used to level off the ingredients to ensure accurate measurement.

0.1 ACTIVITY

Measuring cups

Identify the cup/s you would use to measure ¾ cup of flour and 1¼ cups.

Measuring liquids

Measuring spoons are used for smaller quantities of dry and wet ingredients. When collecting wet ingredients such as soy sauce or oil, make sure you collect the liquid over a larger cup or small bowl to avoid spills.

Figure 0.6 For accuracy, check the quantity of liquids at eye level.

Measuring spoons also have millilitre measurements on them. This is useful for measuring small amounts of liquids.

Check the millilitre (ml) measurements on measuring spoons. The Australian Standards tablespoon is 20 ml. If the measuring spoons have been made in another country, the tablespoon may only be 15 ml, as this is the quantity used in many other countries, such as the United Kingdom.

0.2 ACTIVITY

Measuring liquids

1 Explain why is it important to measure liquids over a cup or bowl.

2 Identify the spoons you would use to measure 15 millilitres and 25 millilitres.

Larger amounts of liquids are measured using a measuring jug. Australian Standard measuring jugs are 250 ml, equivalent to 1 measuring cup or 1 litre (1000 ml). When measuring liquids, pour the liquid into the jug while it is sitting on a flat surface and check the quantity at eye level.

0.3 Stoves

Electric or gas stoves are the main cooking equipment used in the kitchen. There is considerable variation in the design of stoves, with options on the controls to make the food-production techniques simpler or more efficient.

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The basic stove consists of three main design features: a stove top, an oven and a griller. These may be combined into one unit or two, or possibly even three, separate units. Stoves are designed to do the basic cooking functions referred to throughout the text, such as **boiling**, frying, stewing, baking, roasting and grilling. The first three methods usually take place on top of the stove. Stewing can also occur when the food is cooked in the oven. Baking and roasting occur in the oven. Grilling is done under the griller. Each method uses different containers and cooks food in a different way.

Stoves cook food by **convection**, **conduction** and **radiation**.

boil To cook in water or liquid with the water bubbling above 100°C.

convection Cooking food by the circulation of hot air or steam, such as in an oven or a steamer.

conduction Cooking food by heat transference through a flat metal surface onto the food or liquid – for example, frying, poaching or grilling.

radiation Cooking food by direct heat from a flame or element, such as in a griller, or when electromagnetic waves pass through food, such as in a microwave.

Figure 0.7 Stove tops found in modern homes. Which type are you most familiar with?

0.3 ACTIVITY

Getting to know the stove

1. Locate the different design features one usually finds on a stove.
2. Draw the stove you work with most often and annotate your drawing with the different parts of the stove.
3. List the safety issues that relate to each part of the stove.
4. Identify an example of a food that can be cooked using each part of the stove.

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Safety with stoves

In order to prevent **burns** and scalds, remember to do the following:

burn Damage caused to the skin by something hot.

- Turn the handles of saucepans towards the back of the stove.
- Use the back hot plates on the stove before using the front.
- Choose the right-sized burner for the piece of equipment you are using.
- Use dry oven mitts, not tea towels, to remove hot trays from the oven.
- Carry large pots of hot liquid or food with two hands.
- Do not remove the lids from saucepans while your face or hands are over the saucepan; this will avoid steam burns.
- Do not overfill saucepans – choose the right piece of equipment for the right job.
- Do not leave hot fat or oil unattended.
- Do not leave tea towels, oven mitts or other flammable items close to a stove that is turned on.
- Be careful when lighting an oven or a stove, particularly a gas stove.

Oven temperature control

One example of a design feature is the temperature control for an oven. Many recipes just instruct the user to cook at 'moderate' heat or to cook in a 'hot' oven.

Figure 0.8 Do you understand the markings on this temperature control knob?

Stove top and oven equipment

There are many pieces of equipment that can be used when cooking in the oven and on the stove top. Careful selection is necessary to ensure success.

Figure 0.9 Silicone bakeware is naturally non-stick and flexible, and easy to clean.

Figure 0.10 Stainless steel cookware is strong and resists wear and tear. Not all stainless steel cookware can be used on induction stove tops.

Figure 0.11 Ensure that you use the correct size and type of bakeware pan as specified in the recipe; otherwise you will have to adjust cooking temperatures and time.

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0.4 ACTIVITY

Equipment and safety

1. Select four different pieces of kitchen equipment and describe how each one can be used in food production.
2. List two safety features for each piece of equipment.
3. Suggest an alternative piece of equipment that could be used for each of your examples.
4. Discuss and compare your equipment information with that of your partner.

0.4 Microwaves

The microwave oven is one of the greatest kitchen equipment inventions. Just think of how many times you have used the microwave to cook or heat food and drinks.

Microwaves provide an alternative for cooking food, although the design features have limitations in cooking some foods.

The food cooks in a microwave by electromagnetic waves passing through the food. The food absorbs the energy from the waves and the cell structure of the food vibrates very quickly, causing the food to heat and therefore cook.

Microwave cooking equipment

When cooking food, each equipment selection for cooking will have advantages and disadvantages, and these will vary with different foods or different outcomes.

For example, microwaves lose their efficiency when a large quantity of liquid is involved or long, slow cooking is necessary.

Figure 0.12 A large variety of microwave equipment is available – remember that it cannot be metal.

Tasty Trivia

The first microwave ovens were the size of a refrigerator.

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Microwave cooking

	
• Microwaves are quick for heating food that is already cooked (best for small amounts).	• Metal equipment cannot be used in a microwave. Only specialist microwave containers should be used, such as microwave-safe plastics, glass and ceramics.
• They are good for cooking small quantities of vegetables with minimal liquid, so there is minimal nutrient loss.	• Browning and crisping of foods will not occur unless there is a special feature, so microwaves are not recommended for cooking pastry or meats that require browning.
• Cooking is faster for many items – they can reduce cooking time by 60–70 per cent, therefore saving energy and time.	• Some foods, such as meat stews, require a long, slow cooking process to develop their flavour.
• Snacks and small meals can be prepared quickly.	• Accurate timing is essential. A difference of seconds can have drastic consequences – for example, if melting chocolate or butter.
• Foods can be defrosted.	• Food to be cooked needs to be of an even size for even cooking.
• Washing up is easier because food is cooked and served in the same dish	• Cooking items with a large amount of water is less economical, and in fact may take the same amount of time as other methods – for example, cooking rice.
• The food can be cooked and served in the same dish.	• It is difficult to cook large quantities.
• Minimal skill is required for preparation or heating a snack or quick meal.	

Figure 0.13 A microwave oven is a very useful implement, but it is not always the best option for what you want to do.

Microwave safety

When using the microwave, always remember the following:

- Foods and liquids in the microwave can reach scalding temperatures very quickly. The heat is often uneven, so it is important to shake, stir and stand the contents carefully before serving.
- When food is heated or cooked in a covered container, steam that can scald is trapped inside. Remove the lid or plastic covering from the far side of the container so that the steam rises away from you.
- Do not use glass bottles to cook foods in the microwave as they can crack or even explode.
- Do not use metal bowls, aluminium foil or plates with a silver or gold trim in the microwave, as these items can cause sparks and even fires.

0.5 ACTIVITY

Stir-fry processes

Look at the Beef and Vegetable Stir-Fry recipe and make a list of the processes required in this recipe. These are the actions that need to be carried out for the final product to be produced. Provide a definition for each process you have identified.

0.5 Food-preparation techniques

A process is a series of actions carried out in the cooking or production of food. These processes are aimed at developing a final food item.

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Beef and vegetable stir-fry

CHINA

RECIPE

Main tools and equipment

Chef's knife, measuring spoons, measuring jug, chopping board, small bowl, wooden spoon, wok

Production skills

Measuring, slicing, mixing

Cooking processes

Stir-frying

SERVES 2

Preparation: 10 minutes

Cooking time: 5 minutes

Serving and presentation: 3 minutes

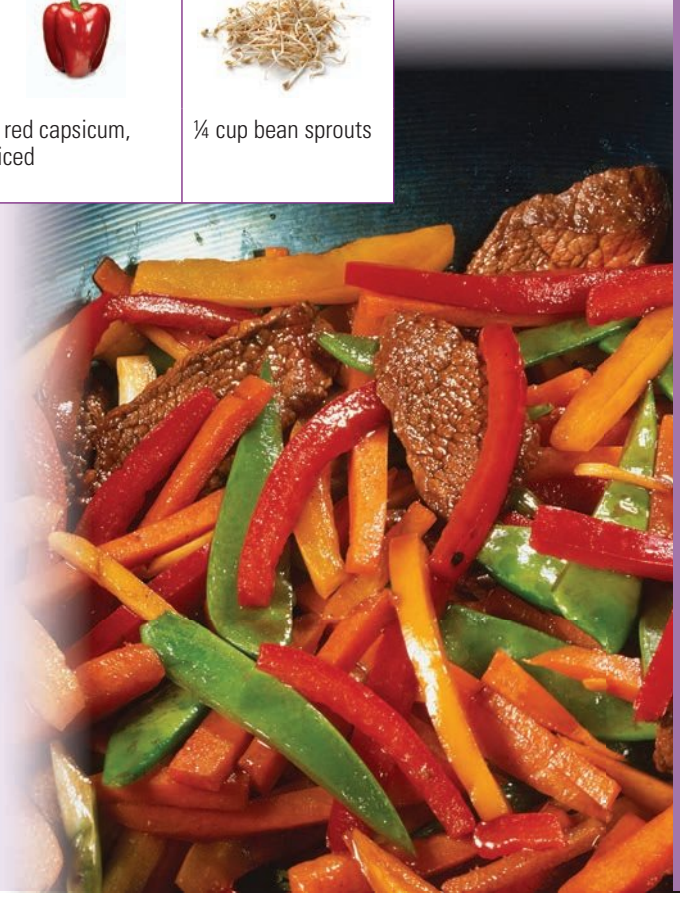
Total time: 18 minutes

Ingredients

 ½ teaspoon cornflour	 ¼ cup beef stock	 1 tablespoon oyster sauce	 1 clove of garlic, crushed	 ½ teaspoon sugar	 1 tablespoon sesame oil
 175 g rump steak, finely sliced	 125 g beans, topped and tailed, cut into 5 cm lengths	 ¼ onion, sliced	 ½ red capsicum, sliced	 ¼ cup bean sprouts	

Method

1. In a small bowl, dissolve the cornflour in half of the beef stock.
2. Add the remaining stock, oyster sauce, garlic and sugar.
3. Heat oil in a wok; stir to coat the base and the sides.
4. Add beef, stir-fry over a high heat for 2 minutes or until the colour of the meat changes.
5. Add beans, onion and capsicum and stir-fry for another minute.
6. Add the cornflour mixture and cook until the sauce thickens.
7. Stir in the bean sprouts.
8. Serve with steamed rice.



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0.6 LET'S COLLABORATE

Think about the actions that need to be carried out to make a cake. List these actions and compare your list with that of the person beside you.

0.6 Cooking processes

Many of the processes and culinary terms used in cooking are based on French cooking.

If we think about particular food items, there are many processes or actions that can be carried out on that individual item.

Some other basic processes used in the preparation of the recipes that you will find throughout this book are:

- blending
- dicing
- simmering
- baking.

Carrot, grated

Carrot, sliced

Carrot, diced

Carrot, julienned

Figure 0.14 Four processes that can be carried out on a carrot

There are hundreds of pieces of equipment that can be used to carry out a range of processes.

Let's look at a grater (Figure 0.15).

Figure 0.15 A grater can be used to grate cheese in many different sizes for a huge range of final products.

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0.7 Sensory analysis

Food should be eaten for enjoyment. Your favourite foods and the meals you remember are those that delight all your senses!

The sensory properties of food are related to the human senses, as outlined in Figure 0.17.

Our appreciation and enjoyment of food is based on the food's sensory properties. When we evaluate foods, we draw on these sensory properties and use our own senses to make judgements about whether we like or dislike a food item.

Appearance

Consumers are often quick to judge food by its **appearance** or that of the product's packaging. Sight is the dominant sense and accounts for 80 per cent of our experiences. It is very important that the food appeals to the senses when designing and creating food products. Have you ever seen any foods that didn't look right? Did you eat them?

appearance The 'look' of the product, packaging or food.

Consumers often have an expectation of how a food should look, and if it does not meet expectations, it is often not consumed. For example, a high-quality risotto will look creamy and be a white colour. If you were served a grey risotto, would you eat it? The colour of the dish highlights that it has not been produced correctly.

Aroma

Have you ever smelled onion or garlic cooking? **Aroma** plays an important role in our experience of food. In fact, when selling homes, many real-estate agents have muffins or cakes baking in the oven, or use the smell of cooking to make a kitchen feel enticing and comforting. Often the aroma of food can bring back memories of past food experiences. This can be positive or negative. While aroma is often used to enlighten the senses, it can also be used to make judgements about food and food quality. Have you ever smelled milk to see whether it was spoiled before you used it?

aroma The smell arising from the food.

Taste

We eat food for the **taste** and pleasure it can give us, as well as for the **nutritional** benefits. There are five basic tastes: sweet, salty, sour, bitter and **umami**. Flavour is a combination of taste and aroma, with the mouth and nose sending signals to the brain.

taste The sense that perceives the flavour or savour of things using the mouth and tongue.

nutrition The science that studies the interaction between our bodies and food.

umami The savoury flavour or taste sensation of food.

Figure 0.16 Do the colours of these hybrid cauliflowers make them more appetising?

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Texture (mouthfeel)

The texture of food (**mouthfeel**) is the feeling created inside your mouth: biting, chewing and swallowing. Think about eating a piece of chocolate. It is smooth and coats the roof of your mouth with a rich texture. Consumers enjoy the different textures that foods provide, and in a well-planned product or meal there will be ingredients that provide different textures from others to make the food interesting to consume; for example, the crunch of lettuce in a salad compared with the moist softness of a ripe tomato.

mouthfeel How food or drink feels in the mouth – the sensory evaluation of impressions on the palate.

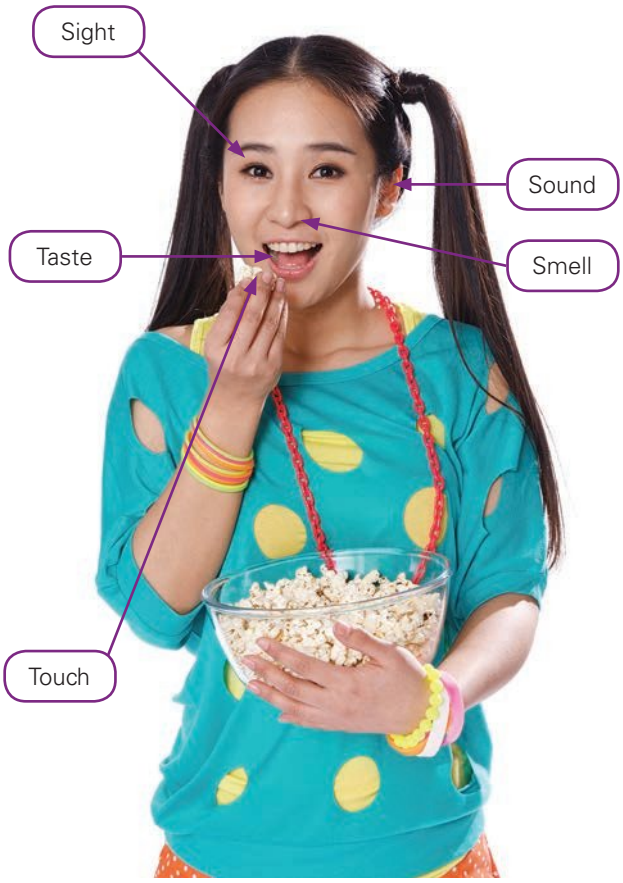

Figure 0.17 Sensory properties of food relate to the five human senses.

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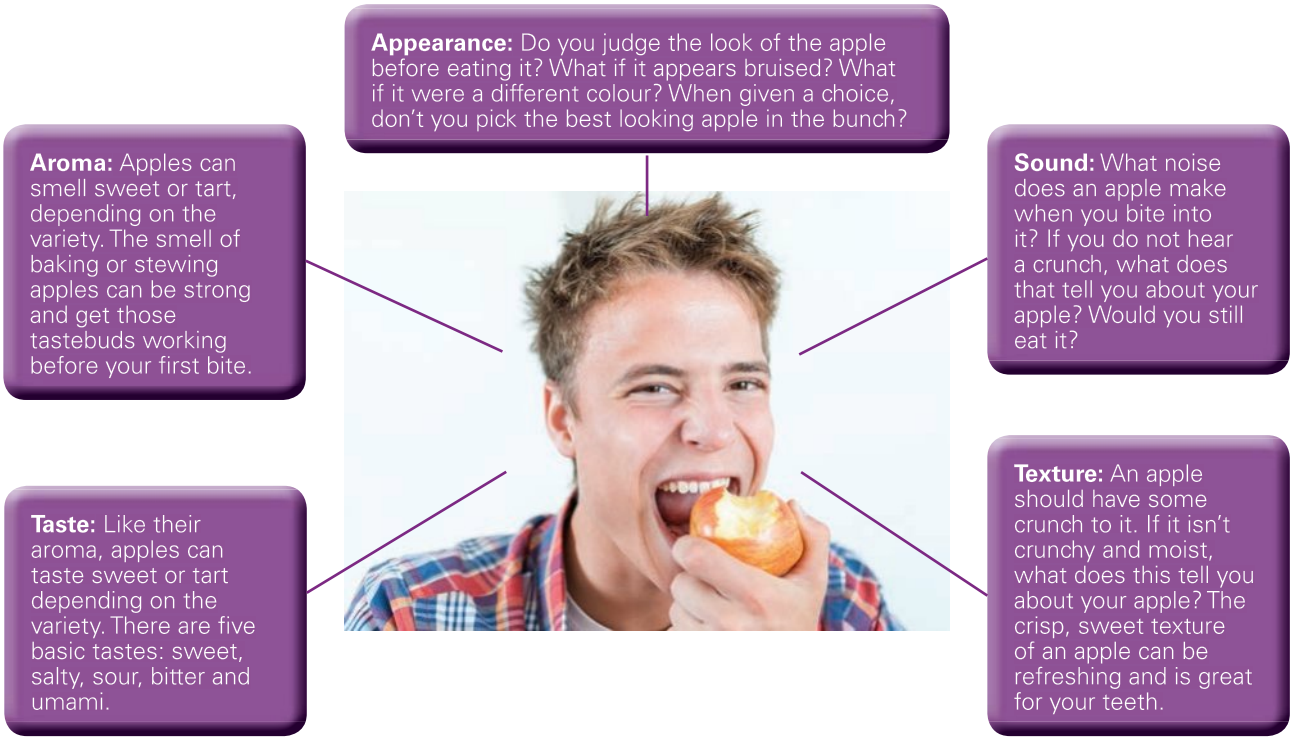

Figure 0.18 Our senses in action

Figure 0.19 Sensory terms word bank

Appearance	Aroma	Texture	Taste
burnt	acidic	brittle	bitter
clear	aromatic	chewy	bland
cloudy	bland	creamy	burnt
crisp	burnt	crisp	creamy
crumbly	citrus	crumbly	fatty
dark	fishy	crunchy	hot
dull	fragrant	dry	mild
firm	fruity	fatty	rich
flaky	mild	flaky	salty
flat	rotten	hard	sour
glossy	smoky	lumpy	spicy
golden	spicy	moist	strong
hard	strong	runny	sweet
light	sweet	rough	tart
lumpy	weak	smooth	weak
mushy	yeasty	soft	
pale		sticky	
translucent		tender	
uneven			
under-cooked			

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CHAPTER 1

Working safely and responsibly

ACCESS PRIOR KNOWLEDGE

1. Explain why it is so important to observe personal hygiene practices when preparing food.
2. Go to the tap and wash your hands. Observe and analyse this personal hygiene practice. Do you think that this is a good practice? Explain the reason for your answer. List the areas of improvement that are required.
3. Food needs to be safe to eat. Discuss what this means. Provide an example of a safe food.
4. Summarise the hygiene practices that are needed to prevent the cross-contamination of foods.
5. Identify the conditions that **bacteria** need to grow in food.

bacteria Single-celled micro-organisms responsible for decay, fermentation and ultimately spoilage of food.

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1.1 Kitchen safety is important!

Accidents are common in the kitchen, but they can be avoided if we follow a few simple safety practices and take into consideration a number of safety design features. It is when we choose not to follow these safety practices and standards that accidents will occur. It does not matter how busy we are in the kitchen or how much fun we are having, it is essential to remember to follow food safety practices at all times. Kitchen safety really is vital!

We must always remember to analyse and assess:

- kitchen design and organisation
- how we can ensure electrical safety
- how we can ensure microwave safety
- our food safety and hygiene practices
- how we can prevent burns and scalds
- the best way to prevent falls and cuts.

Food safety

We know that the kitchen is a common site of accidents and injuries. It is also one of the places where food can become spoiled and **contaminated**, and this can result in illness to ourselves or our customer or client – the person for whom we are making the food. Paying attention to a number of important kitchen and personal hygiene safety rules or practices can help to prevent this from happening.

contaminated Unsafe to eat due to contact with chemicals, foreign objects or bacteria that are harmful for people to eat.

1.1 ACTIVITY

Kitchen injuries

1. Consider the tasty trivia on page 16. Develop a list of two pieces of kitchen equipment that are safety concerns for young children. Suggest the type of injury that could occur with each of these pieces of equipment.
2. Explain why the kitchen is more likely to be a place of injury for children than any other room in the house.
3. Develop a list of five safety rules or practices that could be put into place in your home to prevent injury if a small child were to be living there or visiting.

Figure 1.1 In the kitchen, you always have to be aware of situations that could create potential safety risks.

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Tasty Trivia

The kitchen is one of the most common sites for injuries to children.
More children get hurt in the kitchen than in any other room in the house.

1.2 LET'S COLLABORATE

1 Work in groups to develop a list of the tools and equipment in your school kitchen that could be a safety risk. Explain why you think these are potential safety risks. Compare your answers with those of another group and see whether you can add to your list.

2 Work as a group to write a letter to your principal explaining your safety concerns. In your letter, discuss the reasons why these are safety concerns, possible injuries that could occur and the steps that need to be taken to reduce or eliminate the risk. Present your letter to the principal for their consideration.

Electrical safety

electricity The flow of electric power or charge.

Electricity is the flow of electric power or charge. If not used correctly, this power or charge can cause extensive injury or even death. Electricity is an invisible form of energy that is extremely important in the kitchen.

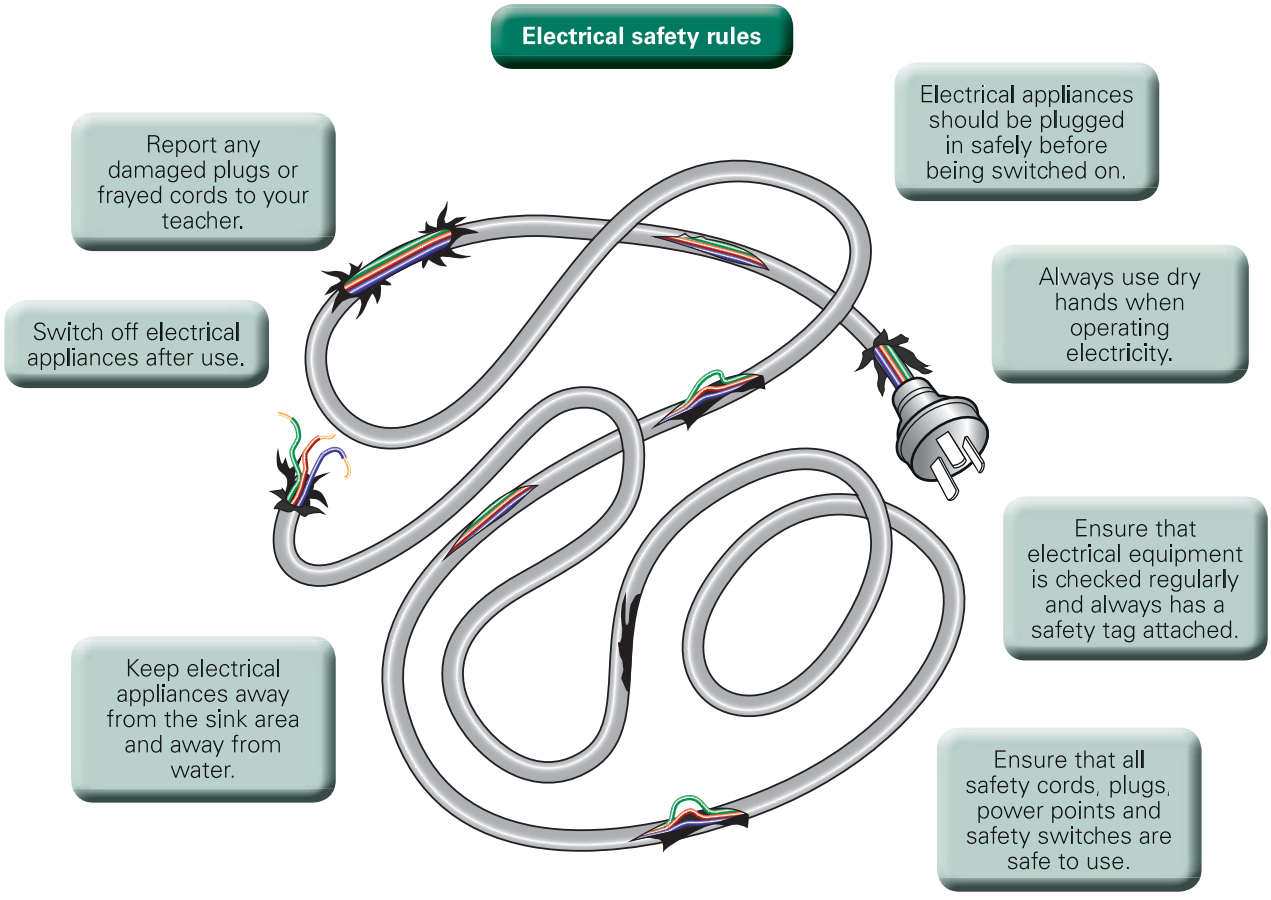

Figure 1.2 Electrical safety rules

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1.3 ACTIVITY

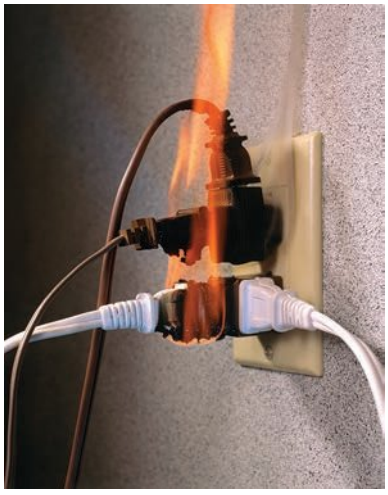
Testing and tagging

Investigate the reason why electrical equipment in your school has been 'tested and tagged'. Find out how often this 'test and tag' process needs to occur. List the equipment in your kitchen at school that *does not* have the 'test and tag' sticker attached.

Figure 1.3 Electrical equipment should be 'tested and tagged' for safety purposes.

Tasty Trivia

In Australia, more than half of the 11 000 annual fires in residential properties start in the kitchen. Most of these fires are caused by faulty or damaged electrical wiring.



1.4 LET'S COLLABORATE

Together, develop a list of appliances in the kitchen that need electricity to make them work. Discuss what will happen when there is a power outage in your area – how might you prepare meals?

CREATE A SOLUTION

There are several bananas in the kitchen that are ripe and ready to eat.

1 Create solutions to ensure healthy eating:
   - **a** Using a piece of electrical equipment safely, develop a nutritious drink using these bananas.
   - **b** Investigate two possible design solutions.
   - **c** Find two recipes that could be used to make the nutritious drink.
   - **d** Choose one of these recipes and explain the reason for your decision.

2 Produce the drink and then evaluate it, considering the following:
   - **a** Taste test your designed solution for the bananas. Evaluate how successful you were at creating a solution to the 'banana issue'.
   - **b** Develop two improvements that you could make if you were to complete this task again.
   - **c** Consider the process that you followed. Evaluate yourself. Did you practise safety precautions when using the electrical appliance? How could you make improvements to the processes that you followed?

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Basic brownies

USA

RECIPE

Main tools and equipment

Oven, heat-proof bowl, spoons, measuring cups, lamington baking tray, palette knife, scales

Production skills

Simmering, stirring, beating

Cooking processes

Baking

MAKES 12 BROWNIES

Cooking time: 15–20 minutes

Preparation time: 30 minutes

Serving and presentation time: 2 minutes

Total time: 52 minutes

Ingredients

 Cooking spray	 Baking paper	 70 g butter	65 g dark chocolate
 2 eggs	 ¾ cups caster sugar	 ½ teaspoon vanilla essence	
 ¾ cup plain flour	 1 tablespoon cocoa powder	 Icing sugar to dust	

Method

1. Preheat the oven to 180°C.
2. Lightly grease lamington tray using cooking spray, then line base of tray with baking paper.
3. Place butter and chocolate in a heatproof bowl over top of saucepan of simmering water. Stir until melted; avoid getting water or steam in the bowl. Remove from heat and cool.

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4 In a large bowl, stir eggs, caster sugar and vanilla essence together until well combined.

5 Stir in chocolate mixture. Add flour and cocoa, and stir until combined.

6 Pour into prepared tray. Bake for 15–20 minutes. Brownies will rise slightly and be just firm to touch.

7 Leave to cool in tray while doing your dishes.

8 When cool, lift out and cut into squares, dust with icing sugar and serve.

Microwave safety

Microwave ovens play an important role in food preparation. Special care must be taken when using this piece of electrical equipment to avoid injury and accidents from occurring. It is important to think about cooking times, tools and equipment used and standover cooking time.

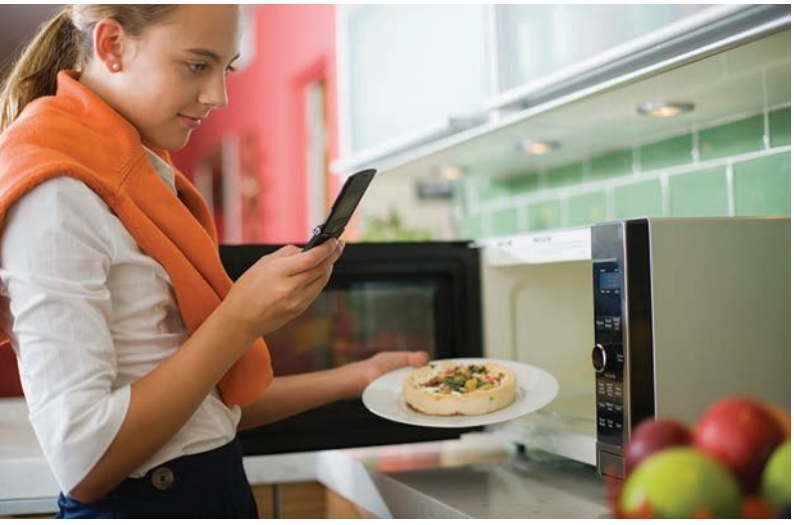

Figure 1.4 Microwaves can be a safety hazard – always pay attention!

1.2 When kitchen safety goes wrong

Preventing burns and scalds

Burns and **scalds** occur often in the kitchen. They generally happen if we are in a hurry or are being careless about following safety rules. A burn is damage caused to skin by something hot, like a saucepan; or electricity, such as when you get an electric shock; or from direct contact with fire, matches, an oven element or an oven tray. A scald is a burn caused by hot water, steam or another liquid, like the steam from a kettle or when you lift the lid of a boiling saucepan.

scald Burn from hot liquid or steam.

Figure 1.5 Be sure to remove lids so that steam rises away from you. Always use an oven mitt or potholder. Wet tea towels should be avoided.

First aid for burns and scalds

Immediate first aid will reduce the severity of a burn. Be sure to follow the steps below if someone in the kitchen is burned:

- Apply lots of cold running tap water (no ice or iced water) to the burn for at least 20 to 30 minutes. Make sure you notify your teacher! Get a fellow student to go and get your school nurse or first aid officer.
- Remove wet clothing (but only if the skin is not blistered or stuck to the clothing).
- If possible, remove anything tight such as jewellery. Burns cause swelling and this may stop circulation.
- Cover the injury with a clean sheet, non-fluffy towel or tea towel.
- If the burn is severe, keep the person who has burned themselves calm and dial triple zero (000) to call an ambulance.

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Figure 1.6 A serious burn.

Figure 1.7 How well the skin will heal depends on the severity of the burn.

Burns are serious if they involve the face, hands or feet, or if the burn area is larger than a 20 cent coin.

When someone is burned, you should NEVER:

- use butter, oils or ointments to cover the burn, as they may retain the heat
- use ice, as it can damage the skin.

Burns and scalds are really painful, as the skin shrivels and the heat goes right inside the skin. Sometimes the skin is so badly damaged that it never really heals.

1.5 INVESTIGATE IT

1 Explore the Kidsafe website or the Kids Health website (not an Australian site) to learn more information about safety in the kitchen.

2 Design a poster for your kitchen explaining the importance of safety.

Preventing falls, slips and cuts

To prevent falls, slips and cuts, be sure to do the following:

- Always concentrate – falls and cuts are often the result of a lack of concentration.
- Clean up any spills or broken glass immediately.
- Clean floors regularly to ensure that they are not greasy.
- Put appliances, tools and equipment away in the correct place.
- Wear footwear that is hard soled and covers your whole foot.
- Use knives in a safe and correct manner.
- Keep oven doors shut.
- Ensure rubbish is stored in the correct place.
- Follow correct lifting procedures and get help if something is too heavy.
- Look where you are going when moving around the kitchen.
- Never run!

Other steps to prevent injuries:

- Empty rubbish bins regularly and wash hands afterwards.
- Keep walkways and aisles clear of boxes and other clutter.
- Ensure you can see where you are going when carrying large items.
- Avoid standing in front of swinging doors and doorways.

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1.6 INVESTIGATE IT

1 Visit the Worksafe website to investigate the importance of safety in the hospitality industry for young people.
2 List the most common injuries and hazards for young workers in the hospitality industry.
3 Describe the legal requirements of an employer in the hospitality industry, outlining the hot-spots and solutions that must be in place to protect all workers from injury and illness.
4 Explain the reasons why young people are the focus of this information for the hospitality industry.

1.7 ACTIVITY

Safety first

Every picture tells a story. This activity requires you to be the forensic investigator and photographer. Set a scene showing at least three ways by which you can prevent falls, cuts and other injuries in the kitchen, and take a photograph with a digital camera or the camera on your phone. Once you have taken the photo, download it into a Word document and then indicate on the picture how you have prevented these three potential injuries.

Figure 1.8 The food-preparation industry pays a lot of attention to safety issues as the kitchen offers so many opportunities for accidents.

1.8 LET'S COLLABORATE

1 Describe five reasons why the correct footwear is required in the kitchen.
2 Discuss with a partner the importance of wearing appropriate footwear in the kitchen.
3 Thongs are not appropriate in the kitchen. Explain why.
4 Demonstrate to each other how you should move around the kitchen when carrying a knife. Practise this to ensure the safety of yourself and others in the kitchen.

1.9 INVESTIGATE IT

1 Using YouTube or another video source, find a video clip of a celebrity chef. Watch the video and evaluate the safety practices in the video. Explain how any 'poor' practices may result in injury to the general public. Share these with the class.
2 Construct a letter to the producer of the video outlining your findings. Express your point of view regarding whether or not the media source represents responsible safety and hygiene practices in the kitchen.

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Stuffed potato

USA

RECIPE

Main tools and equipment

Fork, microwave, spoons, measuring spoon, measuring cup, skewer

Production skills

Combining, dicing, grating, mashing

Cooking processes

Microwaving

SERVES 1

Preparation time: 10 minutes

Cooking time: 6 minutes (using the microwave)

Serving and preparation time: 4 minutes

Total time: 20 minutes

Ingredients

 1 large potato	 1 teaspoon milk	 1 teaspoon butter	 Pepper	 25 g cheese, grated
 1 tablespoon corn kernels	 ¼ cup ham, diced	 ¼ tomato, diced	¼ cup pineapple, diced (juice removed)	1 sprig parsley (garnish)

Method

1. Pierce potato all over with a fork.
2. Cook in microwave on high for 4 minutes.
3. Test potato with skewer to see whether it is soft. If still hard, cook for another 30 seconds.
4. Cut potato in half. Spoon out the inside, leaving 1 cm of flesh around the potato skin.
5. Combine milk, butter, pepper, potato flesh and cheese. Mash with a fork until smooth and creamy.
6. Now add the mash to the corn kernels, ham, tomato and pineapple. Combine.
7. Spoon mixture back into potato skins.
8. Microwave on high for 1 minute.
9. Serve with the parsley garnish.

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Evaluating

1 List two safety practices that you followed for this recipe.

2 List two hygiene practices that you followed for this recipe.

3 In your workbook, copy and complete the table below to evaluate how you performed in terms of safety and hygiene:

   a State two things that you did correctly.

   b Suggest two areas for improvement.

What did I do successfully?	Areas for improvement next time

4 If you were to prepare this recipe again, explain how your decision-making processes would be different next time.

1.10 ACTIVITY

Create a fridge magnet

Design a fridge magnet for your kitchen at home. Shape the magnet like a piece of kitchen equipment and then, on your magnet, list the safety tips that make the kitchen safe.

REFLECT ON LEARNING

1 Explain why the design of a kitchen is so important.

2 Summarise the reasons why electrical appliances should be kept away from water.

3 List the potential injuries that could occur with the use of the microwave.

4 Identify the differences between a burn and a scald.

5 Discuss the dangers that could occur from running in the kitchen.

6 Explain the importance of proper shoes in the kitchen. In your response, provide specific details about the type of shoes that should be worn.

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1.3 Handling food hygienically

Hygiene is the practice of cleanliness. It is essential that all people who handle food practise food preparation in a safe and hygienic manner in order to prevent the spread of disease to ensure that people who eat the food that they prepare do not become ill.

hygiene The practice of cleanliness in order to preserve health and prevent the spread of disease.

1.11 LET'S COLLABORATE

List the signs or symptoms of food poisoning. Have you ever had food poisoning? Explain what it was like – what signs or symptoms did you have?

Personal hygiene

It is important that we all follow good personal hygiene practices, as this helps to prevent and control the spread of harmful germs. The purpose of ensuring strict personal hygiene when cooking food is to prevent food contamination and food poisoning, as well as the spread of disease.

Hands are the main means of contaminating food and spreading food-poisoning bacteria. Cuts and sores provide an ideal place for bacterial growth. Cuts and sores should be covered with colourful waterproof dressings.

The nose, mouth and ears carry Staphylococci bacteria. Discharge from the ears, eyes and nose may also contaminate food. Food handlers must not: cough or sneeze over food; pick or scratch their nose; or taste food with their fingers. Hair constantly falls out of our heads, which can result in food being contaminated; therefore, long hair should be tied back or covered with a suitable hair net or chef's hat.

It is illegal to use tobacco in food preparation, handling and storage areas, or when delivering food.

Jewellery, including watches, can harbour dirt and bacteria; the small pieces in jewellery can also fall out into food. A person who is suffering from diarrhoea, vomiting, a food-borne infection, skin infections, sores, heavy colds, or ear or eye discharge must not work with food.

Figure 1.9 Always wear gloves to help prevent the spread of bacteria.

Tasty Trivia

The number of germs on fingertips doubles after using the toilet. Yet up to half of all men and a quarter of women fail to wash their hands after they have been to the toilet!

1.12 LET'S COLLABORATE

As a group, explain why colourful dressings or Band-Aids are so important in the kitchen.

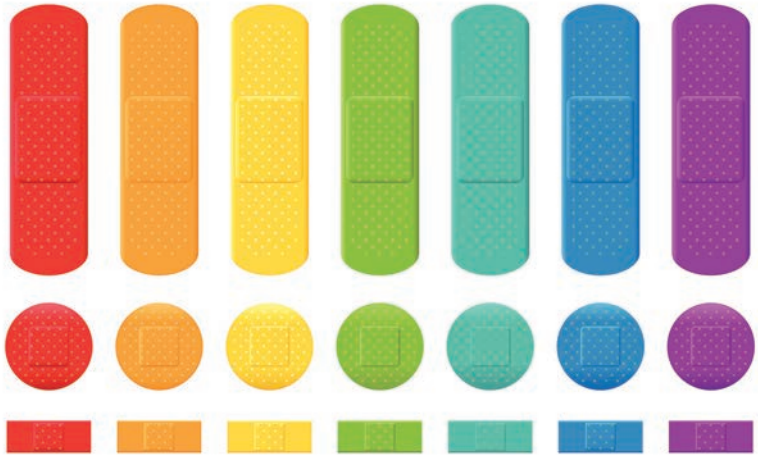

Figure 1.10 Colourful Band-Aids are a better option than flesh-coloured ones.

Tasty Trivia

A 1 mm hair follicle can harbour 50 000 germs. Humans have between 90 000 and 150 000 hairs on their heads!

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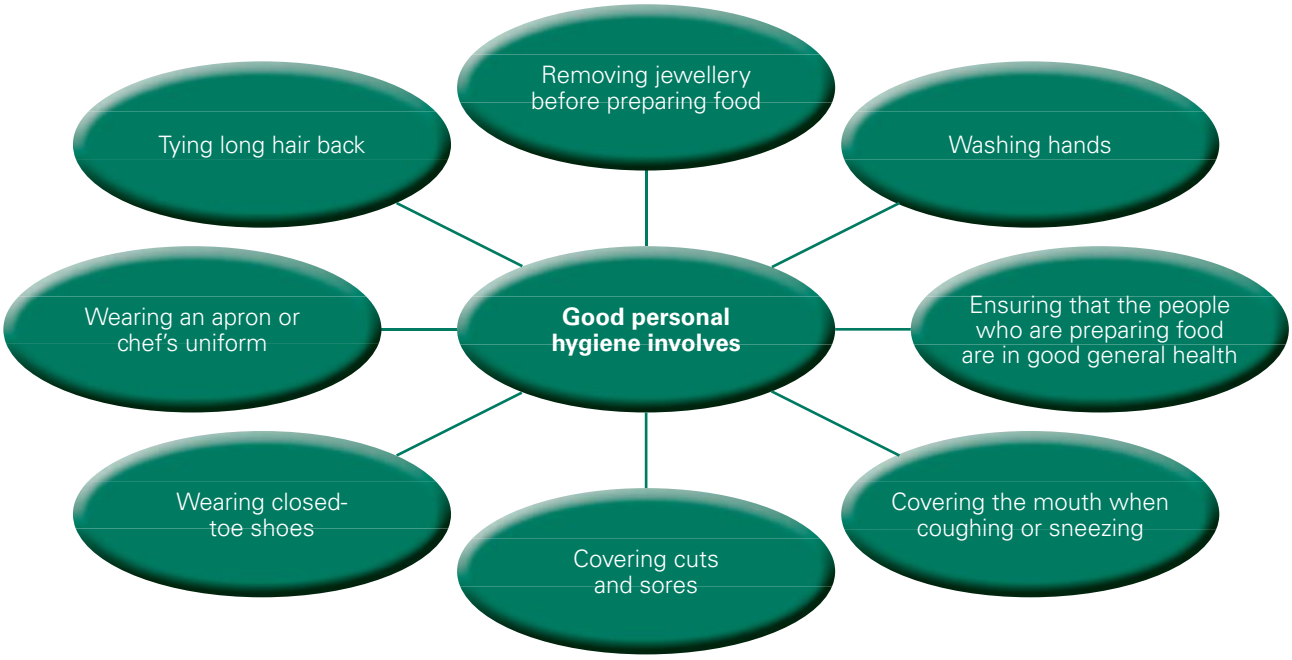

Figure 1.11 There are many ways of preventing a lack of personal hygiene from contributing to the spread of disease.

Figure 1.12 Always cover your hair when cooking.

Tasty Trivia

If you wear a ring, there could be as many germs under it as there are people in Europe. Millions of germs can also hide under watches and bracelets. This is such an important issue that there is even an area of study called Jewellery Hygiene!

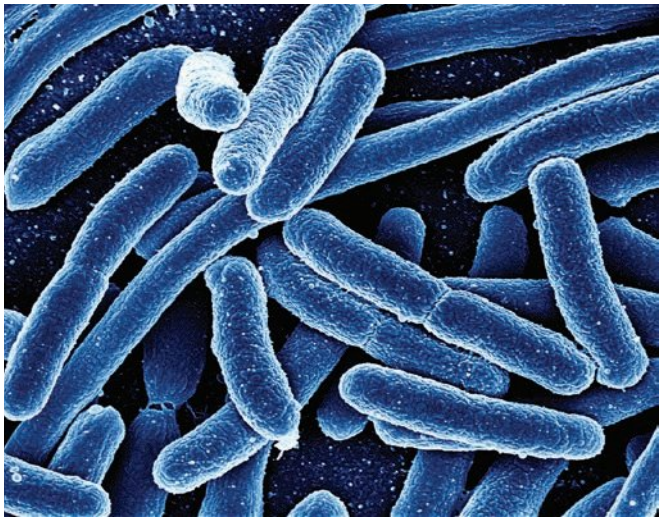

Figure 1.13 Bacteria like these E. coli can spread very quickly and cause food poisoning.

1.13 ACTIVITY

Cooking when ill

1. List the signs that a food handler would show if they were becoming ill.
2. Explain why it is so important not to allow ill people in the kitchen.
3. Predict what will happen in the home if the person who does the cooking is ill.
4. Recall the number of times you have washed your hands today. Share your response with the person beside you.

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Do you really wash your hands properly? You probably think you know how to wash your hands – it's something we have done since we were children; however, many of us don't do it properly. Simply rinsing the fingertips under cold water does not count as proper hand washing.

Follow these simple steps to ensure you wash your hands properly:

1. Use warm water. It is better to wet hands before applying soap, as this prevents irritation and helps to get the soap to lather.
2. Rub hands together vigorously, making sure both sides of the hands are washed thoroughly, around the thumbs, between each finger and around and under the nails. Don't forget your wrists as well!
3. Wash your hands for the length of time it takes to sing 'Happy Birthday'.
4. Rinse with clean, warm water.
5. Germs spread more easily if hands are wet, so dry them thoroughly – use a clean paper towel or an air dryer; it doesn't matter which.

1.14 LET'S COLLABORATE

In pairs, predict the amount of times you might expect to wash your hands in a Design and Technologies class. Compare your prediction with that of your partner.

1.15 ACTIVITY

Inspect those hands

1. Investigate your hands. Are they clean? Articulate the cleanliness of your hands.
2. Now take a magnifying glass and look at your hands. Suggest the places on your hands where germs might hide.
3. Check under your fingernails. Predict what you think is hiding underneath them.
4. List the times/occasions when you should wash your hands thoroughly.
5. Explain the reason why soap is so important in the hand-washing process.

Tasty Trivia Everything you touch can transfer germs onto your hands, including sores, pets, handkerchiefs and tissues, and everything you touch when you go to the toilet.

Figure 1.14 Follow these two steps to get rid of germs: wash and thoroughly dry your hands.

Figure 1.15 You can easily see the beetroot stains but you can't see the germs!

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Protective clothing

Protective clothing and appropriate footwear are essential in the kitchen. They not only protect our street clothing but also ensure that food does not become contaminated.

Clothing that is worn in the kitchen should be clean, lightweight and without pockets.

Aprons that are worn in the kitchen should completely cover and protect street clothing and also protect food from the risk of contamination.

Figure 1.16 Correct clothing for the kitchen.

1.16 ACTIVITY

Street clothing

Look at Figure 1.17 and answer the following questions:

1. Explain why it is unsafe to wear street clothing in the kitchen.
2. Analyse the footwear of the person in the photograph.
3. Baggy clothing and buttons that are undone can be a potential safety risk. List the reasons why this is the case.
4. Develop a list of accidents that could result from the clothing on the person in the photograph.
5. Suggest how a person should be dressed when working in the kitchen. Be sure to consider clothing or dress issues from head to toe.

Figure 1.17 Street clothing is not appropriate in the kitchen.

6. Think further than the school or home kitchen. Generate a list of other special uniforms that might be necessary in areas where food is prepared and served. Consider the following:
   - **a** restaurant manager
   - **b** waiter/waitress
   - **c** chef
   - **d** kitchen assistant
   - **e** sandwich maker in a sandwich shop.

REFLECT ON LEARNING

1. Explain the meaning of the term 'hygiene'.
2. Explain why being hygienic in the kitchen is so important.
3. List three practices that should be followed to ensure good personal hygiene.
4. Complete this sentence: 'Hands are carriers of germs because …'
5. Complete this sentence: 'Protective clothing is important because …'

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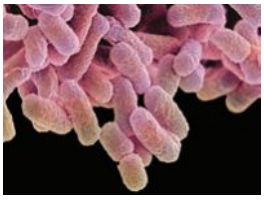
1.4 Food safety

Food safety is about ensuring that the food we consume is safe for consumption and does not put us at risk of food poisoning. Food safety regulations in Australia help to ensure that food is safe until the time it reaches us in the kitchen – whether that is the school kitchen or the kitchen at home. Once the food is with us in the kitchen, it is up to us to ensure that it is stored and prepared in a safe manner.

Tasty Trivia

Each year, there are an estimated 5.4 million cases of food poisoning in Australia – that is one in four people. Most of these cases are caused by bacteria.



1.17 ACTIVITY

The Pork Pie Shop Pies

The Pork Pie Shop has recalled their own branded Pork Pies and Ascot Pies from butchers and small grocery stores in South Australia due to potential salmonella contamination.

Food products contaminated with salmonella may cause illness if consumed and any consumers concerned about their health should seek medical advice.

The products can be returned to the place of purchase for a full refund.

Date notified to FSANZ

21/03/2017

Food type

Pork Pie

Product name

The Pork Pie Shop Pork Pies

The Pork Pie Shop Ascot Pies

Package description and size

These are unpackaged pork pies

Date marking

All batches are being recalled

Country of origin

Australia

Reason for recall

Potential microbial contamination – salmonella

Distribution

Butchers and small grocery stores in South Australia

Consumer advice

Food products contaminated with salmonella may cause illness if consumed and any consumers concerned about their health should seek medical advice.

The products can be returned to the place of purchase for a full refund.

Contact

The Pork Pie Shop

www.theporkpieshop.com.au

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1.17 ACTIVITY continued

The South Australian government has enacted a food recall on the Pork Pie Shop pies.

1. Read the information in the product recall and decide why the South Australian government forced the recall of this food product.
2. Explain the likely health implications for consumers if they were to consume this product.
3. Discuss the reason why all governments of Australia must put in place measures to recall foods when required and therefore protect the health and safety of Australians.
4. Choose a food product that you either have in your lunchbox or in the pantry in your school kitchen and develop your own product recall. Graphically represent this food recall on an A4 sheet.
5. Include the headings used in the food recall above that could be placed on the noticeboard in a supermarket to warn consumers of a product recall.

1.18 LET'S COLLABORATE

With your classmates, make a list of all the places that a piece of meat would go to before it comes to us served on a plate in a restaurant – think 'paddock to plate'. Then consider all the people who handle this piece of meat before it is served to us. Develop a list of ways that you could create a managed environment for meat so that it is safe to eat when it arrives on your plate.

1.19 INVESTIGATE IT

1. Check out the Australia New Zealand Food Standards Code website. Explain why the Food Standards Code is so important.
2. Construct a computer-generated flow chart to show both the places and people that come into contact with a piece of meat before we eat it.

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Cross-contamination

Cross-contamination occurs when bacteria and **viruses** are transferred from a surface that is contaminated to a surface that is not contaminated.

viruses Microscopic parasites that are food or water borne. They cause viral infections that result in illness in humans.

These bacteria and viruses can be transferred to and from humans, kitchen equipment, work surfaces and other foods. Cross-contamination can be prevented by the careful handling of food. Everyone who handles food, from the farmer to the butcher to the chef, must ensure that they follow good hygiene practices to avoid cross-contamination.

Always keep your chopping boards clean to prevent cross-contamination. Chopping boards should be washed carefully with hot water and detergent, then rinsed and thoroughly dried before being used for ready-to-eat products.

Figure 1.18 Hands are among the most obvious surfaces for the transfer of bacteria from raw to ready-to-eat foods.

1.20 ACTIVITY

Check out the fridge

1. Look at the fridge in Figure 1.19 and list the ready-to-eat foods that should be stored on the top shelves and the raw foods that should be stored on the bottom shelves.
2. Design a set of simple instructions about how to store food items in the fridge. Prepare the list using your ICT skills so that it could be included in the instruction manual of every new fridge sold in Australia.

Top shelf: Ready-to-eat items should be placed on the top shelves. Where possible, these items should be covered to further protect them.

Bottom shelf: Raw foods should be placed on the bottom shelves of the fridge; this prevents the raw meat juices from dripping onto cooked foods, fruits and other ready-to-eat foods. Where possible, these items should be covered to prevent cross-contamination.

Figure 1.19 Storing your food correctly will help prevent cross-contamination.

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Figure 1.20 How can the use of coloured chopping boards help to prevent cross-contamination?

Figure 1.21 Dirty cooking equipment can also contaminate foods.

The danger zone

The danger zone is the temperature at which bacteria multiply rapidly. Foods that could give you food poisoning should be kept below 5°C if they are to be served cold or above 60°C if they are to be served hot.

1.21 INVESTIGATE IT

1. Locate the state government health information website for the state in which you live. Explore the site to learn more about food poisoning and food safety.
2. Conduct a search of the federal Department of Health website to find out more about the responsibilities of our state and federal governments in ensuring that the food we eat is safe.

Figure 1.22 Cold food should be kept cold.

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The temperature danger zone is between 5°C and 60°C; it is within this temperature range that bacteria can grow to unsafe levels. Low temperatures (below 5°C) prevent food poisoning bacteria from multiplying to dangerous levels and high temperatures (above 60°C) will kill most bacteria and viruses. There are a number of high-risk foods that could potentially be hazardous if not cooked and stored properly.

1.22 LET'S COLLABORATE

As a class, do the maths! If one bacterium can multiply to become 17 million in eight hours, how many bacteria could develop in a ham sandwich that sits in your bag from 8 am until 12.30 pm when you eat it for lunch?

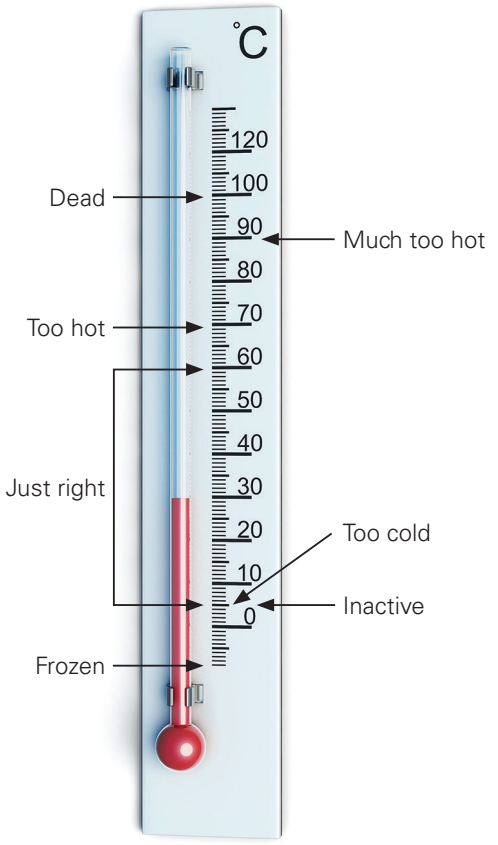

Figure 1.23 This thermometer shows how bacteria respond to different temperatures. Bacteria are happiest in the range from 5°C to 60°C – this is the danger zone for humans.

1.23 ACTIVITY

Cold or hot?

Copy and complete the table below to develop a list of foods that need to stay cold and those that need to be cooked thoroughly.

Foods that need to stay cold	Examples of foods that need to stay cold	Foods that need to be cooked thoroughly	Examples of foods that need to be cooked thoroughly
These are food items that need to stay below 5°C. These foods should be stored in the refrigerator or freezer, not just because we like them cold but because they will go off if not stored in the fridge or freezer.		These food items need to be cooked to above 60°C. This is due to the fact that the process the food item has undergone makes it easy for bacteria to get to the centre of the food (mincing, cutting) or because the flesh of the animal that we eat was contaminated with bacteria when the gut was removed.	

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Keeping food safe

Food-poisoning bacteria can grow and multiply very quickly in the right conditions. There are a few simple tips to follow when you begin work in the kitchen that can ensure the food is safe to eat and that you and your classmates do not get food poisoning. Try to remember these four rules:

1 Clean

- Clean hands – this will decrease the possibility of food poisoning happening. Remember to wash and dry your hands thoroughly for the length of time it takes to sing 'Happy Birthday' twice.
- Clean as you go – ensure that you clean dishes and dispose of rubbish as you go.
- Clean clothes and protective clothing are essential.
- Clean up any spills immediately.
- Clean dish cloths and tea towels should be used at all times.
- Clean equipment will make sure cross-contamination doesn't occur.

2 Chill

- Food that is meant to be cold should be kept cold.
- Chill cold foods in the fridge as soon as possible after purchase.
- Chill hot leftovers once steam has stopped being visible – don't leave them on the bench to cool completely.
- Defrost frozen foods in the fridge – not on the kitchen bench or in the sun!
- Your fridge should be kept at 4°C or lower.

3 Cook

- Cook food thoroughly to decrease the risk of food poisoning.
- Keep hot foods steaming hot when holding or waiting to serve.
- Serve hot food hot!

4 Separate and store

- Separate raw and cooked foods.
- Cover all foods when storing.
- Raw foods should be on the bottom of the fridge.
- Do not put cooked meat back onto the surface where the raw meat was kept.
- Be sure to store food for the right length of time, at the right temperature and in the right place.

1.24 LET'S COLLABORATE

Choose a partner and discuss the following questions together:

1. Where is meat defrosted in your home?
2. How should meat be defrosted?
3. What can occur if meat is not defrosted correctly?

Storage of food	Temperatures required
Storing chilled food	Below 5°C
Storing frozen food	Below –18°C
Cooking food	Above 75°C
Reheating solid food	Above 75°C
Reheating liquid food	Above 75°C
Hot holding food	Above 60°C

Figure 1.24 Storage temperatures for food.

1.25 ACTIVITY

Are your fridge and freezer safe?

Borrow a thermometer from school and measure the temperature of your fridge and freezer at home. Are they cooling and freezing foods at the correct temperature? Often when the temperature of a fridge or freezer is not cold enough, the seals need replacing. Is this the case at your house?

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Cheesy bacon rolls

LITHUANIA

RECIPE

Main tools and equipment

Oven, sieve, spoon or whisk, measuring cups, baking tray, measuring jug, grater

Production skills

Sifting, stirring, kneading, grating

Cooking processes

Baking

SERVES 6

Cooking time: 15 minutes

Preparation time: 30 minutes

Serving and presentation time: 3 minutes

Total time: 48 minutes

Ingredients

 Cooking spray	 2½ cups self raising flour	 60 g butter
 ¾ cup low-fat milk	 ⅓ cup low-fat tasty cheese, grated	 ¼ cup diced bacon pieces

Method

1. Preheat the oven to 200°C.
2. Lightly grease an oven tray using cooking spray.
3. Sift flour into a large bowl and add butter.
4. Using fingertips, rub the butter into the flour until the mixture looks like breadcrumbs.
5. Make a well in the centre and pour the milk into it.
6. Stir until mixture forms a soft dough.
7. Sprinkle some flour onto the bench and knead the dough gently.
8. Divide dough into 6 pieces and roll each piece into a ball. Get creative with your rolls: create a plait roll, a shell roll.
9. Use a knife to gently mark a cross on the top of each ball.

10. Spread even amounts of cheese and bacon pieces on top of each roll.
11. Place onto tray and bake for 15 minutes or until rolls sound hollow when tapped.

ISBN 978-1-316-64912-1

REFLECT ON LEARNING

1. Explain how to keep food safe.
2. Discuss three ways that cross-contamination can occur.
3. Compare bacteria and viruses. Describe the similarities and differences.
4. Complete the sentence: 'The danger zone is …'
5. List four safe food tips.

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LOOKING BACK

1 Accidents and injury can be avoided by following the safety rules.

2 The organisation and design of a kitchen are important for ensuring that the people who work there remain safe from falls, cuts, burns, scalds and other possible kitchen injuries.

3 A number of health and safety issues need to be considered when preparing food, whether it be in the school kitchen, at home, in a restaurant or in a shop.

4 It is extremely important to maintain personal hygiene standards when preparing food.

5 Food hygiene safety prevents illness and ensures that the food we eat has been stored correctly and at the right temperature.

TEST YOUR KNOWLEDGE

Multiple choice

1 When treating a burn or scald, it is important to use:

a ice

b iced water

c butter and rub it onto the burn or scald

d cold water.

2 A person can suffer from food poisoning when the food handler:

a has been ill

b has been smoking in the kitchen

c has worn jewellery and watches

d all of the above.

True/false

1 The electrical outlets are best positioned close to the sink.

2 Food cooked in the microwave can reach scalding temperatures and should be treated as a safety risk.

3 When you are in a hurry, it is all right to run in the kitchen.

Short answer

1 Explain the reason why it is so important to wash hands properly and wear protective clothing in the kitchen.

2 Explain how the 'rule' of clean, chill, cook, separate and store could be followed in the kitchen of a local pizza café.

3 Callum and Hudson are two university students who share a flat. When they have leftovers, they leave them on the bench overnight to cool. Describe to Callum and Hudson why this is a food-hygiene issue (mention temperature in your response).

Extended response

Part A

1 Analyse the safety and hygiene practices of a group of contestants on a TV food competition. Ask yourself whether you would eat their food. If you were working on this show, how would you advise the contestants to improve their safety and hygiene practices?

2 Choose one of the celebrity chefs featured on TV and complete the following analysis of their personal and food hygiene standards and also their work practices. Copy the table on the next page and complete an analysis of the pluses, minuses and interesting things (PMI) of the TV chef you have chosen.

Name of program:

_____

Name of chef:

_____

TV channel:

_____

Time featured:

_____

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What are some of the positive hygiene and work practices of your TV chef?	What are some of the negative hygiene and work practices of your TV chef?	What other interesting observations did you make while watching your TV chef?

3 While you are watching your TV chef, look for some of the following things:

- food safety practices: different chopping boards, cleaning methods, removal of waste
- organisation of the kitchen: placement of power points, space to move around
- personal hygiene and appearance: protective clothing, hand-washing practices, hair, nails, jewellery
- correct and safe use of equipment: use of oven mitts, carrying of knives, saucepan handles.

Part B

Now that you have collected your information and analysed the work practices of your TV chef, it is time to evaluate their performance. Prepare an extended response using the following guidelines:

1 Evaluate the personal hygiene of your TV chef.

2 Discuss how they performed in terms of personal and food hygiene, reflecting on the knowledge that you have gained throughout this chapter.

3 Produce a list of 'points of advice' you would give your TV chef if you were a health inspector visiting their kitchen.

4 Produce a comment or evaluate your overall impression of the food-safety practices of your TV chef.

5 Justify whether you think the kitchen organisation or design promotes safety.

6 Describe the changes that you would make to this kitchen and justify each change.

7 Discuss why you think it is important to correctly select and use kitchen equipment safely. What could go wrong with the selection and use of equipment?

8 Evaluate how your TV chef performed in terms of selection and use of kitchen equipment.

9 After viewing your TV chef, discuss how realistic the preparation of recipes is on TV.

10 Compare and contrast the production of recipes on TV with the way it occurs at school.

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CHAPTER 2

Let's get cooking

ACCESS PRIOR KNOWLEDGE

1. List and detail the sections of a recipe.
2. Suggest three different types of other useful information found in a recipe. Explain why this information is useful.
3. In food preparation, cutting is often the first task. Identify the best piece of equipment for cutting a tomato – a paring knife, a cook's knife or a serrated knife. State what task or process you would complete with the other knives that you did not choose.
4. Describe how you can ensure you have accurate measurements when making a cake. Demonstrate this to a partner.
5. Identify and explain two cooking methods that are completed when using the oven or stove top. Name one food item that you could cook using these methods.
6. List the best types of materials for bowls when you are cooking or heating in a microwave. State two food items that you could cook or heat in the microwave.

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2.1 The first steps in food preparation

Cooking food is a science, and understanding the way food behaves when you prepare, stir, **bake**, freeze or process it in other ways will help you not only to enjoy and have success in food preparation, but also to be able to make changes to suit different **design plans** and **resource** options.

We eat food every day. However, often we do not think about what we are eating, how it has been prepared and where it has come from.

bake To cook in an oven with currents of hot air surrounding the food.

design plan The plan you will follow to make the food product.

resource Something you use to achieve what you want to do. For example, in food preparation this could be money, time, available food and your skills.

2.1 LET'S COLLABORATE

In pairs, develop a list of the foods that you have eaten today. Place a tick next to the foods that you had to prepare. Place a cross next to the foods that required no preparation at all. Circle the foods that involved a preparation process at home, in a factory or in the canteen. Compare your answers with those of your partner.

In the preparation of a lot of the food you consume, a series of steps or processes has been followed to achieve a consistent result. Most of the food you eat must first be cut up and perhaps have other ingredients added and cooked before it is eaten. All these processes use many different types of tools and equipment.

Figure 2.1 Ready-made food is designed to make your life easier, but you still have to read the instructions in order to get the best results.

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Reading a recipe

Recipe books have been around since the fourth century, although it is only much more recently that the quantities of food ingredients began to be included. Processed food such as instant noodles will have a recipe or a set of instructions printed on the packet. These directions may be simple or require more knowledge to achieve a successful final product.

The preparation of a lot of the food you consume would have followed a series of steps involving carefully calculated and measured amounts of different foods to give the best results.

key foods The main food groups – cereals; fruits and vegetables; meat, poultry and seafood; nuts and legumes; dairy and dairy products, eggs; fats and oils.

There are many different **key foods** and ingredients, and a wide variety of cooking and preparation techniques. Each key food has a distinct set of **sensory**, **physical** and **chemical properties**. These properties of food change when they are prepared or cooked. The ways in which a food changes when prepared or processed will depend on the **functional properties** of ingredients.

A recipe is an excellent example of *procedural or instructional text*. It provides an aim or goal, materials to be used and the steps that need to be taken to complete the process. Steps contain verbs setting out the action and text words about how, when, where and for how long.

sensory properties The characteristics or properties of food that are detected by the five senses: smell, touch, taste, hearing and sight.

physical properties The individual characteristics of food, such as size, shape and colour.

chemical properties Include all natural chemical parts of food, such as nutrients, acids, alkalis and enzymes; in processed food, they include additives.

functional properties What the ingredients of food actually do when the food is prepared and/or cooked – for example, an egg will set when it is heated, so this makes it useful to thicken sauces.

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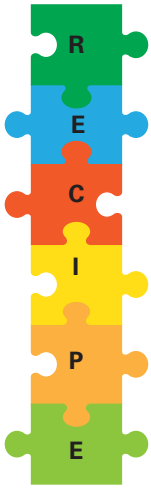
Laksa

SERVES 2

Method

Heat a little oil in a frying pan over medium heat. Add 2 tablespoons of laksa paste and cook until fragrant. Pour in 1 cup of coconut milk and 1¼ cups of water. Simmer for 2 minutes. Add 100 g vermicelli noodles, 8 sliced green beans, 8 snow peas and ½ carrot, sliced thinly. Simmer on low for 5 minutes. Ladle laksa into two bowls to serve and garnish with one spring onion sliced diagonally, a handful of bean sprouts, fresh coriander and Vietnamese mint.



eproducible, you can reproduce it at home

asily prepared

oncise, clear instructions

nteresting – results in satisfactory products, consistent with image or description

leasing to the senses

conomically viable

Figure 2.2 A good recipe is written in procedural text and has all these features.

2.2 LET'S COLLABORATE

1 In pairs, compare the laksa recipe above with the Fruit in a Cone recipe on p.42. Select three features of a good recipe and discuss whether each recipe meets these requirements. Use examples from the recipes to justify your decisions.

2 The laksa recipe is not presented in a user-friendly way; nor is it written in the correct format. Rewrite the recipe, ensuring you include each of the sections found in a recipe.

2.3 ACTIVITY

A cultural experience

Laksa is a Malaysian recipe.

1 Name a piece of equipment that would be used in the process of producing this recipe.

2 When eating laksa, an Asian soup spoon and chopsticks are used. Practise eating your laksa with chopsticks.

3 Investigate two other traditional Malaysian dishes. When looking for these recipes, think about why someone allergic to nuts must be extremely carefully when eating this culture's cuisine.

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RECIPE

Fruit in a cone

recipe title

tools and equipment needed

Main tools and equipment

Chopping board, knife, mixing bowl, wooden spoon, measuring spoons

Production skills

Slicing, dicing

making skills used

Cooking processes

Toasting

cooking methods used

SERVES 1

number of servings or quantity made

Preparation time: 20 minutes

cooking time

Serving and presentation time: 5 minutes

Total time: 25 minutes

Ingredients

list of ingredients and quantities required

 ¼ kiwi fruit	 6 raspberries	 6 blackberries	 6 blueberries
 2 tablespoons berry yoghurt	 1 waffle cone	 1 teaspoon slivered almonds	

Method

step-by-step instructions

1. Collect and prepare the fruit.
2. Combine the fruit and yoghurt if this is how you are going to present your summer treat.
3. Spoon the fruit and yoghurt into a waffle ice-cream cone.
4. Place slivered almonds in a frying pan over a low heat. Stir with a wooden spoon until they turn a light golden-brown. Keep a close eye on them at all times, taking care not to let them burn.
5. Sprinkle fruit mixture with almonds. Serve immediately.

method of pre-preparation of ingredients

method

serving and preparation

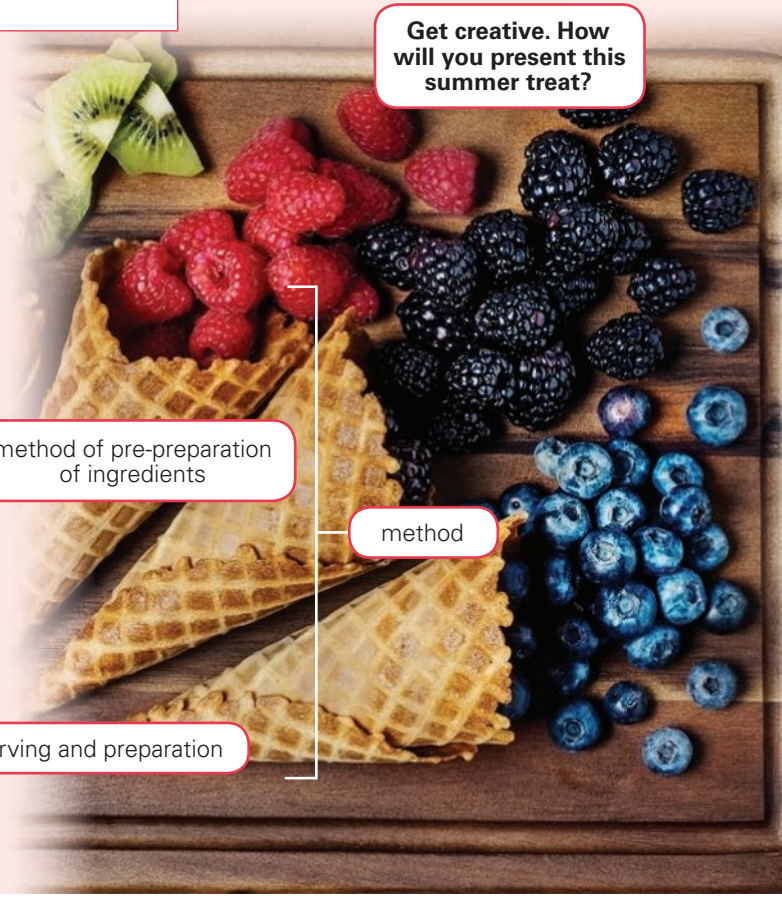

Figure 2.3 A recipe contains several parts to help it to achieve its outcome.

ISBN 978-1-316-64912-1

Each recipe tells a different story

What do the different parts of a recipe tell you?

Recipe title

Gives you a clue as to what the end product will be.

2.4 LET'S COLLABORATE

'Banana flower salad': Explain what you think the end food product might look like if this were the recipe title.

Ingredients list

This is a list of the food items or ingredients required to make this food item and the amount or quantity of each ingredient. In some recipes, the preparation technique for each food item is included in the ingredients list. For example, '½ onion, diced'. As you become more experienced, the food items can be varied to suit different tastes, likes, dislikes, health requirements (low fat, low salt) or allergies (no nuts). Varying a recipe often requires knowledge of the science of food.

2.5 ACTIVITY

Ingredients

1. Identify the recipe you might be preparing with these ingredients:
   - 250 g chicken thigh, diced
   - ¼ teaspoon cumin
   - ¼ teaspoon chilli powder
   - ¼ teaspoon paprika
   - 50 ml yoghurt
2. Be creative and list five other ingredients that could be included in this recipe.
3. Prepare the recipe and serve it on a bed of rice.
4. Conduct a sensory analysis – comment on the taste, texture, appearance and aroma.
5. Explain the aroma as you were cooking off the spice ingredients.

Method of preparation

This section gives you instructions on the processes used to prepare the ingredients, and the tools and equipment required. It also includes advice on cooking times and temperatures if the food is to be cooked. Sometimes the temperature is descriptive, such as hot, or in degrees Celsius (i.e. 200°C). The advice may also include clues to look for when an item is cooked – for example, 'fry until golden brown'.

2.6 LET'S COLLABORATE

If you were told in the method of preparation section of the recipe to steam and you did this in a bamboo steamer, what might you be making?

Other details

A recipe also includes quantities or portion serves and assembly instructions – for example, putting a pie together. Many recipes in books and magazines and on packets include a photograph to give the consumer an idea of what the food should look like when finished, and serving suggestions. Note that recipes do not always give details of the correct equipment to use, so you often have to make this decision yourself.

Be a food photographer. Prepare the Fruit in a Cone recipe on p.42. Present the food as it might be seen in a food magazine. Take a photo. Compare your photo to a photo in a food magazine. Evaluate your presentation and photography skills. Explain how you could improve these skills for future food shots.

Below is a recipe for a Greek tzatziki (yoghurt and cucumber dip). This can be served with fresh vegetables such as radish, celery or carrot sticks. It can also be used to serve with the Five Foldover (p.56) or Spicy Tortilla Triangles (p.62).

How else could you use the Tzatziki Dip on p.44? Investigate others ways in which tzatziki is used in Greek cuisine.

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Tzatziki (yoghurt and cucumber dip)

GREECE

RECIPE

Main tools and equipment

Knife, chopping board, non-slip mat, small bowl, spoon, measuring spoons

Production skills

Measuring, dicing, chopping, mixing

Ingredients

 ⅓ Lebanese cucumber, diced	 3 tablespoons (¼ cup) Greek natural yoghurt	 1 clove garlic, crushed and finely chopped
 1 teaspoon mint, chopped	 ½ teaspoon lemon juice	 Salt and pepper

SERVES 2

Preparation time: 10 minutes

Serving and presentation time: 5 minutes

Total time: 15 minutes

Method

1. Dice cucumber into 0.5 cm cubes, leaving the skin on.
2. Stir the yoghurt and garlic together.
3. Combine the yoghurt mixture with the cucumber and mint, stirring in thoroughly.
4. Add the lemon juice.
5. Season with salt and pepper to taste.
6. Cover and store in the refrigerator until ready for use.

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2.7 ACTIVITY

Breaking down the basics

Referring to the tzatziki recipe, complete the following:

1 Identify which ingredients are combined first:
   - **a** cucumber and mint
   - **b** yoghurt and garlic
   - **c** yoghurt, cucumber and mint
   - **d** lemon juice, salt and pepper.

2 List the ingredients you add to the first mixture of combined ingredients.

3 Identify which of these ingredients is not needed for this recipe:
   - **a** lemon juice
   - **b** pepper
   - **c** sugar
   - **d** cream
   - **e** salt.

4 List the preparation technique suggested for the garlic and cucumber.

5 Name the ingredients you think provide the flavour in this dish. Suggest one other ingredient that could be used to flavour this dish.

6 This recipe makes enough tzatziki to serve two people. To serve four people, you would need to do which of the following:
   - **a** halve the measurements
   - **b** double the measurements
   - **c** investigate a recipe that serves four.

7 As the recipe makes enough tzatziki to serve two people, how much yoghurt would you use to serve only one person:
   - **a** 1 tablespoon
   - **b** ½ cup
   - **c** 6 tablespoons
   - **d** 1½ tablespoons?

8 List all the terms that are instructions about processes used to prepare the food. One example is 'dice'; try to write down at least five extra terms. Provide a definition for each of these terms.

9 Explain why you think the recipe suggests the salad should be stored in the refrigerator until required.

2.2 Following an order of work

A clear sequence or order of work is necessary to produce a quality product, along with accurate use of tools and careful presentation.

Changes can be made with knowledge of ingredients and functional properties of food. In new food product development, you can work with a basic recipe and make changes to suit different requirements – for example, to increase the fruit content in a muffin or produce a low-fat muffin. Basic recipes can be adapted to make quite different products. For example, bread dough can be made into a loaf, pizza base, rolls of all sizes and shapes, and sweet bread.

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2.8 ACTIVITY

Divide and separate

Sometimes a recipe is not divided into ingredients and method sections. The ingredients and method might be included together in one recipe, as in the Chinese Fried Rice recipe below. Read the recipe, then answer the questions that follow:

Chinese fried rice

CHINA

Heat 1 teaspoon of oil in a frying pan and fry the beaten egg until it is set. Lift the cooked egg out, roll it up and slice into thin strips. Add another 3 teaspoons of oil and fry ½ diced onion until it is soft and then add 1 clove of crushed garlic and fry for 30 seconds. Add 50 g prawn meat or shrimp and stir until it is cooked. Add ¼ cup frozen peas and cook for 2 minutes. Add ½ cup of bean shoots. Cook for 1 to 2 minutes. Add 2 cups of cold cooked rice and 2 teaspoons soy sauce, stir gently and cook for one minute. Divide the mixture into 2 serves and place on warm serving plates.

1. Rewrite the recipe in a format that is more easily followed. Put the ingredients in a separate list and then logically sequence the steps in the method. Follow the sequential format from the Fruit in a Cone recipe on p.42.
2. Identify three problems you can see with the recipe, such as preparation and equipment instructions that should be provided to make it clearer. Compare your suggestions with those of other students.
3. Slicing, dicing and beating are three preparation techniques. Select one and describe the process in your own words.
4. Find out what 'garnish' means. Suggest other possible garnishes for this dish.
5. List all the equipment that is used to measure the ingredients.
6. Suggest two alternative ingredients that could be used in this recipe. Justify your choices.
7. Describe the preparation and cooking times that will be needed for these alterative ingredients.
8. Explain why a wok was chosen as the cooking equipment used to prepare this recipe.
9. Discuss the importance of using a high heat when cooking with a wok.

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REFLECT ON LEARNING

1. Explain why it is important to have a well-written and clearly presented recipe.
2. Write down three types of information that you get from an ingredients list in a recipe.
3. Describe two important types of information provided in the method section of a recipe.
4. List two other types of information that may appear in a recipe.
5. It is possible to modify a recipe. Suggest what information you would need to do this.
6. Describe a situation where you might want or need to modify a recipe.

2.3 Measuring accurately

An important aspect of preparing food and following a recipe is knowing how to measure ingredients and the correct equipment to use. In most recipes, a level of accuracy is essential for a good edible outcome. For example, when you watch a TV program on making a stir-fry, the chef appears to be randomly throwing ingredients in with a splash of sauce and a sprinkling of salt and chilli powder, but this is based on years of experience. An excess of chilli powder would make the dish inedible, as would a tablespoon of soy sauce instead of one teaspoon. Cooking is a science: correct proportions are essential for the right chemical reactions to occur.

Figure 2.4 Ensure success by measuring your ingredients using the correct equipment.

Tasty Trivia

Historically, recipes seldom listed quantities and technique was rarely mentioned. Recipe books were really only for the wealthy.

2.9 ACTIVITY

Calculating measurements

1. A recipe requires ¾ cup of flour, yet there is no ¾ cup in the set. List your options.
2. A recipe requires ⅔ cup of flour. Identify what you will use to measure it.

Using scales

Some recipes use weight measurements rather than cups, as they are often considered more accurate. Scales may be digital, balance or spring balance.

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Banana smoothie

RECIPE

Main tools and equipment

Measuring jug, measuring cup, measuring spoons, glass, blender

Production skills

Measuring, blending

Ingredients

 ¾ cup low-fat milk	 ½ cup plain yoghurt	 1 ripe banana, roughly cut
 1 tablespoon rolled oats	 1 teaspoon honey (5 ml)	 1 pinch of nutmeg

Method

1. Mix the milk, yoghurt, banana and rolled oats in a blender. Blend until smooth.
2. Add the honey and blend until combined.
3. Pour into a glass, sprinkle with nutmeg and serve.

SERVES 2

Preparation time: 10 minutes

Serving and presentation time: 5 minutes

Total time: 15 minutes

2.10 ACTIVITY

Let's measure

Make a smoothie or milkshake.

1. Measure ¾ cup milk. Calculate how many millilitres this is.
2. List what will be used to measure ½ cup yoghurt.
3. List what will be used to measure 5 ml honey.
4. Investigate other fruits you could use in this smoothie. Name five options.
5. Smoothies are seen by many as a healthy drink or food item. Thinking about the ingredients that can be added to a smoothie, explain why this might not always be the case.

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Blueberry good banana muffins

Main tools and equipment

Sieve, muffin tin, oven, fork, large bowl, large spoon, measuring spoons, measuring cups

Production skills

Mashing, sifting, mixing, folding, whisking

Cooking processes

Baking

MAKES 6–8 CUPCAKE-SIZED MUFFINS

Preparation time: 15 minutes

Cooking time: 20 minutes

Serving and presentation time: 5 minutes

Total time: 40 minutes

Ingredients

 1 cup self-raising flour	 ¼ teaspoon ground cinnamon	 ¼ cup sugar	 ½ cup frozen or fresh blueberries	 1 ripe banana, mashed
 1 egg	 2 tablespoons vegetable oil	 90 ml milk		

Method

1. Prepare cup-size muffin tin. Place cupcake cases or patty pans into a muffin tin.
2. Preheat oven to 180°C.
3. Sift the flour and cinnamon. Add the sugar.
4. Add the berries and banana and gently stir the flour mixture through the fruit.
5. In a small bowl, whisk together the egg, vegetable oil and milk.
6. Add the liquid ingredients to the flour mixture. Lightly combine. Do not over-mix.
7. Spoon the mixture into the cupcake cases, filling each case just over ⅔ full.
8. Bake for 20 minutes, or until golden brown.

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2.11 ACTIVITY

Weight vs measurement

1. The Blueberry Good Banana Muffins recipe on p.49 includes 1 cup self-raising flour. Test the weight of the flour on scales.
2. Investigate the weight of ¼ cup sugar.
3. Compare the weight of ¼ cup white granulated sugar, ¼ cup caster sugar and ¼ cup self-raising flour. Identify which is the heaviest.
4. Check your measuring accuracy. Make the muffins.

REFLECT ON LEARNING

1. Describe one rule to remember when measuring dry ingredients to make sure the measurement is accurate.
2. List what equipment you will use to measure 100 ml of milk to make sure it is an accurate measurement.
3. Suggest when weight measurements are used in food preparation.
4. Describe the different types of scales available in your school.

2.4 Using the right equipment

In many food-preparation tasks, hands are the easiest tool to use. Think of all the food-preparation tasks that are completed using your hands. Kneading dough can be done with electrical equipment, but hands will do the task just as well.

A knife is the most common preparation tool. Most of the food you eat will have been cut up first before it is further processed or cooked. A tool as simple as a knife is used to cut the food and more complex equipment like a stove is used for cooking.

To save time, many small appliances are designed to speed up the process of food preparation and cooking. For successful cooking, it is important for you to know the tools and equipment that are used, what they can do and how to use them. Correct tools and equipment will achieve better results, increase safety and reduce preparation time.

Figure 2.5 Have you seen these tools in the kitchen at home? Do you know what the purpose of each item is and how to use it?

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Knives

A good knife is made up of several different sections, each with a specific function (see Figure 2.7). Mastering basic knife skills is the single most important aspect when it comes to improving your confidence in the kitchen. A good knife is your most valuable piece of kitchen equipment. It must be treated with care and looked after to ensure that it continues to fulfil all its functions. A good knife that is well looked after should last a lifetime. Chefs and some homes have a vast selection of knives, as manufacturers design different knives for different purposes. The most common knives are the paring knife and the cook's knife. Most cooks can complete a range of tasks with just these two knives. Many homes also have a **serrated** knife for cutting bread.

serrated A serrated knife has a jagged, saw-like edge; it is usually used for bread but is also good for cutting tomatoes.

Figure 2.6 A serrated knife.

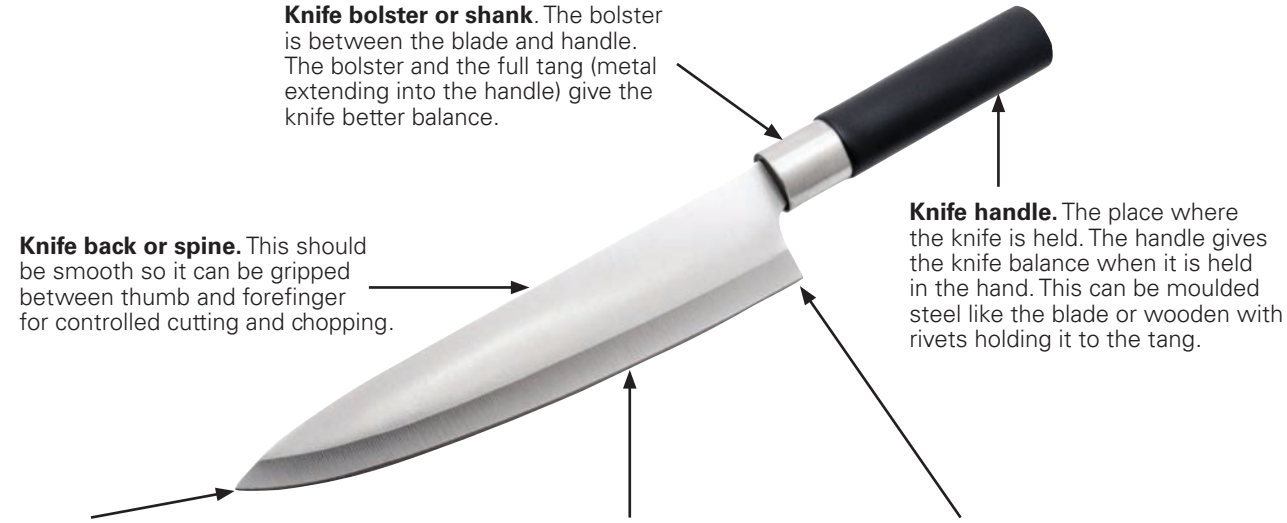

Figure 2.7 A good knife is essential.

2.12 INVESTIGATE IT

Visit the Global Knives website and compare the shape and style of knives used for filleting fish or boning meat, and slicing and dicing vegetables, under 'Range'. Draw a diagram of three different types of knives and state the reasons for their use. Care and sharpening techniques are also included. Develop a list of rules to be followed in order to care for your knives. Develop step-by-step instructions to explain how a knife should be sharpened.

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Using a knife

The following steps should be followed when using a knife to cut fruits or vegetables:

1. Hold the knife firmly by the handle with the handle resting comfortably in the palm of the hand.
2. The thumb and forefinger wrap around the knife in front of the bolster, which is referred to as the *blade grip*, or immediately behind the bolster.
3. Food should be placed on a board, held with the fingers and thumbs, with the fingertips tucked in.
4. The first step in cutting fruits or vegetables is to stabilise your cutting board. This can be done quickly and easily by placing a flat damp tea towel or rubber non-slip mat smoothly under the board.
5. Rounded vegetables should also be anchored to prevent knife slippage, which can result in injury. For example, creating a flat surface by cutting one thin slice off a rounded side of an eggplant, carrot or zucchini will stop it from rolling around on the board.

A paring knife is smaller and can be manipulated more easily. It is used for tasks such as peeling fruit and vegetables. The larger cook's knife is used for cutting larger food items. Choose the correct knife for the job and concentrate when cutting.

Carrying a knife

Never walk around carrying a knife unnecessarily. If you must do so, hold the knife by the handle and point the knife downwards with the tip pointing to the floor, with the blade facing backwards and the knife held close to the body.

Cleaning and caring for a knife

Wash and dry each knife separately, with the sharp edge pointing away from your body. Knives must never be left immersed in water or covered by food scraps.

When a knife is not in use on the bench, place it away from the edge of the bench so that it cannot be knocked onto the floor. The handle should be facing towards you for easy access.

When storing a knife in a drawer, take care to protect the tip and edges of the knife.

Figure 2.8 Take extra care when using knives. NEVER cut towards yourself.

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2.13 ACTIVITY

To peel, dice or slice?

1 Identify four fruits and four vegetables that can be:
   - **a** peeled by hand
   - **b** peeled using a peeler
   - **c** peeled by knife
   - **d** not normally peeled.

2 Justify the reason why carrots should be peeled.

3 Explain this statement: 'Zucchinis do not need to be peeled.'

4 Check your work area and list any other tools and equipment that can be used for slicing, cutting or breaking up food. For each tool or piece of equipment, state a food that is processed with it.

5 Define the term 'dice'. List 10 food items that you may be expected to dice in a Home Economics class.

6 Name one food item or meal for which each piece of equipment suggested in Question 4 would be suitable in food preparation.

Other equipment in the kitchen

A lot of other kitchen equipment is designed specifically for a particular purpose, including storing, preparing, mixing, cooking and serving. Some of this equipment is electrical and some items have more than one purpose, such as a casserole dish for cooking and serving.

Figure 2.9 Many items of restaurant kitchen equipment will never be used in a residential kitchen. Can you think of some examples?

Smaller new kitchen tools, also known as gadgets, regularly appear on the market. For example, the new fruit and vegetable slicer (see Figure 2.10) allows the creative cook many different effects for fruit and vegetables: slices, strips, noodles, curls, rings and much more. Have a go at one of these and see whether you can make zucchini 'pasta'.

Figure 2.10 The new whiz in the kitchen – a gadget that can make spiral fruit and vegetable slices.

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2.14 LET'S COLLABORATE

With a partner:

1. Divide your page into four columns and classify each piece of equipment listed below under the following headings: Preparing; Mixing; Cooking equipment; Container for cooking.
2. Write an 'E' beside the equipment if it is also available as an electrical appliance.
3. Check your work area and indicate the tools and equipment to which you have access, and mark it on the list with an 'A'.
4. Write down any other equipment that is available in the Home Economics room or at home, and that is not already on the list.
5. Investigate any equipment that is unknown and cannot be classified, and write a short summary of its uses.

Preparing	Mixing	Cooking equipment	Container for cooking.

serrated knife	chopping board	spatula	cake cooler or wire rack
griller	beater	bamboo steamer	chinois
manual	oven	barbecue	pastry brush
baking tray	peeler	skewer	saucepan
grater	colander	food processor	mandolin
whisk	kitchen scissors	stove top	tagine
paring knife	deep fryer	apple corer	rolling pin
cook's knife	mixing bowls	electric beater	mortar and pestle
sieve	frying pan	blender	juicer
gratin	baking tins	wok	rice-cooker
wooden spoon	egg slicer	non-slip mat	bamboo rolling mat

6. Investigate and compare the nutritional benefit of the following pieces of equipment:
   - **a** a wok compared with a deep fryer
   - **b** a pressure cooker compared with a frying pan.
7. Explain how you think the taste and texture of:
   - **a** a potato would alter when using a wok compared with a deep fryer
   - **b** a carrot would alter when boiled compared to when steamed.
8. Think about the impact of stir-frying vegetables compared with roasting them. Outline how the taste and texture would be different. Which of these methods is better nutritionally? Explain why this is the case.

2.15 INVESTIGATE IT

The Thermomix is an all-in-one kitchen machine, combining the functions of 10 appliances in one unit. First launched as a food processor, the Thermomix is becoming a popular appliance in both professional kitchens and homes. Visit the Thermomix website and list all of the functions that this machine can perform to save time in the kitchen.

Figure 2.11 Thermomix appliance.

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Investigation of suitable tools to use for the Five Foldover

In the preparation of the Five Foldover recipe below, test the following equipment and preparation techniques. Complete the following tasks and rate the tools suggested for the tasks. Write a conclusion about the best option. One pair of students could test each task and report back to the class.

For each of the following tasks, list the disadvantages and advantages of the suggested equipment for completing the task. Select the preferred option and justify your choice. Set up a table like the following one and list the options for the equipment to be used. Make a decision about the preferred equipment to be used and provide a brief explanation about why it is your preferred choice.

Ingredient	Option 1	Option 2	Option 3	Preferred choice and explanation
Cheese				
Cos lettuce				
Carrot	Large holes on grater	Small holes on grater		
Roma tomato				
Cucumber				

Decide on the best option for:

1 **shredding** Cos lettuce:
- vegetable or paring knife
- kitchen scissors
- food processor or serrated knife
- cook's knife

2 **slicing** Roma tomato:
- vegetable or paring knife
- food processor or serrated knife
- scissors
- cook's knife

3 cutting cheese into very small pieces:
- cook's knife
- large holes on grater
- medium holes on grater
- food processor

4 slicing bread:
- food processor
- cook's knife
- paring knife
- serrated knife.

shred To cut finely into long, thin strips; a term used for leaf vegetables – for example, to shred lettuce, cabbage or spinach leaves.

slice To cut through with a knife.

Prepare the Five Foldover recipe on p.56 using your preferred option for cutting and grating. Compare your results with those of other students and write a report on your findings.

2.16 ACTIVITY

Creating solutions for healthy eating

You are to produce a tasty healthy snack for lunch or after school suitable for summer or autumn. The snack is called a Five Foldover because it will have five ingredients and be folded inside a flatbread such as pita or a tortilla. Your Five Foldover needs to be served attractively, so think about presentation. Photograph your design solution. Practice your food photography skills if necessary.

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Five Foldover

RECIPE

Main tools and equipment

Knife or grater, chopping board, non-slip mat, measuring spoons

Production skills

Measuring, slicing

Ingredients

 1 lettuce leaf	 ¼ small carrot	 ½ tomato
 ⅓ cucumber	 30 g tasty cheese	 1 pita pocket bread
 1 teaspoon hummus	 1 tablespoon tzatziki	

Method

1. Wash and dry the vegetables.
2. Prepare the vegetables and cheese according to the technique you have selected using your chosen piece of equipment.
3. Split the pita bread and spread with hummus.
4. Arrange all the prepared ingredients in the bread, leaving a 2 cm border. Top with tzatziki.
5. Fold the bottom of the pita bread up, firmly roll from the side and wrap in plastic wrap. Store correctly if it is not to be eaten immediately.

SERVES 1

Preparation time: 10 minutes

Serving and presentation time: 5 minutes

Total time: 15 minutes

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Tasty Trivia

Ice-cream machines allow you to make your own ice-cream quickly and easily. In the early 2000s, these were one of the most popular small appliances in the home. Do you have an ice-cream machine? How often is it used in your house? Share your thoughts with the rest of the class.

REFLECT ON LEARNING

1. Explain three safety rules that apply when using a knife.
2. Describe what part of the knife needs to be used carefully, as it is easily damaged.
3. Outline how you can stop a carrot from rolling when you are cutting it.
4. List three pieces of equipment that could be used for cutting or chopping food into small pieces.
5. Explain the best method to keep your chopping board from slipping when you are cutting.
6. Name four pieces of equipment that you could put food in to cook it.

CREATE A SOLUTION

Tonight your parents have to work back late, but this is no excuse for unhealthy eating – you can cook! The only problem is that your kitchen at home is being painted and you are not allowed to go in. The resources you have are limited: you can't access the oven or the microwave. You have managed to find the electric wok, which your dad loves to use. This has been set up in the laundry. Design a healthy meal option that you can prepare for yourself and your brother for dinner using only this piece of equipment for cooking.

2.17 LET'S COLLABORATE

An electric frying pan and Thermomix are examples of small electrical appliances. List as many electrical appliances that are used in the home to prepare food as you can. Compare your list with those compiled by the rest of the class.

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Cooking

The skill in cooking does not only come from following a recipe carefully, but also from knowing how to control the amount of heat, type of heat and intensity of heat to cook a wide range of foods.

Microwave

Microwaves have become an integral part of most households. In many apartments, a traditional oven is not included in the kitchen fittings – only a stove top and a microwave. Like stoves, microwaves vary considerably in their design features, with some cooking with only waves and others including a radiation heat source as well as waves.

Tasty Trivia

Boiling a cup of water for tea is more energy-efficient in an electric kettle compared with using a microwave.

2.18 ACTIVITY

The microwave or the oven?

1. Develop a list of the advantages and disadvantages of using a microwave oven.
2. Develop a list of the advantages and disadvantages of using a conventional oven.
3. List 10 products that you might cook in the oven and 10 products that you might cook in the microwave.

2.19 INVESTIGATE IT

In tropical North Queensland, the lives of Aboriginal and Torres Strait Islander peoples have evolved around tropical forests over many thousands of years. The First Peoples of this area use seasonal foods and traditional methods of cooking to prepare the food that they hunt and gather.

1. Find out about the traditional bush tucker from tropical North Queensland:
   - **a** List as many of these traditional foods as you can.
   - **b** Discuss the role played by fish and turtle meat in the daily diet of Aboriginal and Torres Strait Islander peoples in this part of Australia.
2. Traditional methods of cooking and equipment used to cook food are very different from those we use in our homes today. Outline the role of paperbark as a piece of cooking equipment used to cook fish.

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2.20 ACTIVITY

Rice-cooking processes

Below are instructions for cooking rice in boiling water on the stove top or in a microwave. Similar instructions to these are written on the back of packets of rice.

1 Discuss the differences in the equipment used, time taken and cleaning up.

Absorption method of cooking rice Serves 2		Cooking rice in a microwave Serves 2	
Equipment Saucepan Stove top Measuring equipment Wooden spoon for stirring	**Ingredients** 1 cup long-grain rice 1½ cups water	**Equipment** Microwave-safe dish and lid Microwave Measuring equipment Wooden spoon or fork for stirring	**Ingredients** 1 cup long grain rice 2 cups boiling water
Method **1** Put the rice and water into a medium saucepan. **2** Bring to the boil, stirring occasionally. **3** Lower the heat, cover and simmer for 12–15 minutes. Check after 10 minutes to make sure the rice has not stuck to the bottom of the saucepan. **4** Remove from the heat and stand, covered, for 5–10 minutes. **5** Serve.		**Method** **1** Place the rice and water into a large microwave-safe container. Stir. **2** Microwave on high for 6 minutes. Stir. **3** Microwave on medium for 8 minutes. Stir. Replace lid and rest for 1 minute. **4** Serve. *Note*: different microwaves have different power levels. Check the microwave instruction book for time recommendations.	

2 Copy and complete the advantages/disadvantages table below to compare the two techniques for cooking rice. Write a conclusion about the preferred technique.

Cooking method	Advantages	Disadvantages
Absorption method		
Microwave method		

3 Investigate the traditional Asian method of cooking rice. How do the two methods outlined above differ?

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Cooking containers

As well as knowing about the amount and intensity of heat, you also need to know about the quality and type of cooking equipment.

Current cooking container materials include cast iron, stainless steel, toughened glass, copper, aluminium, enamelled steel and pottery. Polytetrafluoroethylene (PTFE) is used on some of these materials to create a non-stick surface.

These materials all have different cooking qualities and therefore different uses to achieve the best results (as outlined in Figure 2.13). Some also require different equipment to stir with. Non-stick cookware needs care to protect the surface, so silicone, toughened plastic or wooden spoons are best for stirring.

Tasty Trivia Early hunters would immediately have noticed the advantages of a speared animal placed over the heat while still on the spear. There would have been no ash or dirt on the meat and it could be rotated, thus enabling more even cooking.

Figure 2.12 A Luau is a traditional Hawaiian party or feast during which a whole animal – in this case, a pig is cooked. The method of cooking used here is similar to a spit roast..

conductor A good conductor of heat – for example, copper, stainless steel and enamel – allows the heat to travel through it quickly. Wood and glass are poor conductors of heat, which is why wooden spoons are best for stirring hot food.

Cast iron		Stainless steel	
	• Very heavy • Takes a long time to heat up • Holds heat well		• Thinner material, lighter weight • Good **conductor** of heat • Heats up quickly • Responds quickly to heat change
Toughened glass		**Non-stick cookware**	
	• Suitable for oven use • Poor conductor of heat • Takes time to heat up		• Non-stick surface must be protected • Only toughened plastic and wooden tools can be used on it as metal will scratch the non-stick surface • Also popular for baking trays

Figure 2.13 Select the cooking container most suited to your purpose to ensure success.

REFLECT ON LEARNING

1. Compare the way heat cooks in a griller with the way it cooks in the oven.
2. List three advantages of using a microwave when cooking.
3. List three disadvantages of using a microwave.
4. Identify a good conductor of heat.
5. Explain why a saucepan needs to be a good conductor of heat.

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2.21 ACTIVITY

What am I?

Create a 'What am I?' game or quiz for tools and equipment from other countries. This task can be completed on a computer, using the internet to download a photograph and recipe.

1. Select up to 10 tools and/or pieces of equipment that originate from other countries and are used for food preparation, processing or cooking of food.
2. You will need to research the food preparation of other countries to find out about some different tools and equipment.
3. Decide on the tools and equipment that will become the answer for the 'What am I?' clues. Remember to keep your choice a secret because you want to test other students later.
4. Create six clues, ranked from the hardest to the easiest.
5. Clearly write the clues on paper or the computer. Keep these on a separate sheet.
6. Investigate safety issues for the use of this equipment.
7. Include a recipe that uses your selected equipment.
8. Include a diagram of the tool or equipment.
9. In groups of four, try out your 'What am I?' on other students. For example:
   - First clue: Describe the material that is most frequently used to make this tool or equipment – for example, it is most often made of a heavy metal, such as steel.
   - Second clue: Describe the use of this equipment in general terms – for example, it is used for cooking food.
   - Third clue: Describe a well-known Australian equivalent – for example, in Australia we could use a frying pan.
   - Fourth clue: Describe some food ingredients that are usually associated with this tool or equipment – for example, a food often cooked in this dish contains rice.
   - Fifth clue: This clue should include the country that traditionally uses this tool or equipment in food preparation or cooking – for example, it is most often used for Chinese cooking.
   - Sixth clue: The last clue should be easy. Describe the tool or equipment – for example, it is like a large, round frying pan with high sides and is used with a flat stirrer with a long handle.

2.22 LET'S COLLABORATE

With a partner, discuss and list the materials used for saucepans, frying pans and cake tins in your work area.

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Spicy tortilla triangles

MEXICO

RECIPE

Main tools and equipment

Baking tray, pastry brush, saucepan, wooden spoon, measuring spoons, measuring cups, grater, grill

Production skills

Measuring, dicing, grating

Cooking processes

Baking, sautéing, grilling

MAKES 12 TRIANGLES

Preparation time: 10 minutes

Cooking time: 15 minutes

Serving and presentation: 5 minutes

Total time: 30 minutes

Ingredients

 2 round flour tortillas (23 cm)	 1 teaspoon olive oil	 ½ onion, finely chopped	¼ red capsicum, diced finely	1 clove garlic, crushed
 1 cup kidney beans, drained and roughly mashed	 ½ cup thick and chunky bottled salsa	 1 tablespoon coriander, chopped	¼ cup corn kernels	45 g cheddar cheese, grated

Method

1. Cut each tortilla into 8 triangular pieces.
2. Brush or lightly spray the tortilla triangles with oil. Place on a baking tray and bake in an oven at 200°C for 5 minutes or until crisp and brown.
3. For the topping, place 1 teaspoon olive oil in a saucepan.
4. Add the onion and stir over a medium heat for 2 minutes.
5. Add the garlic and stir for another 1 minute, or until the onion is tender.
6. Stir in the kidney beans, salsa, capsicum, coriander and corn. Remove from the heat and leave to cool.
7. Spread the topping on the triangles, leaving a border around the edges.
8. Sprinkle with the grated cheese. Place another tortilla triangle on top. Grill for 1 minute, or until the cheese has melted.
9. Serve. You might like to serve your tortilla with guacamole. *Note*: Spicy tortilla triangles use all parts of the stove to cook.

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LOOKING BACK

1. A recipe gives you information about the ingredients needed, processes to use and cooking techniques. It is set out with logically ordered steps to follow in order to produce food.
2. Ingredients, tools and equipment, and processes need to be managed to produce food products.
3. The best outcomes in food production are achieved with accurate measurement of ingredients by using the correct equipment and the correct measuring techniques.
4. Food preparation uses an extensive range of tools and equipment.
5. Different equipment is used to prepare and cook different foods.
6. The correct equipment needs to be selected and used safely for the best results.
7. There are advantages and disadvantages when it comes to using a microwave for cooking and heating food.

TEST YOUR KNOWLEDGE

Multiple choice

1. When measuring 2½ cups of carrot, the correct cups to use are:
   - **a** two ¼ cups
   - **b** one cup and one ½ cup
   - **c** three ¼ cups
   - **d** three cups
   - **e** none of the above.
2. When cooking or heating food, microwaves are good to use when:
   - **a** you want to brown food or make it crisp
   - **b** the food is small and will cook quickly
   - **c** the food is uneven in size
   - **d** the food requires a long, slow cooking process.

True/false

1. When measuring flour with a cup, you should pack the flour in to get the correct quantity.
2. When dicing a carrot, it is a good idea to stop it from rolling by cutting a thin slice off one side first and placing the flat side on the chopping board.
3. Your cook's knife should be put in a sink of hot water and left to soak for five minutes after use.

Short answer

1. When measuring ingredients, accuracy is important to obtain good results. Describe how to accurately measure a liquid such as milk and a dry ingredient such as flour.
2. Name and sketch an example of four different types of measuring equipment available for use at school.
3. Briefly list the differences between cooking equipment made from cast iron and those made from stainless steel.

Extended response

Create a visual glossary album by following the steps below:

1. List each piece of equipment used in this chapter.
2. List the processes used in this chapter.
3. Take pictures of each piece of equipment on your list and upload to make a visual glossary album. Include a definition and statement about function/use with each picture. You could use Pinterest, Photo Story, Prezi, Glogster or Instagram.
4. Do the same for your list of processes, taking pictures in production classes when completing each process.

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CHAPTER 3

Discovering design

ACCESS PRIOR KNOWLEDGE

1. Create three possible design solutions to solve the problem of what to put in your lunchbox tomorrow.
2. Name and outline the stages used when creating design solutions.
3. State three pieces of information that you would usually find in a design brief.
4. Describe how you can investigate options for a solution to a challenge in a design brief.
5. Explain why evaluating is so important after producing a food item. (Consider the processes and the actual food item in your response.)

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3.1 Designing: The basics

All around you are items designed to solve a problem, need or opportunity. **Design** is a part of everyday life, and it is primarily about problem solving. Small items, such as the pen you use, or much larger items, such as the roundabout you went through on your way to school, have all gone through a **design process**. What we grow, eat, make, wear or build, our health and safety, and how we travel and spend our spare time are all related to design.

design An activity that translates an idea into something useful, making it better and improving quality of life; it fulfils a need.

design process A process that typically involves investigating, generating, producing, evaluating, planning and managing to create a design solution that considers social, cultural and environmental factors.

What does this have to do with food? Every day, food presents people with the chance to create **designed solutions** through problem solving and decision making.

The process of planning and preparing a meal or snack – for example, Boost designing a new juice or smoothie – is no different from the process that other designers go through.

When designing at home or school, this process is simplified, but it is always fundamentally the same. The problem of what to eat, the options available and the solution you find are part of working through the design process in order to find design solutions.

The information in Chapters 1 and 2 developed your knowledge to help you make good safety and equipment decisions. The chapters that follow will build your knowledge to enable you to make decisions about food options. Knowledge of food, equipment and processes is critical in the design process so you can develop a quality final **product** solution.

designed solutions The products, services or environments that have been created for a specific purpose or intention as a result of design thinking, design processes and production processes.

product One of the outputs of the design and production processes. Products are the tangible end results of natural, human, mechanical, manufacturing, electronic or digital processes to meet a need or want.

Figure 3.1 All these items passed through a design process.

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DESIGN THINKING

Members of your family are going to a football game and would like a quick, healthy and tasty meal beforehand because the snacks at the venue are too expensive and the queues too long. The problem becomes your **design brief**. Consider your options. In all aspects of design, knowledge is required about the material with which you are working and the best ways to achieve your final solution, together with evaluation to think about what worked well and possible changes for next time. A recipe will give you part of a solution to a problem. With knowledge of food and food preparation processes, you can alter the recipe to meet needs or other challenges. Sometimes creating the recipe can be part of creating the meal.

design brief A concise statement clarifying the project task and defining the need or opportunity to be resolved after some analysis, investigation and research. It usually identifies the users, criteria for success, constraints, available resources and timeframe for the project, and may include some possible consequences and impacts.

Figure 3.2 These are all possible solutions for the problem of producing a quick meal before going to a football game.

Figure 3.3 These new product innovations were responses to the needs and wants of consumers.

3.1 ACTIVITY

Designing dinner

The Club Sandwich recipe on pp.67–8 could be a possible solution for the family meal. This product requires minimal skill and includes ingredients that are likely to be readily available – both things that have to be considered in meal planning in response to the needs of the design brief.

1. Explain how this meal suits the requirements of the meal before the football game.
2. Generate three other variations that could be added or adapted for the filling.
3. Compare your selection with that of your partner. Note how the variations will vary depending on your tastes, foods with which you are familiar, and your knowledge of food and what goes together. These decisions are all part of the design process.

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Club Sandwich

USA

Main tools and equipment

Grill, vegetable knife, chopping board, measuring spoons, butter knife, frying pan, tongs

Production processes

Measuring, slicing

Cooking processes

Frying, toasting

MAKES 2

Preparation time: 15 minutes

Cooking time: 20–25 minutes

Serving and presentation: 5 minutes

Total time: 40–45 minutes

Ingredients

 1 chicken breast	 1 teaspoon oil	 2 bacon rashers	 6 slices bread	 1 Roma tomato, thinly sliced
 4 butter lettuce leaves, washed	 2 tablespoons mayonnaise	 2 teaspoons Dijon mustard	8 toothpicks	

Method

1. Slice chicken breast into two thin pieces.
2. Heat oil in a frying pan. Cook both pieces of chicken.
3. Remove chicken from pan when cooked all the way through. Drain on paper towel.
4. Cook bacon in frying pan. Remove when cooked.
5. Toast bread, either on the grill or using an electric toaster.
6. Spread mustard onto two slices of toast. Spread mayonnaise on remaining slices of bread.
7. Place mustard toast on a plate. Top with cooked chicken, then lettuce.
8. Place a mayonnaise toast on top of your lettuce, then layer with half the tomato and one slice of bacon. Place another slice of mustard toast on top.

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Club Sandwich – continued

RECIPE

9 Place four toothpicks into each quarter of your triple-decker sandwich to stop it falling apart. Slice into triangles.

10 Serve your Club Sandwich triangles standing up on their crusts to show off your layering.

Evaluating

1 Develop a list of other ingredients that could be used.

2 Suggest how you might be able to modify this from a light snack/meal to a main meal.

3 Outline three safety considerations that you needed to be mindful of when making your sandwich.

4 Would you like to open up your lunchbox and find this sandwich inside? Discuss your reasons why or why not.

5 Research how the Club Sandwich got its name.

6 List any other types of sandwiches with which you are familiar. Here is one to get you started: the BLT.

3.2 Identifying a need or opportunity

The design process starts from a need or opportunity. In food preparation, problems or scenarios exist all the time. What will I have for lunch? This fried rice needs to be made for a vegan. I have sport in an hour, but I need to have a quick meal first. This savoury muffin would taste better if it had some fresh herbs in it. In **design thinking**, these problems are written as a design brief.

design thinking Use of strategies for understanding design problems and opportunities, visualising and generating creative and innovative ideas, and analysing and evaluating those ideas that best meet the criteria for success and planning.

In responding to each of these problems, you are actively identifying needs, wants, opportunities and areas for change or improvement, as well as considering restrictions or guidelines that may have been provided.

Really simple but very useful things have emerged as the result of critiquing needs or investigating opportunities – for example, paper clips, Post-it notes, matches, Velcro and safety pins. These items are all cleverly designed solutions that resulted from a design process, involving a design brief; investigating; generating; planning; managing; producing; and evaluating.

Since their initial production, all these products have continued to improve and transform to meet changing needs or use new materials as required.

Tasty Trivia Some useful Australian inventions that were responses to a challenge are the Flow Hive (2015) for sustainable harvesting of honey, the Reading Machine for the blind (1990), the Victa lawnmower (1952) and the Hills Hoist rotary clothes line (1947).

Figure 3.4 The Flow Hive is a revolutionary Australian way of harvesting honey with hardly any disturbance to the bees.

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Figure 3.5 Examples of created solutions to different design problems.

3.2 LET'S COLLABORATE

Select one of the items in Figure 3.5 and discuss the history of the design brief and the possible problem that existed, showing a need for each of these items. Where might ideas and solutions have been generated?

Tasty Trivia

The first teabags in 1904 were in fact samples of tea in little silk bags meant for the promotion of different teas. Commercial teabags did not appear on the market until the mid-1950s. Consumers wanted to be able to have a cup of tea without the need for implements such as a teapot and strainer, and without having to empty the teapot in between uses. A recent innovation is the pyramid tea bag, which allows large, higher-quality tea leaves to be inserted and has bigger holes in its mesh so that water comes into contact with more of the leaves' surface – all contributing to a better cup of tea.

Figure 3.6 The invention of pyramid-shaped bags has improved tea brewing.

3.3 Learning about design briefs

The design brief is the problem, need or opportunity written out. At home or in the canteen queue, the problem is just a part of a conversation. 'What will I have for lunch? It is hot today and I don't feel very hungry' or 'What will we have for dinner tonight? We have plenty of vegetables and some chicken.'

For each problem, barriers will exist that limit possible solutions. For example, 'What will I have for lunch?' may be influenced by how much money you have, whether you have food allergies, or any ethical or cultural considerations. These are referred to as **specifications**. The combination of the information related to the challenge and specifications becomes the design brief.

specifications Constraints and considerations or issues that will need to be thought about when you come up with a solution.

A design brief is a statement that contains:

- an opportunity, problem or need – what has to be solved
- background to the problem, usually written as a scenario
- specifications or guidelines that apply to the problem
- constraints (aspects that are 'fixed')
- considerations (aspects that have some flexibility).

The design brief provides the designer with a range of factors that must be considered when thinking of a solution or solutions to the problem – for example, who is it for (intended audience)? How is it to be used? What food is available? Are there any time or equipment considerations? A design brief never contains the solution to the problem; it is simply the problem, need or opportunity waiting to be solved.

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3.3 ACTIVITY

Summer snacking

You are to design a tasty, filling snack for a quick meal in the summer holidays. The snack is to be made by a group of teenagers with limited cooking skills, although they can use a microwave and an oven. They would like a healthy, nutritious and tasty snack. They enjoy eating chips and don't mind spicy foods. It is a casual meal, so the snack will be finger food that is shared. One of them is allergic to onion.

Write down the constraints of and considerations for this brief.

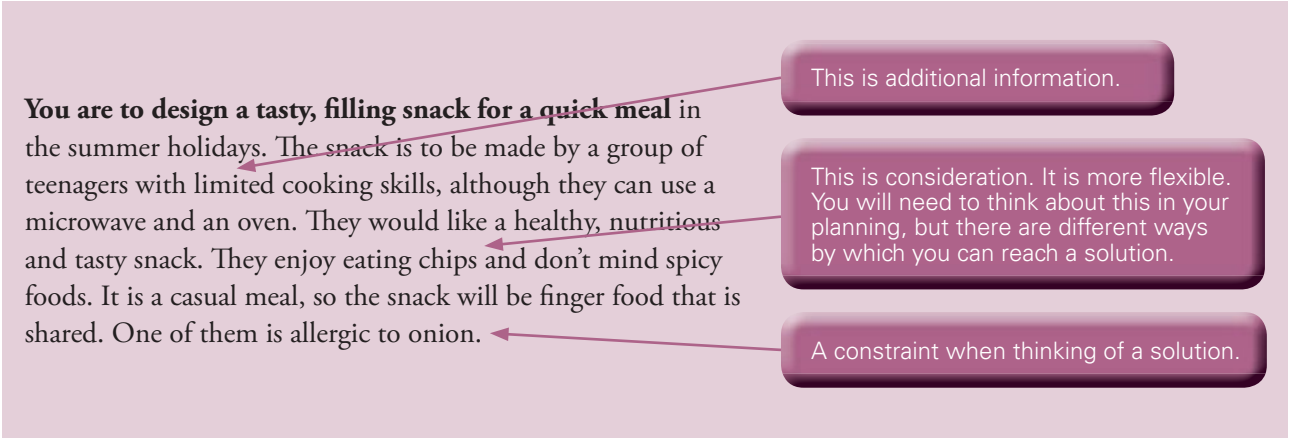

Figure 3.7 A design brief for a quick snack showing the different parts of the brief.

3.4 ACTIVITY

What will I have for breakfast?

Imagine you are at home and that the problem is what you will have for breakfast. Make a list of all the possible specifications that may influence the final decision. Your specifications are like barriers or boundaries: they are issues that will limit your possible solutions when generating and designing ideas. Compare your list with that of a partner.

The list you developed in Activity 3.4 is like the specifications in a design brief. They are important when planning your solution.

In the commercial world, the design brief contains the important guidelines that a client gives to the designer. It communicates the need or opportunity and the issues that must be considered when you are creating designed solutions. In the brief, the guidelines or specifications for the problem are set out so that the designer knows what their limitations are when designing a solution to

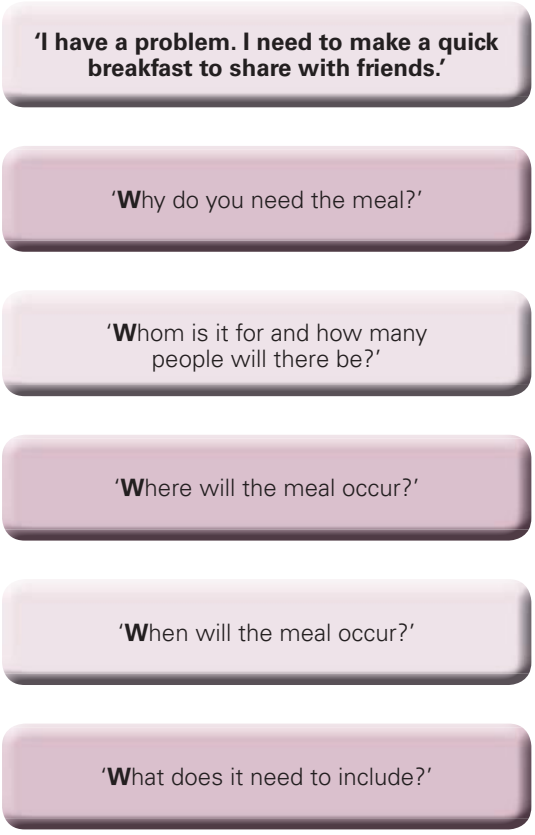

Figure 3.8 Design briefs often include information about the 'Five W' questions.

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3.5 LET'S COLLABORATE

Write a design brief for the breakfast outlined in Activity 3.4 on p.70 in your workbook and include responses to the 'Five Ws'. Fill in the gaps for the last four 'W' questions. For example:

1. Friends are coming over after swimming. Everyone will be hungry. (Why?)
2. The lunch is for … (Whom?)
3. It will be held at … (Where?)
4. During … (When?)
5. One person who is coming likes … (What?)

When these are put together in one paragraph, they form a design brief.

meet the problem. The style of a design brief may vary; minimal detail or a lot of detail can be documented during the design process.

Think about the clothes you are wearing or the pen you are using. Explain what some of the design specifications might be for each of these items. (*Hint:* would an outfit made from steel or a 30 cm-long pen be workable?)

Developing criteria for success

A design brief should allow for the identification of the most important part/s of the design. In a well-established design process, evaluation will occur when the solution to the design brief has been completed. The criteria used for evaluating the product will come out of the design brief. These are referred to as the **criteria for success**.

criteria for success Questions developed to check whether you have made something to meet the requirements of the design brief. The criteria for success should come out of the design brief.

DESIGN THINKING

You have decided to have a burger party for 10 friends for your 13th birthday. You want variety in the burgers to satisfy a range of tastes, but it should be easy for everyone to put their own together. In the group, some people like red meat, but several do not and one is vegetarian. The hamburgers will be served with different salad ingredients and flavourings. You also want a simple, tasty dessert for afterwards.

1. How will the burgers be able to satisfy a range of tastes?
2. Are people able to put their own burgers together?
3. How are different salad ingredients incorporated?
4. What makes these burgers suitable for a vegetarian?

3.6 LET'S COLLABORATE

Using the design brief for the snack outlined in Figure 3.7 on p.70, generate three other criteria for success that you could use during the evaluating stage. Remember that the criteria are used to assess the success of your product solution – the completed snack – in meeting the brief. Remember that the criteria can only come from the design brief.

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3.7 ACTIVITY

End-of-term party

Your class is having an end-of-term afternoon tea and everyone must bring a plate. You have decided to make cupcakes. You want variety in the cupcakes to satisfy a range of tastes. In the class of 25, some people like chocolate, but several do not and one cupcake needs to be gluten free. The cupcakes will need to have a variety of different flavourings. You also want to include a unique cupcake for your teacher.

1. Write down the constraints and considerations for this brief.
2. Generate three suitable criteria for success questions from this brief.

Figure 3.9 Once the criteria for success are established, it is time to start investigating options for solutions to the problem.

REFLECT ON LEARNING

1. Explain the role of a design brief.
2. Outline what is not included in a design brief.
3. Do you face any daily food problems? Explain the daily food needs and opportunities you experience and identify people who are involved in your food decisions.
4. Describe how criteria for success are generated.
5. Discuss why you need to evaluate your product using the criteria for success at the end of the design process.

3.4 Following the stages of the design process

investigating The problem is developed as a result of critiquing needs or investigating opportunities of designed solutions.

generating Developing and creating a number of ideas or solutions.

The flow chart in Figure 3.10 makes it easier to see what happens at each stage in the design process. Designing and making a final product involves **investigating**, **generating**, **producing**, **evaluating and analysing**, planning and managing products.

producing Actively realising (making) the designed solutions using appropriate resources and means of production.

evaluating and analysing The process used to assess how successful the solution to the challenge is and how the design process can be improved in the future.

3.5 Investigating

The first stages involve investigating, gathering information and building knowledge about the impact of the specifications, and the best way to design possible solutions. It means looking at possible alternatives that exist and solutions that have been applied to similar problems. It may also involve looking at areas for potential improvement of existing solutions or coming up with totally new and innovative ideas.

Sources of information (research) include:

- existing solutions – recipe books
- guiding information available – people, books, magazines, the internet, television, tablet and smartphone apps
- target market for the product – who the product is for, their general likes and dislikes that you know about.

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Tasty Trivia

Most people think children are the biggest consumers of ice-cream. Do you agree? Yet research suggests that adult males are the largest consumers of ice-cream – particularly gourmet ice-cream.

Stage of the design process	Steps in this stage	For example ...
Investigating	Critique needs or opportunities for designing and investigate. Analyse and select from a range of materials, components, tools, equipment and processes to develop design ideas.	Identify the specifications of the brief. Develop criteria for success.
Generating	Generate, develop and test design ideas, plans and processes using appropriate technical terms and technologies, including graphical representation techniques.	A number of solution ideas are researched and developed before a final solution is decided upon. Prepare annotated (labelled) images or models of design options.
Planning and managing	Use project-management processes to coordinate production of designed solutions.	Prepare your **production processes** plan, stating the steps that you will need to take to produce your chosen solution. Include time, ingredients, tools and equipment, cooking processes, safety and hygiene. Determine whether you work as a member of a team (**collaborating**) or individually, depending on your solution.
Producing	Effectively and safely use a broad range of materials, components, tools, equipment and techniques to produce designed solutions.	Make the food using your recipe. Safety guidelines are considered. Properties of food are considered (physical, sensory, chemical and functional).
Evaluating	Independently develop criteria for success to evaluate design ideas, processes and solutions, and their **sustainability**.	Evaluate food. Analyse the processes. Use your set criteria for success to evaluate your designed solution. Suggest improvements. Reflect on modifications, and planning efficiency and effectiveness.

production processes The steps used to produce a product.

collaborating Working and communicating well with others within a team environment.

sustainability Meeting the needs of the present without compromising the ability of future generations to meet their own needs.

Figure 3.10 The five stages of the design process and how they can be put to practice.

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3.8 LET'S COLLABORATE

Have you heard of the term 'target market'? You are part of a target market! Explain what the *target* for the product means. You need to check to see who the food is being prepared for.

Different groups will have different likes and dislikes regarding some food. In pairs, compare possible likes and dislikes for children and adults as though you were preparing a healthy snack. Research the names of the different target markets used in marketing.

Investigating also involves looking at the resources that currently exist. In food preparation, this includes all the issues discussed in Chapters 1 and 2, as well as other issues relating to health requirements; availability of resources such as money, time, knowledge, skills and equipment; and the properties of food – physical, sensory, chemical and functional.

In food preparation, the problem is often solved by finding a recipe that is suitable; when you are more experienced, you can design your own. Activity 3.9 is an example of a design brief for a snack food.

3.9 ACTIVITY

Feeding your friends

Several teenagers want a warm, tasty, filling winter snack to eat at the snow. The snack is to be made by them and they have limited cooking skills, although they can use a microwave and an oven. They all like vegetables, but one person is unable to eat tomatoes. To make the snack easier to eat, it needs to be in a wrap as it is a casual meal; therefore, the snack will be finger food that is shared. One person is a vegetarian, so there is no meat in the snack.

1. Prepare four criteria for success to evaluate your final product solution.
2. Use a digital graphic organiser to develop a mind map of your generated design solutions (options) for a suitable snack.

3.6 Generating

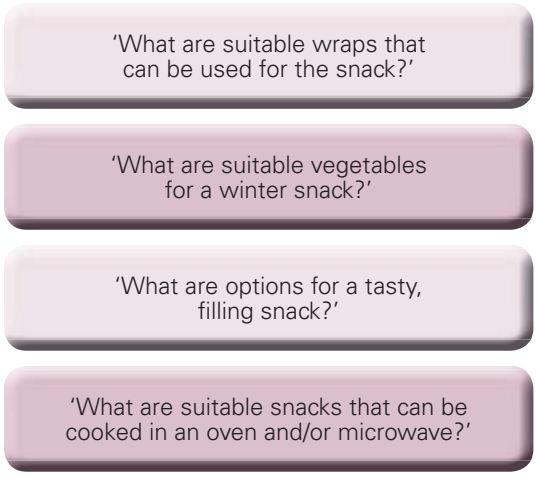

Figure 3.11 These questions could be asked while generating options for solutions to the design brief in Activity 3.9.

Here you generate possible options. This stage in the design process is an important step in transforming ideas into creative and practical realities by making the most of the different foods and pieces of equipment available.

Once you are aware of the options, it is time to make the final decision. This decision-making includes being able to justify your final choice, linking it directly back to the design brief. You also need to explore how your final product will look and be presented. This can be done by simply drawing a picture of how you would like your product to look and then labelling it or perhaps creating a model of your product using Web 2.0 tools.

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Adapt that!

Adapting or making changes is an excellent way to try something new, or to improve a product solution. It can also help you to turn what may not meet the design brief into something that does.

Recipe adaptions might include:

- changing from using a dried to a fresh product, such as pasta (or vice versa)
- swapping the protein – for example, chicken to turkey
- changing the cooking method – for instance, roasting to grilling
- altering how the ingredients are prepared – such as crushing to dicing.

Making big or small changes to a recipe can alter the flavour, presentation and final properties of the product. Never be frightened to try something new or make a mistake; sometimes it is the mistakes that turn out the best.

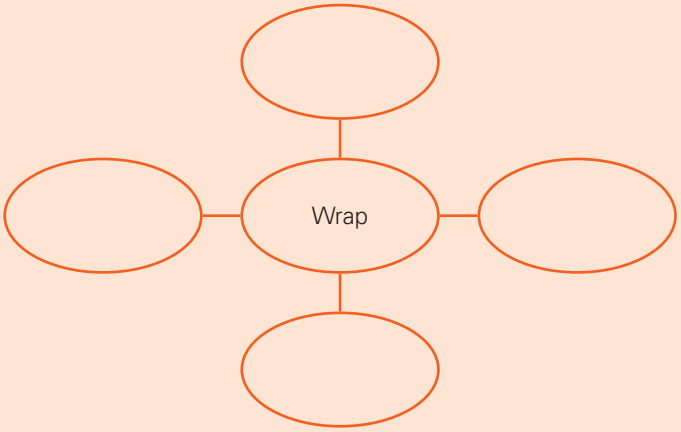
Once a recipe has been found or written, it is time to produce your solution to the design brief.

CREATE A SOLUTION

A search for a recipe will give you a quick solution or, if you are more skilled, a recipe may give you an idea that you can adapt to make your own solution. When generating and thinking of options for a design brief, use a graphic organiser such as a mind map. Let's look at some options for the questions asked in Figure 3.11.

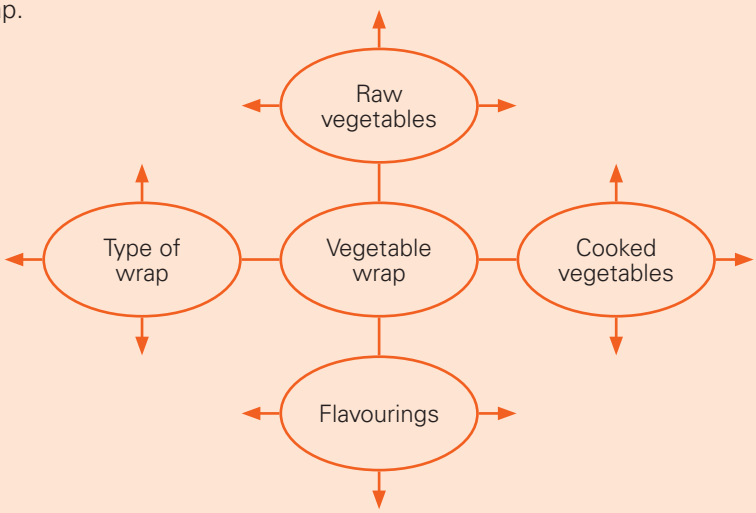
Identify suitable wraps that can be used for the snack, such as lavosh bread, rice-paper sheets and tortillas.

Develop a mind map like the one below and brainstorm wrap options.



Highlight or draw a box around the option you prefer. Justify your choice.

Complete a similar mind map for the other questions in Figure 3.11. The options can also be drawn as a much larger mind map.



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3.10 INVESTIGATE IT

Investigate the adaptions or modifications required to ensure the Club Sandwich recipe on pp.67–8 is adapted to meet the needs of the following consumers: gluten free, vegan, fructose free.

Research each of the different requirements listed below. Provide a definition and then use your new knowledge to identify the ingredients that are not suitable for consumption and suggest an adaption to use instead.

Requirement	Definition	Ingredient changes needed	Adaptions
Gluten free			
Vegan			
Fructose free			

3.11 LET'S COLLABORATE

Try a fruity version. What are some options for a fruity wrap? One suggestion is mashed banana mixed with honey, sultanas and cinnamon. What does the class think?

3.7 Planning and managing

A successful solution is the result of successful **project management**. When you work through the design process and produce your final design solution, you will be responsible for a number of different tasks using a variety of skills and knowledge. This part of the design process occurs throughout the different stages: planning solutions during generation; using the plan during production; and reviewing management skills during evaluation. At times, this will be done collaboratively as part of a team; at others, it may be done individually, depending on the requirements of the problem or project.

project management The responsibility for planning, organising, controlling resources, monitoring timelines and activities, and completing a project to achieve a goal that meets identified criteria for judging success.

Successfully carrying out the design process involves the development of considered plans, establishing sequences and applying the plan to produce the final product or food item solution.

When completing the design process, you may work individually or as a member of a team. When you are cooking for yourself or your family, usually one person can easily carry out the tasks required – especially if they have a plan in place. Catering for a large group of people or hosting a function may involve more than one person. There are often many tasks and problems to solve, and they can be tackled more effectively if a team of people is involved.

Working collaboratively as a member of a team ensures everything that needs to be completed in time gets done. When working in a team, planning and organisation are essential, as everyone needs to work towards the common goal and ensure that they know what they have to manage and that they are able to fit in with others. The key here is teamwork: good planning and effective communication.

3.12 LET'S COLLABORATE

1 Think about a time when you had to work as a member of a team. Was it successful?

2 Discuss the factors that ensure a team works well. Discuss the factors that can stop a team working well. Explain the saying 'A team is only as strong as its weakest member.'

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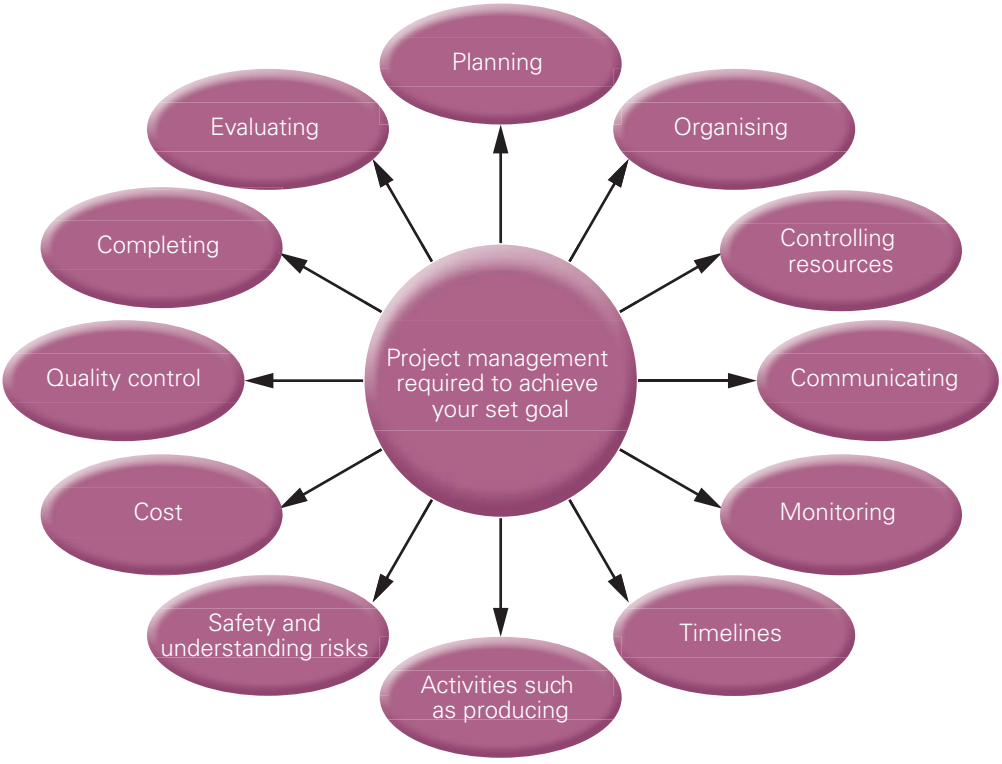

Figure 3.12 What is involved in project management?

3.13 LET'S COLLABORATE

Work collaboratively with a partner to find a recipe in this book that you might like to produce together.

Using the production plan template in Activity 3.15 on p.78, develop a production plan to help manage the cooking of the recipe.

If you get the chance, cook the recipe at home using only your plan. Then try to determine how effective your plan was.

3.8 Producing: Making the proposed solution

Once all the design options have been explored and the solution has been reached, it is time to make the food item. This is when you apply the skills and knowledge you have acquired about safety and hygiene, use tools and equipment appropriately and utilise correct techniques. You logically follow the steps of the recipe that you have developed or the one that has been produced for you. The aim is to make the highest quality product possible. The product must also meet the requirements of the design brief.

3.14 INVESTIGATE IT

Check out the websites for these car companies to see the design features of cars that have developed from a prototype:

- Ford Australia
- Holden
- Tesla.

The car industry may spend millions of dollars developing a prototype that never gets to the market. Suggest why you think this might occur.

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Work plan for Club Sandwich

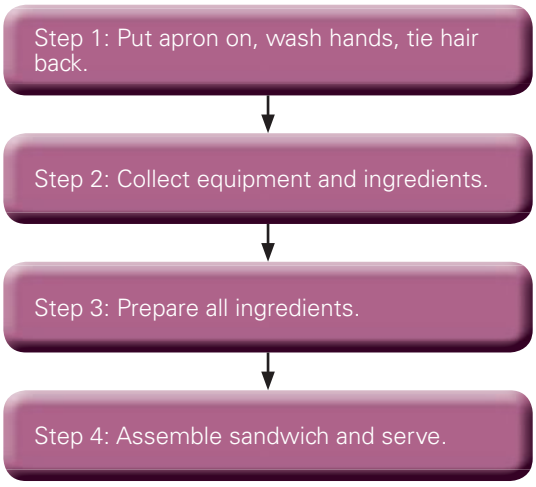

Figure 3.13 Design briefs often include information about the 'Five W' questions.

Developing a work plan or production plan helps you to think through all the steps of the production process, not just the steps in the recipe. It also helps to identify where management of health and safety, and of quality, is necessary. This helps you to effectively project manage your product. This will be discussed more in the managing projects and working collaboratively step of the design process.

If a trial food item is made, this is referred to as a **prototype**. In industry, prototypes are always made, as the manufacturer has to be sure that everything is going to work correctly; otherwise they can waste a lot of money. This applies to all aspects of the process, including the recipe, ingredients, preparation techniques, equipment to be used, taste, size and desired shape. When a food item is made at home, it is not an official prototype, but you will obviously change any part of the process or final product that does not work before you prepare it again or else not make it again.

prototype A trial item made to test an idea or process in order to inform further design development.

During production, you may make modifications or changes if it is apparent that something will not work as well as expected, or a piece of equipment is not available. In the school food-preparation area, modifications are made frequently – for example, if the microwave is not available to melt some chocolate, it is done in a basin over hot water on the stove.

Modifications need knowledge of equipment and ingredients to enable you to select suitable alternatives and continue to maintain the quality of a product.

3.15 LET'S COLLABORATE

Complete the production plan in Figure 3.13 for the Club Sandwich or another selected recipe. Use this template to help you. Record the parts of this task you found difficult.

Production plan

Recipe name:

Source:

Time (in 10 minute intervals)	Ingredients	Tools and equipment	Production processes	Safety and hygiene	Modifications

REFLECT ON LEARNING

1. Explain why you need to investigate different options for design solutions.
2. List three different sources of information that could be used to help generate ideas.
3. Describe the importance of planning and managing your production. Outline the potential benefits of being well prepared before you start producing.
4. If you make a trial food product solution, what is it called? Write the definition of this process.
5. Discuss when you might modify a step in the production process of a food item.

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3.9 Evaluating: Checking the finished product and processes

The evaluation process occurs in order to ensure that the final product solution actually solves the problem stated in the design brief. For example, in making the Club Sandwich on pp.67–8, has the problem of making a tasty snack actually been resolved in the final product solution?

Using criteria for success

In food preparation at home, at the school canteen or in a restaurant, this step in the process may be informal, but it does occur. In a restaurant, when the chef introduces a new dish, if the plate comes back with a lot of leftovers, then the chef needs to question why. Evaluations assess the properties of food, the processes that occurred and whether the finished product meets specific requirements in the brief – for example, in the brief for Activity 3.9 on p.74, is the snack vegetarian?

3.16 ACTIVITY

Evaluate a food item you have made

Use the criteria for success you outlined in Activity 3.9 on p.74 and write a short paragraph responding to each criterion.

A good evaluation response has more than yes/no answers. If a criterion was 'Is the snack tasty and filling?', give your opinion and use examples to justify your answer – perhaps the type of cheese, how the amount of cheese added to the taste and how filling it was. If your response is negative, you need to suggest how the situation could have been improved or what modifications you would make in the future.

'This snack was easy to make. We only needed to use the oven and the preparation of the ingredients was simple.'

'This is a tasty, filling snack. It has a lot of different flavours and textures.'

Figure 3.14 Responding to criteria for the design brief

Evaluating properties of food

Satisfying the senses is one of the key objectives of food preparation and processing. A lot of evaluation of food is **subjective**. It is based on opinions rather than facts, but opinions are very important when it comes to food. If it does not look, smell, taste and feel good, you will not eat it! At home, informal comments evaluate the food eaten, such as 'this taco is too hot, it has too much chilli in it' or 'the avocado in this salad gives it a tasty, smooth texture'. These are comments or **descriptive words** used to give impressions about the sensory properties of the food, particularly taste.

subjective A view about food that is based on opinion rather than facts – for example, based on taste, look, smell and feel.

descriptive words Words used to describe characteristics of food – for example, for appearance, translucent, watery, colourful, bright red; for texture, crunchy, crisp.

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3.17 LET'S COLLABORATE

1. List your favourite foods and explain why you like them. Provide a sensory description of each food in your response.
2. Identify any food allergies you have.
3. Name the foods that you dislike because of their taste.
4. Name the foods that you really enjoy eating due to their mouthfeel.
5. Compare your thoughts with those of others in the class.
6. Design an electronic survey to collect data on the tastes of others. Collect data from 10 different people, ranging in age, and compare and contrast your results with those of others in your class.
7. Identify any foods that you have in common with others.
8. Analyse the dislikes data. Perhaps you could design a recipe to help change the opinion of the number one food that is disliked according to your data.

Evaluation of properties can use descriptive words or other sensory tests. The simplest test used for evaluation is a *hedonic scale*. It can be used for an overall opinion about the properties, or a specific property such as taste. Another test used for evaluating food is *ranking*. This is when you make a decision about which food you prefer when you compare foods.

3.18 LET'S COLLABORATE

How many descriptive words can you think of to describe the properties of food?

1. Write down one word for each letter of the alphabet. Include words for sensory, physical and chemical properties.
2. Beside each word put an S for sensory, P for physical or C for chemical.

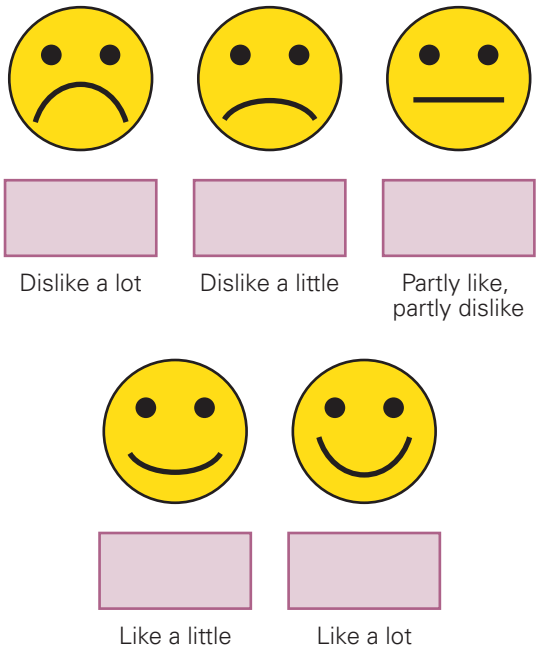

Figure 3.15 This is an example of the hedonic scale. The hedonic scale is a simple way to help you to evaluate food.

Looking at food

One of your first impressions of food is by sight. How does the food look? If a food looks good, you will be tempted to try it. It is very important that the final presentation of your product is the best that it can possibly be.

Appearance preferences in food can also vary and change with fashions. Compare the photographs in a very old recipe book with a more modern book. In the 1960s, a lot of food was served on a plate and the food was more complicated; today, less food is served and it is generally minimally prepared and fresher looking.

Figure 3.16 Does this look appetising?

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3.19 LET'S COLLABORATE

1 For each of the dishes pictured, write a sentence describing the appearance of the product.
2 Compare your sentences with those of the person sitting next to you – how similar or dissimilar are they?
3 Discuss whether the sentences are linked to your personal likes and dislikes. For example, if the photograph was of cooked sheep's kidneys, would that influence your impressions?
4 Select the photograph with the most negative comments and write down two ideas for improving its appearance.

Analysing the processes and reflecting on your work

As well as responding to the criteria for success, it is also worth analysing the actual processes that have occurred. In analysing the final product solution, you should note the feedback from other students or the teacher. This section is also important for self-assessment.

'This time I grated the cheese; next time I will slice the cheese.'

'My partner did not like the look of my wrap because I folded it in half and it partly opened. I am not sure I completely agree with what they said.'

'This time I used a tomato and it made the filling watery. Next time I will …'

'I was not very efficient when working today. I wasted too much time talking.'

Figure 3.17 Responding to criteria for the design brief

Your analysis of the process and use of equipment could be presented as a table. Write up what worked, areas for improvement and what you would do next time in a table like the one that follows.

REFLECT ON LEARNING

This worked	Areas for improvement	Next time I could try …

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Self-assessment

As well as assessing the food you have produced and the processes you have used, take time to think about how well what you have done has worked. Don't be disappointed if your product has not worked to your satisfaction, as long as you can identify what needs improving. There are several questions you can ask yourself to think about your progress. One simple way of doing this is called the 'feedback sandwich'. It is called a sandwich because the good news is the bread and the bad news or the things that can be improved make up the filling.

Other questions that can be asked or statements that can be made are:

- Today I learnt …
- My strength today was …
- I supported my friends in class today by …
- One thing I was not sure about today was …
- An area I can improve on was …

Figure 3.18 The feedback sandwich is a handy tool for self-assessment.

Providing feedback and working collaboratively

Often your peers are a useful source of information on how well you worked or how well your product turned out. Remember, though, as was discussed earlier, evaluating food is subjective. Different people have different opinions, likes and dislikes.

When you are evaluating your food, what you think looks good may not be the same for someone else. If you criticise other students' food, you must be able to justify your decisions.

The feedback sandwich can also be used to provide feedback on your friends' work. Instead of using 'I' in each statement, change it to 'you'.

REFLECT ON LEARNING

1. Explain why it is important to evaluate a food item after you have produced it.
2. Explain what it means when you say the evaluation of food is subjective.
3. When people evaluate the same food they often come up with different responses. Outline why this occurs.
4. Describe how project managing your proposed design solution and ensuring you have a carefully considered plan help to ensure the success of a design brief.
5. Discuss why the 'feedback sandwich' is useful when giving feedback to your peers.
6. Explain why it is necessary to analyse and reflect on your own work and how well you carried out the production.

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LOOKING BACK

Figure 3.19 shows the steps in the design process.

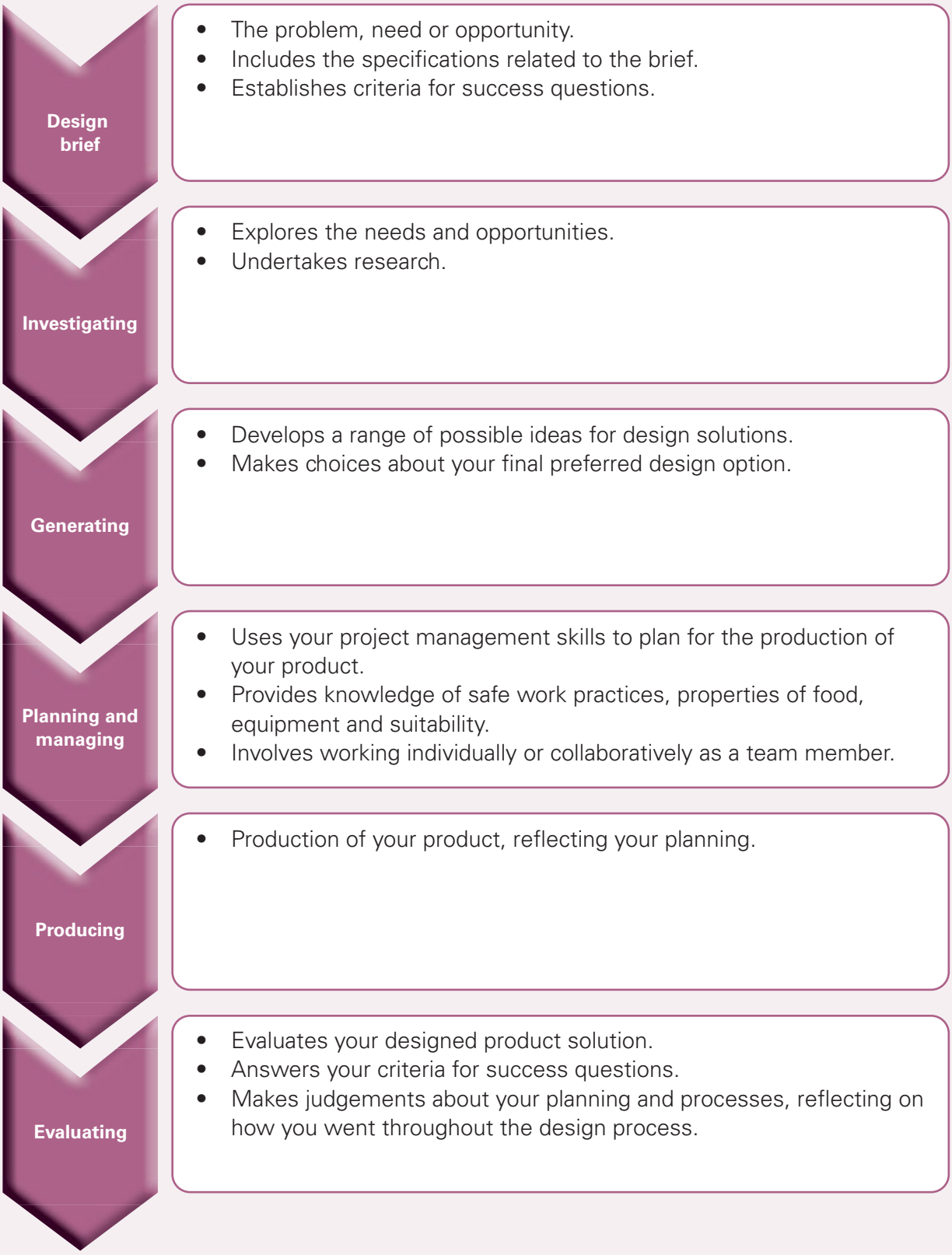

Figure 3.19 The different stages in the design process.

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TEST YOUR KNOWLEDGE

Multiple choice

1 In a design brief, a consideration is:
   - **a** the flexible parts of the brief
   - **b** the scenario or challenge
   - **c** the non-flexible parts of the brief – that is, things you cannot change
   - **d** a solution to the brief.

2 Criteria are used to evaluate the food you make. The criteria for success come from:
   - **a** ideas that your friends have about what you should cook
   - **b** consideration in the design brief
   - **c** the background or scenario in the brief
   - **d** any part of the brief.

3 Successful collaboration involves:
   - **a** working as an effective member of your team and communicating well
   - **b** cooperating with everyone
   - **c** working independently but within a team
   - **d** doing everything together.

Short answer

1 Sometimes when students complain about the food available at a school canteen, they do not think about the considerations and constraints that influence the range of food available. List three considerations and three constraints that are important when planning food suitable for a school canteen lunch.

2 Describe two approaches the canteen would use to informally gather information to help evaluate or analyse the success or failure of food that is sold at the canteen.

3 Develop a survey that could be used by your peers to analyse a food-production session. Include at least five questions, covering your work processes and project-management skills, your final food product solution and your ability to work collaboratively with your peers.

Extended response

The following is a design brief for a Halloween party.

There are four friends meeting to go out trick or treating. They will then come back to your house for a quick meal. One of your friends is gluten intolerant (this means he cannot eat products containing gluten, including wheat) and another person cannot eat pork. You want to be able to whip up your meal quickly so that you can start eating the treats you have collected. Mum says you have to eat your dinner first! Everybody is pretty relaxed about what they eat but you know you will all be pretty hungry after being out.

1 Identify two considerations and two constraints contained in the brief.

2 Write three criteria for success that could be used to evaluate the food made for the Halloween party.

3 Investigate and generate a list of design solutions for the meal. Check that they match the considerations and constraints.

4 Select your final design solution, providing a justification for why you have chosen this option. Remember that you must link this back to the design brief.

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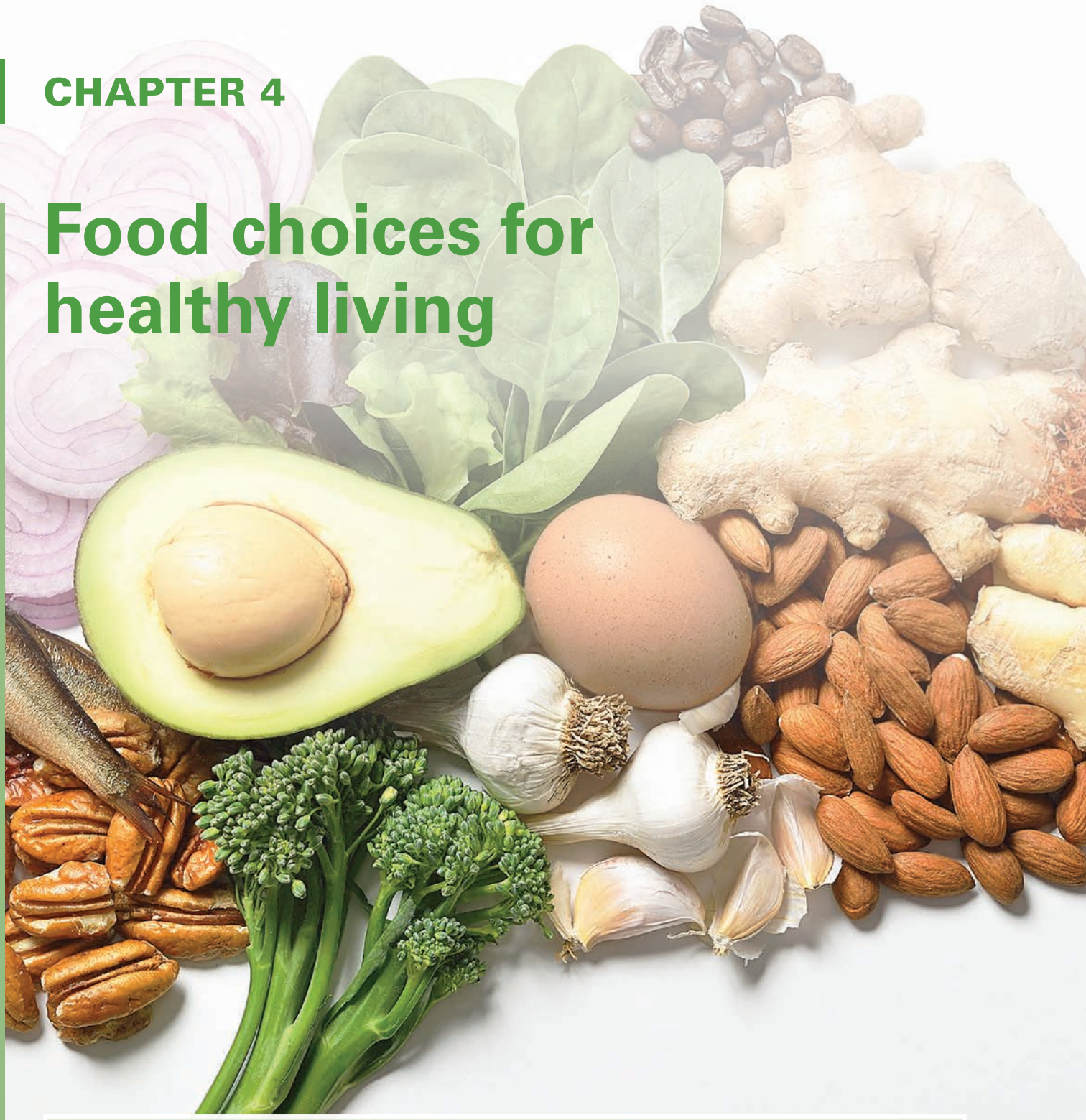
CHAPTER 4

Food choices for healthy living



ACCESS PRIOR KNOWLEDGE

1. Discuss this statement: 'Without nutritious food, our bodies do not function efficiently.'
2. List the key food groups.
3. Identify the six nutrient groups.
4. Explain the function of one of the key nutrient groups.
5. Name one food-selection model. Discuss how food-selection models help us to make healthy food choices.

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4.1 Food: Its definition and purpose

food A substance, composed primarily of carbohydrates, fats, water and/or proteins, that is a source of nutrients consumed by humans and animals. Food is required for growth and energy.

nutrients The chemical compounds found in food that are used by the body to enable it to function and grow.

Food is any substance that we eat or drink. We eat food to nourish our bodies and to help reduce the risk of health problems. We also often eat for pleasure because of the taste of food and/or to enjoy the company of friends in a social setting. Food contains a number of **nutrients**:

- carbohydrates
- fats
- proteins
- vitamins
- minerals
- water.

Figure 4.1 We often eat not because we need to, but for pleasure.

4.1 LET'S COLLABORATE

What's your …?

Conduct a survey of the class to find out the answers to the following questions:

1. What's your favourite food?
2. What's a food that you eat every day?
3. What's a food that you eat sometimes?
4. What's a food that you eat for pleasure?
5. What's a food that you eat just because you have to?
6. What's your least favourite food?

4.2 What does healthy eating mean?

Healthy eating provides nutritious foods in the correct quantities in order to ensure the **efficient** functioning of the body. If we don't choose healthy foods, our bodies do not work as well as they should. Choosing healthy foods ensures that our bodies have the necessary nutrients required for us to be fit and healthy.

efficient Performing in an organised and optimal manner.

Tasty Trivia

Eating three well-balanced, healthy meals every day gives your body a steady supply of vital nutrients for good health and efficient functioning.

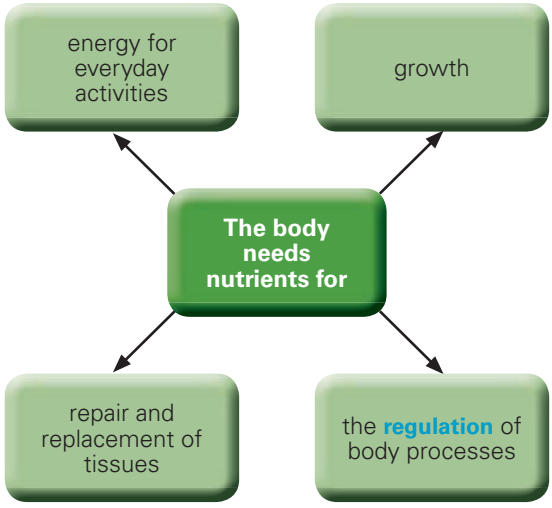

Figure 4.2 Food provides the nutrients we need to keep our bodies functioning efficiently.

regulation The control of a process to ensure that it functions correctly.

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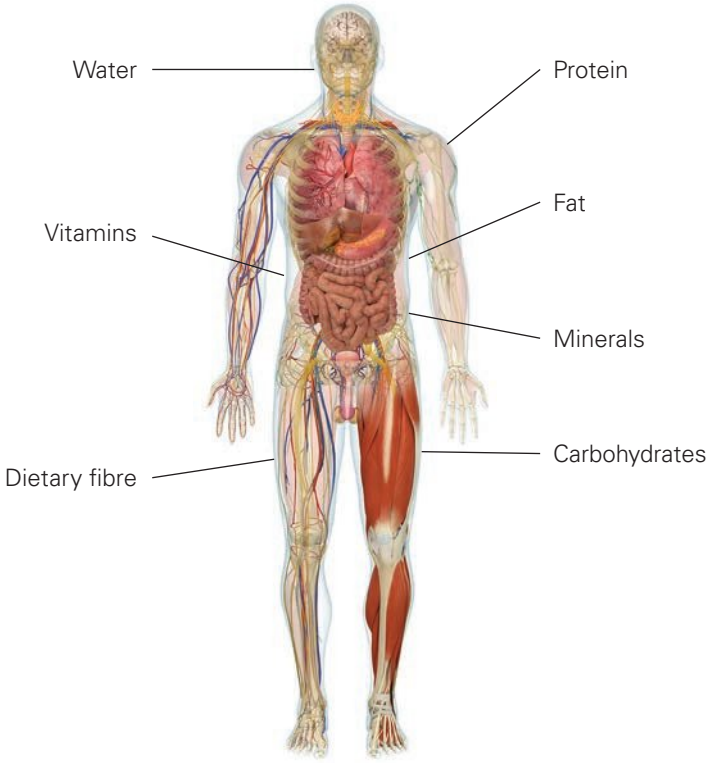

Figure 4.3 Nutrients are required for energy, growth and the repair, replacement and regulation of body processes.

The key food groups

In order to have a balanced diet we need to eat a wide variety of foods from each of the key food groups in the recommended amounts. The key food groups are:

1 vegetables and legumes/beans

2 fruits

3 grains (**cereals**), mostly wholegrain and/or high cereal fibre varieties

4 **lean meat** and poultry, fish, eggs, tofu, nuts and seeds, and legumes/beans

5 milk, yoghurt, cheese and/or alternatives, mostly reduced fat.

cereals Grains used for food, such as wheat and maize.

lean meat Meat with the least amount of fat possible.

Figure 4.4 A nutritionally balanced diet is crucial for a healthy body and mind.

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A well-balanced and healthy diet

In a healthy diet, it is important to ensure that we consume enough foods from each group every day. It is also important to include a variety of different foods from each of the groups so that we supply our bodies with all the nutrients they require to function, as well as to drink plenty of water and get sufficient exercise.

Tasty Trivia

Exercise is essential for good health and wellbeing; it is very important to do some sort of physical activity every day.

4.2 LET'S COLLABORATE

As a class, discuss the following questions:

1. How much water do you drink every day?
2. If you don't drink water, what do you drink? Why is this not a healthy choice compared with water?
3. What about exercise – did you do any today or this week?
4. How much exercise should we do each day/week? What are some of the barriers you face in ensuring that you get enough exercise?

Figure 4.5 Water and exercise are essential for maintaining both physical and mental health.

4.3 INVESTIGATE IT

Visit the Australian Government's Eat for Health website. Analyse the information on the section of the website titled 'Eating Well' and answer the following questions:

1. Explain the reason why it is hard for Australians to choose nutritious foods.
2. Check out the 'tips for eating well'. List five of these tips and complete the table to apply them to your own life.

Tips for eating well	How can I apply this tip so that I eat well?
1	
2	
3	
4	
5	

3. Which of these tips are you not able to apply to your own eating? Explain why.
4. Go to the section titled 'Healthy eating throughout all of life'. Explain the special food needs of an adolescent.
5. Discuss the importance of activity or physical activity in the life of an adolescent.
6. Browse the Eat for Health website. List five other useful pieces of information on the website.
7. Outline the reasons why this website is a trusted source of information.

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DESIGN BRIEF: PITA BREAD PIZZA

You are the coach of the Year 4 cross-country team from your local primary school. The members of the team will be at your school for lunch before they go to the interschool sports competition. They will be very hungry and will need a quick, healthy lunch that will help them to run fast.

Create a designed solution that could be eaten by the members of the team. When designing the quick lunch, think about the likes and dislike of primary school children, making sure to include at least one food from each of the key food groups.

Figure 4.6 Pita bread works well as a pizza base for a quick, healthy lunch item.

CREATE A SOLUTION

One of the members of the Year 4 cross-country team has just informed you that they are lactose intolerant. Research 'lactose intolerant' online and alter the healthy lunch item that you have designed to suit this dietary requirement.

4.4 ACTIVITY

A healthy choice SMS

Create reminder messages about healthy food choices that are quick and easy to follow. These messages are to be used by the Australian Government and will be sent to the general public via the SMS message service to mobile phones.

1 Unscramble the following healthy tips so the tips in the following sentences make sense:
   - **a** pasta cereals plenty Eat bread rice of and.
   - **b** foods each key food groups variety nutritional their values and of the for from Choose.
   - **c** amounts cheese fat alternatives best milk yoghurt low are Eat moderate of and.
   - **d** six eight water day per Drink to glasses of.
   - **e** amounts limited butter margarine and of Eat.
   - **f** per week One treat hurt you will not.
   - **g** life better exercise help build to a of and will for plenty body Remember nutrition good activity.
2 Using the tips that you have put into the correct order, develop three easy-to-read and effective SMSs using 'txt lingo' that could be used by the government to educate others about healthy eating.
3 Suggest what you could eat for lunch that includes at least one food from all the key food groups.

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REFLECT ON LEARNING

1. Explain why healthy food is so important to the human body.
2. Food provides us with a number of different nutrients. Explain the term 'nutrients'.
3. List 10 of the foods that would be included in a healthy and nutritious diet. Explain why this is so important.
4. Suggest why children and adolescents need to consume different foods.
5. Designing healthy food choices and then preparing them can be difficult for some people. Explain why this might be so.

4.3 Linking healthy eating to good health

It is important to ensure that we have healthy eating habits. The total amount of food that a person eats will depend on their sex, age, level of physical activity, body size and additional factors, such as whether a woman is pregnant or breastfeeding.

Healthy eating helps to ensure that we are able to maintain our optimal weight by balancing the amount of energy in terms of the food and drink we consume and the energy that is being used for physical activity. Good eating habits also help to reduce the risk of **diet-related diseases** such as **cardiovascular disease**, cancer, obesity and diabetes.

diet-related diseases Illnesses linked to quality of food consumption – for example, cardiovascular disease, colorectal cancer and constipation.

cardiovascular disease A class of disease that affects the heart and blood vessels.

To help you determine your risk of developing some of these health problems, it is useful to look at your family's medical history. This is called your biological determinant.

Figure 4.7 The amount of food our bodies require depends on our age and many other factors.

Tasty Trivia

According to a study by the Australian Institute of Health and Welfare into the effects of conditions that lead to bad health and premature death, diet-related issues are the leading risk factor.

Why is nutrition important?

Nutrition is the process of supplying the body with the requirements to sustain life. Nutrition is the reason why we need to eat food; it is the 'everyday' components of food that help our bodies to work. Food is made up of different types of nutrients that contribute to food being healthy for us to eat.

nutrition The science that studies the interaction between our bodies and food.

4.5 LET'S COLLABORATE

1. List the nutrients found in food.
2. State two foods that provide each of the nutrients listed above. Share your solution with a partner to develop a full list.
3. Do you take nutrient or vitamin tablets/supplements? With a partner, discuss the reasons why people take tablets/ supplements.

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What are nutrients?

Eating healthy foods ensures that our bodies take in a range of nutrients, which play an important part in keeping our bodies healthy. Nutrients are chemical compounds that are needed for growth, energy and health. The nutrient groups found in food include carbohydrates, proteins, fat, water, vitamins and minerals. On the following pages are summaries of the ways in which each of the nutrients helps to keep our bodies healthy.

Figure 4.8 Foods providing carbohydrates

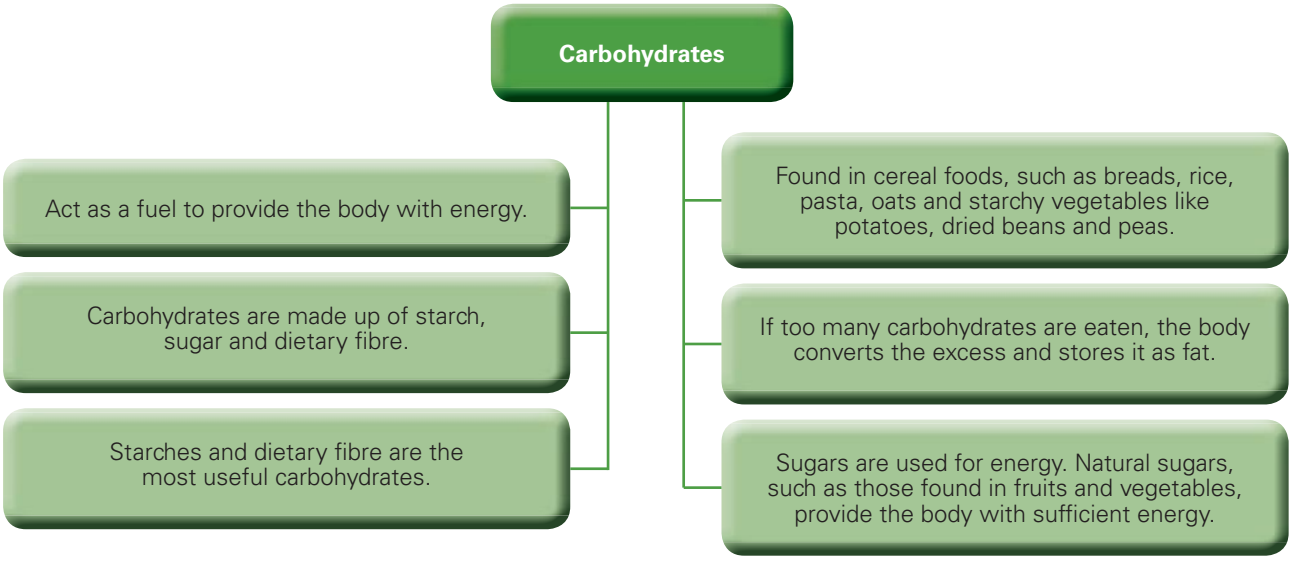

Figure 4.9 The function of carbohydrates

4.6 ACTIVITY

'Everyday' versus 'sometimes' carbohydrates

Copy and complete the table below to make a list of three 'everyday' carbohydrate foods and three 'sometimes' carbohydrate foods. Justify the reasons for your choices.

'Everyday' carbohydrate choices		'Sometimes' carbohydrate choices	
Choice 1		Choice 1	
Reason for choice		Reason for choice	
Choice 2		Choice 2	
Reason for choice		Reason for choice	
Choice 3		Choice 3	
Reason for choice		Reason for choice	

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4.7 LET'S COLLABORATE

Discuss with a partner the ways in which energy is used by the body. Develop a list of activities that require a large amount of energy.

4.8 LET'S COLLABORATE

What are legumes? In groups, list some examples of legumes. For each of the legumes you have listed, name a recipe in which it could be used.

Tasty Trivia

An adequate diet is one that provides all of the essential nutrients, allows growth and development of the body to proceed normally, maintains body weight and prevents diet-related diseases from occurring now and in the future.

Dietary fibre

- Dietary fibre is a very important carbohydrate. It performs many essential functions in the body.
- Dietary fibre is food that is derived from plants and not easily digested by the digestive system.
- We need fibre in order to assist the body's regulation of the bowels and prevent constipation.
- Dietary fibre also makes us feel full and helps to prevent some diseases, such as heart disease and some types of cancer.
- The best sources of fibre are wholegrain cereals, legumes, fruits, vegetables, nuts and seeds.

Figure 4.10 The function of dietary fibre

Fats

- Fats are fuels that provide energy to the body.
- Fats act as a layer of insulation to keep us warm and protect the body and its organs from injury.
- Many foods provide fat, but the major sources include butter, margarine, cooking oils, cheese, meat and some snack foods.
- If we eat too much food containing fat, the excess fat is stored in and on the body.
- The main groups of fats are saturated fat and unsaturated fat.

Figure 4.11 The function of fat

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complete protein food A food that contains all nine essential amino acids.

Protein

- Protein is one of the main ingredients that make up the cells in our bodies.
- It provides the materials necessary for growth, maintenance and repair of every cell in the body.
- Protein is an alternative source of energy if insufficient energy is provided by carbohydrates and fats in the body.
- Many foods contain protein, including meat, fish, poultry, eggs, milk, cheese and some vegetables and fruits.
- The best protein sources are animal products.
- A variety of protein foods is required by the body. We need to ensure we eat both **complete** and **incomplete protein foods**.

Figure 4.12 The function of protein

incomplete protein food Usually from plant sources that lack one or more essential amino acids.

Figure 4.13 Foods providing proteins

Vitamins

- These are only required by the body in small amounts, but are very important for normal growth and development.
- The body cannot make its own vitamins (except vitamin D), so they must be provided by the food we eat.
- Water-soluble vitamins include the B group vitamins and vitamin C.
- Fat-soluble vitamins include vitamins A, D, E and K.

Figure 4.14 The function of vitamins

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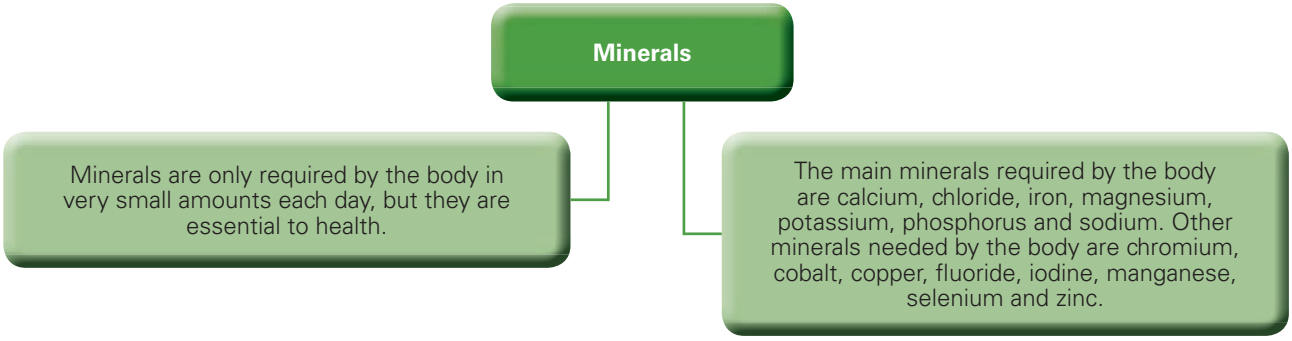

Figure 4.15 The function of minerals

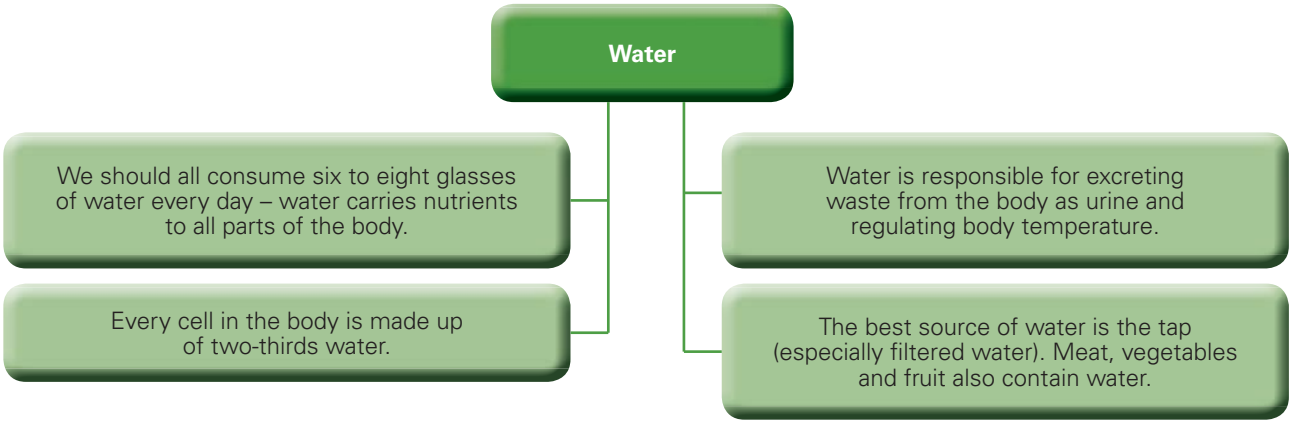

Figure 4.16 The function of water

Think ethically

What are some of the reasons why we should avoid purchasing bottled water?

Figure 4.17 Tap water in Australia is perfectly safe for drinking.

4.9 INVESTIGATE IT

Although it is really important to drink water, and the best water in Australia is tap water, drinking tap water in some countries can make people ill.

Access the Smart Traveller website to do the following:

1. Find five countries where it would not be safe to drink tap water. Explain the reasons why this is so for each country you select.
2. Outline the other information this site provides to assist travellers with healthy and safe eating while they are overseas.

DESIGN BRIEF: HEALTH BARS

There are many health bars available on the market. These are promoted as healthy snack options, but many are high in sugar and saturated fat, and low in dietary fibre. Some contain nuts, which can be a problem for allergy sufferers. The Crunchy Banana and Pineapple Bars recipe on p.96 aims to be a healthy snack choice. Design your own healthy bar.

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Crunchy banana and pineapple bars

RECIPE

Main tools and equipment

Lamington tray, measuring spoon, measuring jug, saucepan, food processor, bowl, whisk, oven

Production skills

Chopping, blending, beating, sifting, greasing, weighing

Cooking processes

Simmering, baking

MAKES 6

Preparation time: 35 minutes

Cooking time: 10 minutes simmering, 20 minutes baking

Serving and presentation time: 5 minutes

Total time: 70 minutes

Ingredients

 Cooking spray	 175 g dried banana, chopped	 175 g dried pineapple, chopped	 125 ml apple juice
 225 g butter	 80 g brown sugar	 3 tablespoons wholemeal flour	200 g rolled oats

Method

1. Preheat oven to 180°C.
2. Grease a lamington tray with cooking spray.
3. Place banana and pineapple into a saucepan with the apple juice and simmer for 10 minutes.
4. Allow the mixture to cool, then blend in the food processor (or you can use a potato masher or a sieve) until it is smooth.
5. In a bowl, beat together the butter and sugar until creamy, then gently stir in the flour and oats.
6. Spread half of the flour and oats mixture over the base of the lamington tray, then spread the banana and pineapple mix over the top. Spread the remaining flour and oat mixture on top and press down lightly.
7. Bake in the oven for approximately 20 minutes until the mixture is lightly golden.
8. Leave to cool, then cut into bars while still in the tray.

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4.10 ACTIVITY

Puzzling proteins

1 Investigate the difference between complete and incomplete proteins, and essential and non-essential amino acids.

2 Present the information in a graphical manner. Include images of food items to help show the differences.

4.11 ACTIVITY

Protein only, carbohydrate free

Diets free of carbohydrates, protein-only diets, powders and supplements are some of the many different diet regimes that are promoted for healthy eating and weight reduction.

1 Use all types of media sources – TV, magazines, newspapers and the internet – to find out about 10 diet regimes or products.

2 For each one, provide a statement evaluating whether it should be included in a healthy diet.

4.12 ACTIVITY

Presenting vitamins and minerals

1 Choose one of the vitamins or minerals required by the body. Explain the functions and food sources of your chosen vitamin/mineral.

2 Prepare a PowerPoint presentation to present this information to the class.

4.13 ACTIVITY

Facts on fats

Figure 4.18 Foods providing unsaturated fats

Fats are often limited in the diet because of the effect they have on the body.

1 Investigate the effects the following fats have on the body:
   - **a** polyunsaturated fats
   - **b** monounsaturated fats
   - **c** trans fats
   - **d** omega-3 fatty acids.

2 Using a computer, construct a diagram that outlines the effects of each of these fats on the body.

REFLECT ON LEARNING

1 Compare the terms 'nutrition' and 'nutrients'. Explain the differences in your response.
2 Develop a list of the reasons why nutrients are so important for the body.
3 Explain, in your own words, why healthy eating is vital.
4 Discuss the reasons why the body needs energy.
5 List the nutrients that provide energy.
6 Explain what happens to carbohydrates, proteins and fats that are not used by the body as energy.

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4.4 Foods for good health

When we choose foods to eat each day, a number of factors influence this selection. Most people do not choose foods just for their nutritional value. Our food selection is influenced by our family, peer group, **culture**, religion, personal likes and dislikes, types of foods available and the prices of different foods.

culture Beliefs, customs, traditions and social practices of a group of people.

A number of food-selection models have been developed in Australia to influence our food choices and to provide us with knowledge about choosing healthy foods. These models aim to help people choose the best foods for good health.

4.14 LET'S COLLABORATE

1. Consider the sorts of foods you choose to eat when you are at school.
2. List the factors that have an influence on these food choices.
3. Compare your list with a partner.

4.15 ACTIVITY

Sugar in soft drinks

How much sugar is in a bottle of soft drink? The answer is 12–15 teaspoons! That's a lot of sugar!

The standard serving size for soft drink has increased. A decade ago, soft drink came in 375 ml cans, yet now it is commonly sold in 600 ml bottles. This means you would exceed the recommended energy intake from refined sugar with just one bottle of soft drink.

Go in to the kitchen and measure 15 teaspoons of sugar. Use the electronic scales to calculate the weight of the 15 teaspoons of sugar.

1. How many bottles of soft drink do you consume in:
   - **a** a day
   - **b** a week?
2. How many teaspoons of sugar do you consume from soft drink in:
   - **a** a day
   - **b** a week?
3. Think about how you could reduce your sugar content from soft drinks. Make a list of alternative drinks that you could consume.
4. Use Google to help you investigate the quantity of sugar in a variety of drinks. Make a list, ranking these drinks from lowest sugar content to highest sugar content.

Figure 4.19 Soft drinks – liquid sugar!

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Tasty Trivia Over time, young people in Australia have become increasingly heavier – this is due to poor food choices, insufficient physical activity and/or the nutritional quality of the foods that are heavily promoted to them.

4.5 Food-selection models

Food-selection models are tools that people can use to help them select the types and sometimes the quantities of the various foods that the body needs to function properly.

There are a number of food-selection models available in Australia; they vary in terms of the amount and complexity of the information they provide. The different models have been developed for a different purpose and for a variety of different groups within the community. Two of the guides that will be discussed further here are the Healthy Eating Pyramid and the *Australian Guide to Healthy Eating*.

The Healthy Eating Pyramid

The Healthy Eating Pyramid is a simple visual guide to the types and proportion of the five core food groups that we should eat every day for good health.

This food-selection guide developed by Nutrition Australia contains five core food groups and healthy fats. These are included on the pyramid according to how much they contribute to a balanced diet. The Healthy Eating Pyramid is based on the 2013 *Australian Dietary Guidelines*.

Look at the picture of the pyramid in Figure 4.20 on p.100. You can see that it includes the following:

- vegetables, legumes, fruit and grains
- milk, yoghurt, cheese and alternatives, and the lean meat, poultry, fish, eggs, nuts, seeds, legumes food groups
- healthy fats.

The Healthy Eating Pyramid contains additional messages, including:

- enjoying herbs and spices
- selecting water as the drink of choice
- limiting salt and added sugar.

4.16 INVESTIGATE IT

Visit the Nutrition Australia website. Nutrition Australia provides fact sheets and resources that explain the ways in which young people can increase their intake of fruits and vegetables, eat healthy foods outside of the home and ensure that they eat healthily at breakfast time. Develop a dot point summary for each of these topics.

4.17 LET'S COLLABORATE

Discuss with a partner which diet-related diseases can be linked to foods high in salt and added sugar. Develop a list of these.

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Figure 4.20 The Healthy Eating Pyramid

4.18 LET'S COLLABORATE

Discuss the following questions with a partner, in a group or as a class:

1. What 'different foods' or foods from other cultures are represented in the Healthy Eating Pyramid?
2. How are cultural food restrictions affected by the information provided in the Healthy Eating Pyramid?

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4.19 ACTIVITY

Nutrition Australia

The Healthy Eating Pyramid in Figure 4.20 encourages Australians to enjoy a variety of foods from every food group, every day. Use the Nutrition Australia website to complete the following questions:

1. There are five core food groups in the Healthy Eating Pyramid. Identify and explain the foods that belong to each section.
2. Identify how the Healthy Eating Pyramid helps us to understand how a wide variety of foods can be included in the diet.
3. Thinking about nutrients, explain why food variety is so important.
4. 'Be active every day' is one of the messages promoted by the Healthy Eating Pyramid. List the ways by which you could move more each day. Here is an example to get you started:
   - walk to school instead of being driven.
5. Water gets a big green tick. Discuss the reasons why water should be included in the diet for optimal health.
6. Salt and added sugar get a big red cross. Make a list of foods that contain added salt and sugar. If you need help to complete this task, look at the labels of food products in the school pantry.
7. Look at the section of the website titled 'A brief history of the pyramid'. Explain how the 'pyramid' has evolved. Discuss the reasons for this.
8. The Healthy Eating Pyramid was last reviewed in 2015. Explain what the review decided and what implications this had for the Healthy Eating Pyramid.

Australian Guide to Healthy Eating

The *Australian Guide to Healthy Eating* was first developed in 1998 by the Children's Health Development Foundation and Deakin University for the Commonwealth Department of Health and Family Services.

This guide has also evolved over time and takes into consideration changing trends and a variety of cultures. It aims to encourage the community to eat a variety of foods from each of the key food groups every day, in proportions that are consistent with the *Australian Dietary Guidelines*.

4.20 INVESTIGATE IT

Visit the *Australian Guide to Healthy Eating* website and explain what you could do to eat more healthily.

Look at the diagram of the *Australian Guide to Healthy Eating* in Figure 4.21 on p.102 and see whether you can make out the five different sections of the plate. The size of each of the segments of the plate is an indication of the amount of these foods that we should consume daily:

- Eighty per cent of the food we eat should come from plant foods: breads, cereals, rice, pasta, noodles, vegetables, legumes and fruit.
- Twenty per cent of the food we eat should come from animal foods (or non-animal substitutes): milk, yoghurt, cheese, meat, fish, poultry and eggs, and/or nuts and legumes.
- 'Sometimes' or 'in small amounts' foods are extra foods that should only be eaten occasionally or in very small amounts.

The *Australian Guide to Healthy Eating* also promotes the consumption of plenty of water.

The *Australian Guide to Healthy Eating* has been adapted to create a food-selection model for Aboriginal and Torres Strait Islander peoples – the *Aboriginal and Torres Strait Islander Guide to Healthy Eating*.

Eat different types of foods from the five food groups every day.

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Figure 4.21 *The Australian Guide to Healthy Eating*

4.21 INVESTIGATE IT

Visit the Eat for Health website and view the *Aboriginal and Torres Strait Islander Guide to Healthy Eating*.

Compare this healthy eating guide with the *Australian Guide to Healthy Eating*. Explain the similarities and differences.

Explain the importance of recognising the difference in food consumption for Aboriginal and Torres Strait Islander peoples.

Discuss why the 'only sometimes' and 'in small amounts' categories exist in this food guide and why the items that appear here are so different from those in the *Australian Guide to Healthy Eating*.

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4.22 ACTIVITY

Understanding the *Australian Dietary Guidelines*

Visit the National Health and Medical Research Council website to find out more about the *Australian Dietary Guidelines* and then complete this activity.

1. Each student is to investigate one of the dietary guidelines that relates to food consumption and then present their findings to the class in the form of an oral PowerPoint presentation. Your presentation should include the following information:
   - the name of your chosen guideline
   - an explanation of why this guideline is so important to Australians or children and adolescents
   - a list of the nutrients to which this guideline refers
   - a list of five tips that could be used to follow this guideline
   - a list of foods that need to be included in the daily diet if we are to follow this guideline properly
   - a recipe that promotes your guideline.
2. Compare the messages about food and nutrition provided by the *Australian Guide to Healthy Eating* with the messages provided in the *Australian Dietary Guidelines*.
3. Check out the *Australian Guide to Healthy Eating* fridge magnet. Develop your own magnet to encourage you to be a healthy eater.

CREATE A SOLUTION

1. Work in a group of three to find at least five recipes each that promote the healthy eating messages contained in one of the food-selection guides discussed in this chapter.
2. Spread the 15 recipes out on the table and rank the recipes from 1 to 15 (with 1 being the best recipe and 15 being the least appropriate recipe) according to their ability to promote the message of the food-selection guides.
3. Make a group decision about the best recipe – consensus must be reached.
4. Prepare a food order using the table below – be sure to include quantities.
5. Prepare the recipe in class time.
6. Reflect on your decision-making process once you have taste-tested your food item.
7. Describe your thoughts about the ability of the group to reach a consensus, the overall cooperation of all group members and the taste and suitability of your food item.

Food order

Butcher	Greengrocer	Supermarket

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Spelt pancakes

RECIPE

Main tools and equipment

Bowl, measuring cup, measuring spoons, saucepan, microwave-proof bowl, non-stick frying pan, spatula

Production skills

Combining, stirring

Cooking processes

Frying, warming

MAKES 6

Preparation time: 35 minutes

Cooking time: 10 minutes

Serving and presentation: 5 minutes

Total time: 50 minutes

Ingredients

 ¾ cup spelt flour	 ¼ teaspoon cinnamon	 ¼ teaspoon nutmeg	 1 egg, beaten	 ½ tablespoon honey	 1 cup coconut milk
 1 teaspoon vegetable oil	 ¼ cup blueberries or mixed berries	 ½ teaspoon icing sugar for serving			

Method

1. Combine the flour and spices in a bowl.
2. Make a well in the middle. Add the egg and the honey to the hollow.
3. Warm the coconut milk in the microwave or in a saucepan.
4. Using a wooden spoon, gradually stir in the milk.
5. Allow to stand for 10 minutes (if possible) to soften the flour.
6. Heat vegetable oil in a non-stick frying pan over a medium to low heat. Using a large spoonful of batter for each pancake, cook the pancakes in batches, adding a little more oil to the pan as needed.
7. Fry the pancakes until golden brown, 1–2 minutes for each side. Keep the pancakes warm on a plate covered with a clean dry tea towel until you are ready to serve them.
8. Serve 3 pancakes stacked on a plate. Place berries on top and sprinkle with icing sugar.

Evaluating

1. List the aspects of this task that you found difficult.
2. Explain how you could have improved on your recipe and your organisation if you were to repeat this task again.
3. Analyse the appearance, aroma, taste and texture of your spelt pancake
4. Investigate two other recipes suitable for breakfast. Prepare them at home and critically evaluate them in terms of suitability for breakfast before school.

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4.23 ACTIVITY

Eat healthily and break the fast

Breakfast is the most important meal of the day – often we forget or just choose not to eat breakfast, even though it 'breaks the fast' after the body has gone for perhaps 10 to 12 hours without food. People who have a good, healthy breakfast work and concentrate better than those who do not. Figure 4.22 shows an example of a healthy breakfast.

Figure 4.22 A healthy breakfast

1 Copy and complete the table below to identify:
   - **a** the food group to which the food item belongs
   - **b** the section of the Healthy Eating Pyramid to which the food item belongs
   - **c** the section of the *Australian Guide to Healthy Eating* to which the food item belongs
   - **d** two nutrients found in that breakfast food item.

Healthy breakfast item	Food group	Section of the Healthy Eating Pyramid	Section of the *Australian Guide to Healthy Eating*	Two nutrients found in this breakfast item
Glass of skim milk				
Bowl of cornflakes with skim milk				
Poached egg				
Mushrooms				
Multigrain toast with low-fat margarine				
Glass of water				

2 Discuss how this breakfast provides a variety of foods.

3 Explain how this breakfast complies with the Healthy Eating Pyramid and includes foods in the correct proportions.

4 Look back at the *Australian Guide to Healthy Eating* and explain how this breakfast includes the proportions suggested by this food-selection model.

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4.23 ACTIVITY – continued

5 Let's compare your own breakfast. Copy and complete the table below, this time writing down what you eat for breakfast.

Healthy breakfast item	Food group	Section of the Healthy Eating Pyramid	Section of the *Australian Guide to Healthy Eating*	Two nutrients found in this breakfast item

6 Complete the four analysis questions again, but this time analyse your own breakfast.

7 Make a list of suggested improvements or changes that you could make to your own breakfast.

4.24 ACTIVITY

Pack a lunch

Lunch is usually a light meal that needs to sustain us until dinnertime. Your lunch at school may be either bought at the canteen or prepacked at home.

1 Describe the lunch that you ate today.

2 Where did this lunch come from?

3 Use the knowledge that you have gained from this chapter to explain how healthy and balanced this meal was. Consider the food groups, the *Australian Guide to Healthy Eating* and the nutrients when completing your answer.

4 Use this information to plan a packed lunch that you could take to school.

5 Use this information again to write a letter to the school canteen explaining how and why it could change the food it serves.

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REFLECT ON LEARNING

1. Identify the aim of the food-selection models.
2. List the five core food groups of the Healthy Eating Pyramid.
3. 'Move more' promotes the importance of ….
4. Discuss how the *Australian Guide to Healthy Eating* encourages the consumption of a wide variety of foods.
5. Copy and complete the table below to list what the differences and similarities are between the Healthy Eating Pyramid and the *Australian Guide to Healthy Eating*.

Differences	Similarities

DESIGN BRIEF: PANCAKE STACK

Breakfast is a very important meal – it breaks the overnight fast and keeps us going until morning tea or lunchtime. The Pancake Stack is an ideal meal to do just that.

Develop your own breakfast pancake stack that is quick and easy to prepare. The pancake stack must contain at least three different fruits from different colours of the rainbow; it should be low in sugar and it should keep you going until morning tea time.

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LOOKING BACK

1 Food nourishes our bodies and helps to reduce the risk of diet-related diseases and other health problems.

2 A balanced diet provides the body with carbohydrates, protein, fats, vitamins, minerals and water so it can function efficiently.

3 The key food groups are:

- vegetables and legumes/beans
- fruits
- grain (cereal) foods, mostly wholegrain and/or high cereal fibre varieties
- lean meats and poultry, fish, eggs, tofu, nuts and seeds, and legumes/beans
- milk, yoghurt, cheese and/or alternatives, mostly reduced fat.

These are the basis of many food-selection models.

4 Each nutrient has a specific function in the body. We should therefore ensure that we consume a variety of foods in the recommended proportions.

5 Food-selection models are tools to help people choose the correct foods in the correct proportions. Two examples of these are the Healthy Eating Pyramid and the *Australian Guide to Healthy Eating*.

TEST YOUR KNOWLEDGE

Multiple choice

1 When eating a well-balanced diet, foods should be from the:

a nutritional food groups

b key food groups

c balanced food groups

d healthy eating groups of food.

2 There are a number of different nutrient groups found in food; these include:

a starches, dietary fibre, water and carbohydrates

b saturated fat, carbohydrates, protein and dietary materials

c vitamins, minerals and vanilla

d carbohydrates, protein, fats, water, vitamins and minerals.

True/false

1 Ill-health is best avoided by eating nutritious food.

2 The body does not need vitamins for good health.

3 Nutrition is the process of supplying the body with the requirements to sustain life.

Short answer

1 Look at the picture on the cover of the *Australian Guide to Healthy Eating* and describe the information that it provides using your own words.

2 Explain the purpose of the *Australian Guide to Healthy Eating*. In your explanation, discuss the area of health it is meant to improve.

3 Energy is required for everyday activities and for growth and development. Which nutrient provides energy? Describe a nutritious breakfast that would provide energy to begin the day.

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Extended response

Read the passage about soft drinks and answer the questions that follow.

Summer soft drink health warning

The latest research is showing that consuming 340 ml of sugary drink a day (which equates to less than one can) increases your risk of type 2 diabetes by 22% when compared with drinking one can a month or less.

Sugary drinks, or sugar sweetened beverages, include all non-alcoholic water based beverages with added sugar such as non-diet soft drinks, energy drinks, fruit drinks, sports drinks and cordial.

Sugar sweetened beverages are high in kilojoules, leading to weight gain and obesity. Obesity has been shown to be a leading risk factor for type 2 diabetes, cardiovascular disease and some cancers (including endometrial, oesophageal, renal, gallbladder, bowel and postmenopausal breast cancers).

Young Australians are the highest consumers of sugar sweetened beverages, and sugar sweetened soft drinks in particular. The 2007 Australian National Children's Nutrition and Physical Activity Survey found that 47% of children (2 to 16 years of age) consumed sugar sweetened beverages (including energy drinks) every day.

Figure 4.22 Despite research proving that water is the best drink option, many households still allow children to consume sugary drinks.

The level of consumption peaked among 14 to 18 year-olds, with 51% of males and 38% of females in this age group consuming a soft drink on the day prior to interview.

In the 12 months to October 2012, Australians bought 1.28 billion litres of carbonated/still drinks with sugar, with regular cola drinks being the most popular (447 million litres).

American estimates show that consuming one can of soft drink per day could lead to a 6.75 kg weight gain in one year (if these calories are added to a typical US diet and not offset by reduction in other energy sources).

Many drinks contain acid that harms your teeth, including regular and diet soft drinks, sports/energy drinks and fruit juices. Acid weakens tooth enamel which can lead to tooth decay. Tooth decay is the most prevalent disease in Australia.

Sugar sweetened beverages produce more acid when the sugar combines with bacteria in the mouth. Try drinking natural spring water instead – it has no acid, no sugar, no kilojoules, as well as many other added health benefits.

Source: www.aussienatural.net.au/news/summer-soft-drink-health-warning.

1. Soft drinks are high in sugar. Discuss a better drink to quench your thirst. Justify your choice of drink.
2. Explain the health problems associated with the sugar found in soft drinks.
3. Discuss the population group in Australia that is most likely to be at risk. List the issues for these people.
4. List the reasons why health experts are calling for warnings to be printed on soft drink labels. Do you agree with this? Explain the reasons why or why not.
5. In many school canteens, lollies and foods high in fat have been banned. Suggest a list of foods that could replace lollies and fatty foods at school.
6. Suggest how the Healthy Eating Pyramid could be used by school canteens to promote healthy food consumption.

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CHAPTER 5

Fruits and vegetables

ACCESS PRIOR KNOWLEDGE

1. Is a tomato a fruit or a vegetable? Justify your response.
2. For good health, you should 'eat a rainbow'. Outline what this means.
3. Explain the best way to prepare and cook vegetables to make the most of their nutrients.
4. Describe the physical, sensory and chemical properties of an apple.
5. Discuss the pros and cons of having seasonal fruits and vegetables available in supermarkets all year long.

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5.1 Do you know your fruits from your vegetables?

Fruits and **vegetables** are the edible parts of plants. Fruits contain the seeds of plants and are attached to the plant by a stem or stalk. Vegetables can be many different parts of the plant and grow in a large variety of ways.

fruits The edible parts of a plant that contain the seeds of the plant and are attached to the plant by a stem or stalk.

vegetables The edible parts of a plant. There are many different vegetables, and we eat different parts of the plant.

botanical Relating to plants and/or plant life.

Some vegetables are in fact **botanical** fruits, such as tomatoes, zucchini and eggplants. A significant difference between fruits and vegetables is that the carbohydrate in fruits is mainly sugar, whereas the carbohydrate in vegetables is mainly starch. Fruits are generally sweet and served as desserts, while vegetables are treated as savoury foods.

Tasty Trivia

In some cultures, avocadoes are used in desserts. In Vietnam, Sinh To Bo is an avocado milkshake. A similar drink in Indonesia, an avocado shake with chocolate, is called Jus Alpukat.

Figure 5.1 Sinh To Bo

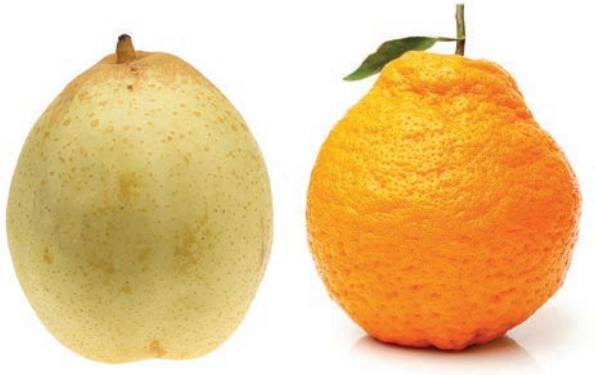
The ease with which fruits and vegetables can cross-breed has led to the development of many new fruits, and we will no doubt continue to see more developed in the future. The accidental **cross-pollination** of two apples produced the famous Australian Granny Smith apple.

cross-pollination The transfer of pollen from one plant to another.

5.1 LET'S COLLABORATE

Do you know what was produced by the crossing of a plum and an apricot? Which two fruits resulted in the nashi? Discuss other **hybrid** fruits with the person beside you. Can you think of any hybrid vegetables? Jump on Google and see whether you can add any more hybrids to your list.

hybrid An object that combines two different elements.



Nashi Tangelo

Pluot

Figure 5.2 Do you recognise these hybrid fruits?

History of fruits and vegetables

The first forms of vegetables were wild plants eaten by hunter-gatherer tribes, who did not cultivate crops. They included edible roots, greens, nuts and berries. There is evidence of cultivation of fruit dating back over 8000 years. The first known fruits were apples and berries, such as strawberries and raspberries. References to food crops and the value of agriculture also occurred over 3000 years ago.

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Hummingbird cupcakes

JAMAICA

RECIPE

Main tools and equipment

Knife, measuring spoons, measuring cups, fork, muffin tray, electric beaters

Production skills

Mashing, sifting, folding

Cooking process

Baking

MAKES 12 CUPCAKES

Preparation time: 20 minutes

Baking time: 25 minutes

Icing time: 15 minutes

Total time: 60 minutes

Ingredients

 ⅔ cup self-raising flour	 ⅓ cup plain flour	 ½ teaspoon bicarbonate of soda	 ½ teaspoon ground cinnamon	 ½ cup brown sugar	 ⅓ cup desiccated coconut
 10 g butter	 1 small ripe banana, mashed	 2 eggs	 ⅓ cup crushed pineapple	 12 patty pan cases	

Icing

 60 g cream cheese	 1 teaspoon vanilla essence	 1½ cups icing sugar

Method

1. Preheat oven to 160°C.
2. Line a muffin tray with 12 patty pan cases.
3. Sift flours, bicarbonate of soda and cinnamon into a large bowl.
4. Stir in sugar and coconut.
5. Add eggs, butter, banana and pineapple. Stir until just combined.

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6 Spoon into patty pan cases.
7 Bake for 25 minutes or until cakes spring back when gently touched.
8 Allow to cool on cake cooling rack.

Icing

1 Use electric beaters to beat cream cheese and vanilla until smooth.
2 Gradually add icing sugar until smooth.
3 Spread icing over cakes.

Evaluating

1 Evaluate the sensory properties of the dish.
2 Describe the role of the pineapple in these cakes.
3 Research the history of the hummingbird cake. What is the origin of its name?
4 Explain why these cakes are a 'sometimes' food, even though they contain fruit.
5 Analyse your effectiveness in the process of food preparation. Reflect on the production activity that you have just carried out. Complete the following sentences:
   a 'My strength today was …'
   b 'What I can do to improve is …'
   c 'I encouraged and supported other students today by …'
   d 'I concentrated on the task today, particularly when I was …'
   e 'I learnt the following new skills …'

Figure 5.3 Figs, quinces and pomegranates are mentioned in the Bible, the Talmud and the Qur'an.

Figure 5.4 Scurvy is caused by severe vitamin C deficiency.

The pyramids in Egypt have revealed evidence of onions, garlic, beans and radishes growing in that society. Vegetables were often the main source of food when meat was in short supply. As the ability to travel between countries increased, excesses of food crops were taken to other countries and this increased the variety of vegetables available.

The importance of fruit to maintain good health became evident when explorers started to travel on long sea voyages with a limited range of supplies on board. The sailors suffered from a disease called scurvy, which is caused by a lack of vitamin C. Many people died because, even when they began to suspect it was due to a lack of fruit and vegetables, these could not be kept fresh for long periods on ships. Carrying lemon or lime juice as part of a sailor's rations helped solve the problem. Another solution was pickled cabbage (sauerkraut), especially when lime juice was used in the pickling process.

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5.2 Traditional Aboriginal and Torres Strait Islander foods

For over 50 000 years, Aboriginal and Torres Strait Islander peoples have gathered many different types of native fruits and vegetables growing wild in Australia. There are plenty of native fruits and vegetables available, as long as you know when, where and how to find them. Depending on the season, some interesting finds include finger limes, bush bananas, wild watermelon, yams, wild grapes, pink beach apples, billygoat plums (complete with 50 times the amount of vitamin C of oranges), cockle berries, water lilies, wild beans and nuts.

Tasty Trivia

Many years ago, explorers used hollowed-out watermelons to carry water on long expeditions.

5.3 Structure of fruits: Physical properties

The classification of fruit is based on common characteristics between fruit. This may be structural – for example, apples and pears – or where they are grown, such as tropical fruit. How fruit is classified can vary, as some fruits may fit into more than one group or category.

Figure 5.6 Which of these tropical fruits do you like best?

Boab pod

Zamia palm seeds

Finger limes

Figure 5.5 These are examples of fruits native to Australia. Zamia palm seeds need to be treated before they are eaten, as they are poisonous when eaten raw.

DESIGN BRIEF: NATIVE AUSTRALIAN INGREDIENTS

You have been asked to prepare a recipe for a Western Australian travel company that uses an ingredient native to Australia. They plan to showcase your recipe and the food that you have made at a travel expo to be held at the weekend. Use the internet to locate a recipe that contains a native Australian fruit or vegetable and then research where and how you can purchase this fruit or vegetable.

Work with your teacher to purchase the ingredient and prepare the recipe. Evaluate and analyse the recipe in terms of:

1. ease of purchasing the ingredient
2. cost of the ingredient
3. length of time to actually get the ingredient delivered
4. sensory properties – appearance, aroma, taste/flavour and texture.

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5.2 LET'S COLLABORATE

What do you know about fruit classification? The table below is about classification and is partly completed.

1 Working in groups, copy the table into your notebook or onto your computer and complete it. Where only one example is given, suggest at least two more.

2 Identify any fruits that do not fit into these groups.

Classification	Description of the common characteristics	Examples
Citrus	The part most commonly eaten is the soft and juicy segments. The fruit is covered in a thin, fragrant, shiny rind over a white pith. The rind is often used in food preparation. Some citrus fruits are sour and some are sweet.	Mandarins, tangelo
Pomes		Apples, pears
		Pineapples, bananas, mangoes
Stone or drupes	One stone in the centre of the fruit surrounded by soft, sweet flesh and a thin skin that can be eaten. Often eaten raw, but can also be cooked.	
Vines		Grapes
Melons		Rockmelon
	Small summer fruit, often deep red or purple in colour; the seed is often on the outside. They make tasty jams, but are also eaten raw.	
Tropical		

Figure 5.7 Classification of fruit

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5.4 Primary production of fruit

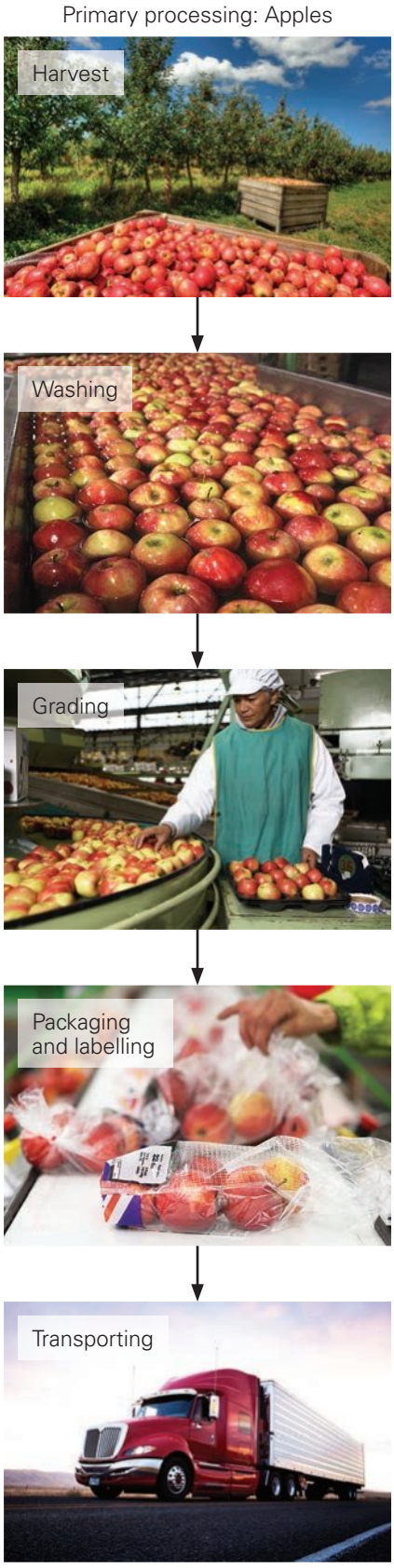

Figure 5.8 The primary steps in processing fruit.

5.5 Sustainable practices for fruit

Fruits and vegetables are cheaper and at their best when purchased in season, and Australia is well known for its fresh and tasty fruit. But when you visit the supermarket you are always able to purchase fruits out of season because they are imported from other countries – for example, oranges from Spain, cherries from the United States, blueberries from New Zealand and coconuts from Samoa. Why do we have out-of-season non-local fruits in our supermarkets and should we buy these? If we purchase locally grown Australian fruits and vegetables, it creates jobs and boosts our economy. Australia has the resources to produce enough fresh food to feed everyone, so do we really need to import fruits and vegetables from other countries?

Many people choose not to buy foods out of season because of the effects on our local farmers and environment. Imported fruits and vegetables have a high carbon footprint, travelling a number of **food miles** before hitting our stores and tables. So how important is it to be able to eat cherries all year round? Only you can be the judge of that.

food miles The distance food products travel from where they are produced to where they are purchased and consumed.

5.6 Best-quality fruits: Sensory properties

When buying fruit, you need to look out for indications of quality (see Figure 5.9).

Fruits should be stored carefully to maintain their properties. Most fruits are best kept in the fridge below 5°C to ensure the longest shelf life possible once they have ripened. Remember to wash your fruit, but only immediately before you are about to eat it.

Tasty Trivia

Bananas hate being stored in the fridge; they like to be kept at room temperature. The cold temperature causes the discoloration of the flesh. Put one in the fridge at home for the next few days and check this for yourself!

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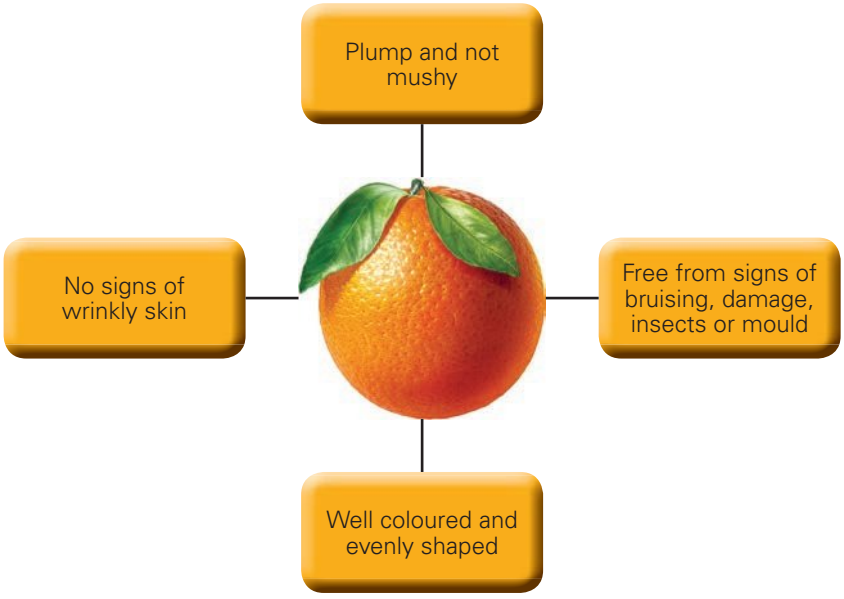

Figure 5.9 The characteristics of high-quality fruit.

5.3 ACTIVITY

Comparing fruit

1. Compare different fruits in a series of Venn diagrams. Use the example below to get started.
2. Complete a Venn diagram for two fruits – for example, pears and apricots.
3. Complete a Venn diagram for three fruits – for example, Granny Smith apples, cherries and strawberries.

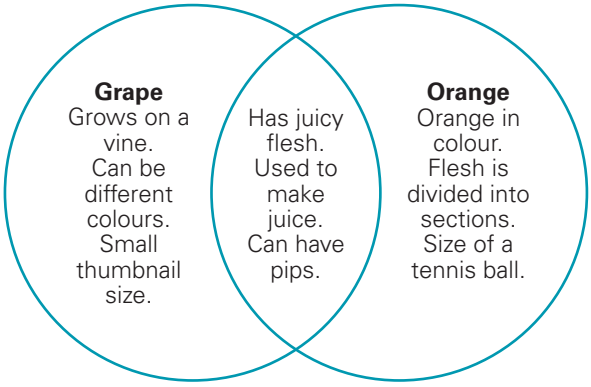

Figure 5.10 Comparing grapes and oranges

5.7 Nutritional value: Chemical properties

For most of us, fruits and vegetables are an everyday part of our diet – although probably not in the amounts that nutritionists recommend.

What fruits and vegetables should you eat? A simple suggestion is to consume the rainbow for the best mix of nutrients provided by fruit and vegetables. If you mix the colours, you will naturally be eating a mix of essential vitamins and minerals. Mix as many colours as possible at every meal; the deeper the colour, the higher the nutritional value.

A kiwifruit contains twice as much vitamin C as an orange.

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The value of eating plant foods is becoming more and more apparent. When people refer to fast food, they are usually referring to hamburgers or fish and chips, but what could be faster than an apple or celery stick? Let's look at a few natural 'fast foods'.

Bananas offer:

- a biodegradable package
- flexibility in how they can be processed
- flexibility in how they can be prepared
- many different ways of serving
- long-lasting energy.

Carrots offer lots of vitamins, minerals and dietary fibre.

The variety of fruits and vegetables available means it is easy for them to be part of our everyday diets.

Figure 5.11 Bananas and carrot sticks are perfect for eating on the run.

Some interesting fruit and vegetable facts include:

- Fruits and vegetables provide many vitamins and minerals.
- They add carbohydrates to the diet in the form of dietary fibre, starch and sugar.
- They are a source of incomplete protein.
- Different colours of fruits and vegetables are broadly linked to the different nutrients.
- Combinations are essential to get all the benefits.
- Vitamin C is usually associated with green leafy vegetables, and with orange and red fruits and vegetables.
- Vitamin A is usually associated with yellow and green leafy vegetables as well as green and yellow fruit.
- White, cream and yellow vegetables are often high in carbohydrates such as starch, sugars and dietary fibre.
- Combinations are important because they help to absorb the good minerals such as potassium, iron, iodine and magnesium.
- The nutrient content changes as fruits and vegetables ripen.

Tasty Trivia

Black or really ripe bananas used to be the favoured energy food for marathon runners and cyclists because they are an instant source of glucose or energy that the body can use without digestion. Today, athletes use manufactured sources of glucose.

5.4 INVESTIGATE IT

Have a look on the Nutrition Australia website for information about packing a lunchbox.

1. Analyse the contents of your lunchbox – does it contain enough fruits and vegetables?
2. Now think about what you had for dinner last night. How was this meal in terms of nutrition?
3. Set yourself an improved lunchbox challenge for one week, reflecting the needs identified from your analysis.

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5.5 LET'S COLLABORATE

Working with a partner, name one fruit and one vegetable for each colour of the rainbow – red, orange, yellow, green, blue, indigo, violet. Select different fruits and vegetables from those in Figure 5.12.

Figure 5.12 Choose fruits according to the colours of the rainbow to ensure you eat a balanced variety.

5.6 LET'S COLLABORATE

1. Record all the fruits and vegetables that you consumed yesterday. Don't forget to include processed fruits or vegetables such as sultanas in muesli, potato crisps or fruit juice.
2. Create a class list.
3. As a class, categorise the fruit, creating a 'target for top foods'. Using the dartboard model (see Figure 5.13), place them into categories: fresh, partly processed, highly processed.
4. Reflect on the information provided in your target. Prepare a list of your top five recommendations for your class based on the information presented.
5. Write an article that could be used on your class or school blog, including your recommendations and the reasons behind these.

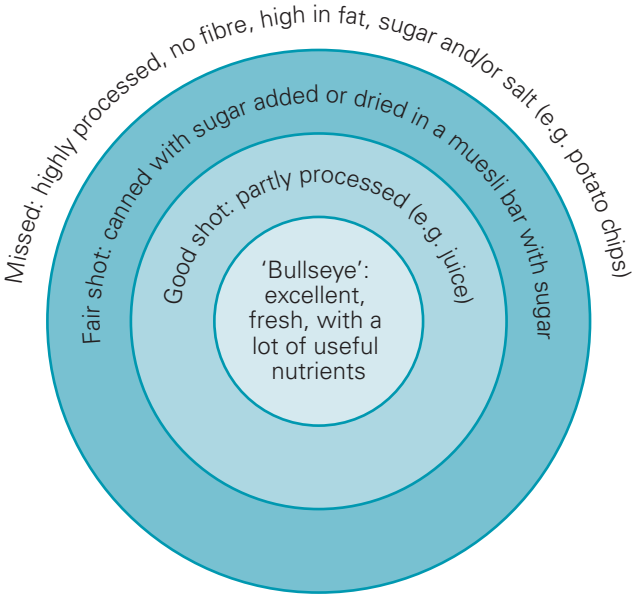

Figure 5.13 Target the bullseye for best value in fruit and vegetables.

Tasty Trivia

Are you getting enough? Fewer than 4 per cent of Australians eat enough vegetables every day. The average Aussie only eats half the recommended amount. What vegetables have you eaten today? You had better get munching!

CREATE A SOLUTION

Are you getting enough of the right food each day? List the fruits and vegetables you have eaten in the last week.

Design a meal plan that will ensure you increase the amount of fruits and vegetables you are eating every day, swapping out the 'sometimes' foods for 'everyday' foods. See whether you can stick to your new meal plan.

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Get the best from the rainbow

When preparing and cooking fruits and vegetables, it is important to prepare food in a way that optimises its nutritional value.

Unfortunately, the nutrients associated with fruit and vegetables can be lost in food preparation and processing. What were once excellent sources of taste, colour, texture and nutrients can be spoilt by inappropriate preparation and cooking techniques. Consider the following:

- Boiling results in the loss of some water-soluble vitamins, so steam where possible.
- Cook fruits and vegetables as whole as possible to preserve nutrients.
- Slice just before serving to preserve nutrients.
- Fruit and vegetable skins and the area just below the skin are nearly always packed with nutrients, so try to keep the skin on.
- Don't soak fruits or vegetables before serving or cooking.
- Try to eat fruits and vegetables as fresh as possible for maximum nutrients.
- Processing methods used for preservation do not always remove all nutrients. For example, frozen fruit and vegetables are picked fresh and frozen quickly.

REFLECT ON LEARNING

1. Outline why an avocado is a vegetable – a fruit vegetable, but classified as a vegetable.
2. It is important to eat the rainbow. Explain why this is so.
3. Describe one preparation technique that will result in the retention of nutrients when cooking.
4. Identify one cooking technique that will result in the loss of nutrients.
5. It is often said that 'fresh is best'. Do you agree with this statement? Justify your response.

5.7 ACTIVITY

A fruit quiz

Create an online quiz (like Kahoot) with facts about a fruit to test the fruit knowledge of other students in the class. The facts should go from the hardest to the easiest. Set up the quiz so that students score points according to how few facts they need before they guess the correct answer.

Here is an example:

1. Until the nineteenth century they were considered poisonous in Argentina.
2. About 9.4 kg are consumed each year in Australia (about 500 g per person).
3. The fruit is covered in tiny seeds, rather than the seeds being in the centre.
4. They are a member of the rose family.
5. Australia's most popular berry fruit.

5.8 Cooking with fruit

Fruits can be cooked whole or in large portions, referred to as a **compote**; stewed, baked, mashed up or in a **purée**; or left raw.

compote Fruit stewed or cooked in a syrup, usually served as a dessert.

purée To blend, process, sieve, mash and/or strain cooked food to the consistency of a soft paste or thick liquid.

You will be familiar with fresh fruit in dishes such as fruit platters and fresh fruit salads, which require minimal preparation. Fruit is also available dried, canned and frozen.

In Australia, fruit is most often associated with sweet dishes. However, in other cultures, such as Middle Eastern societies, many meat dishes, such as tagines, contain dried fruit – like dried apricots, prunes, dates or sultanas. In Asia, sweet and sour dishes require the addition of a fruit such as pineapple to provide the sweet element of the dish.

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Figure 5.14 Next time you make a savoury salad, add a fruit – you will be amazed at how well fruit can work in salad.

5.8 LET'S COLLABORATE

Can you think of other countries with traditional dishes that include fruit? In pairs, list as many as you can.

Check out apples

Apples are associated with many myths, legends and fairy tales. The apple is the most popular fruit in Australia. The best loved older varieties are Granny Smith and Red Delicious, and the most popular new varieties are Royal Gala and Australian Fuji. Many varieties are available to suit a range of tastes and food-preparation situations.

DESIGN BRIEF: NEW FRUIT HERO

1. Choose a fruit with which you have not worked before.
2. Design a product that will showcase this fruit as the 'hero', and thus encourage more people to try it.
3. Prepare a sensory analysis card that you can give to people who taste your final product. Include a tasty trivia fact about the piece of fruit with which you are working.

5.9 ACTIVITY

Test your tastebuds

There are many different varieties of apples – have you thought about the differences in taste, texture or appearance? Are all apples the same?

1. Select four different apples that are in season at the same time, one classified as a cooking apple, such as a Granny Smith, and the others classified as eating apples, such as Royal Gala, Pink Lady and Jonathan.
2. Brainstorm words that could be used to describe the taste, texture and appearance of apples – for example, sour, soft.
3. Give an opinion about each apple. Select the preferred apple. Justify your choice based on the properties of the apple.

The Apple and Pear Crumble on p.122 is a good dessert as it has a low **glycaemic index (GI)**, which means that not only is it tasty, but unlike most desserts, you feel full for some time after you have eaten because it breaks down slowly and takes some time to digest.

glycaemic index (GI) The ranking of carbohydrates according to their effect on our blood glucose levels.

Tasty Trivia Apples are able to float on water because they contain air.

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Apple and pear crumble

ENGLAND

RECIPE

Main tools and equipment

Knife, spoon, measuring spoons, measuring cup, zester, ramekins, bowl

Production skills

Coring, peeling, chopping, rubbing in

Cooking processes

Simmering, baking

MAKES 12 PORTIONS

Preparation time: 30–40 minutes

Cooking time: 20–30 minutes

Serving and presentation time: 5 minutes

Total time: 55–75 minutes

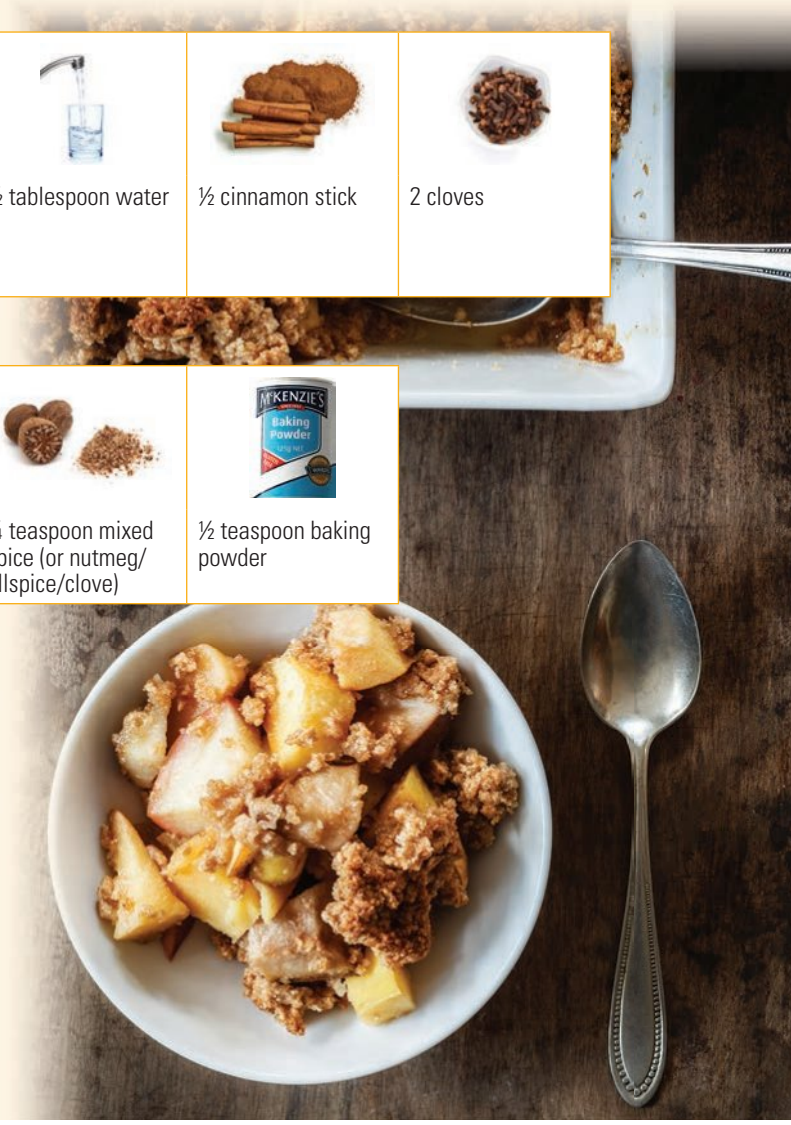
Ingredients

Filling

 1 Granny Smith apple	 1 Packham pear (firm)	 30 ml grape or apple concentrate (available in health food stores)	½ tablespoon water	½ cinnamon stick	2 cloves

Crumble

 3 tablespoons wholemeal flour	 3 tablespoons plain flour	 ¼ teaspoon cinnamon	¼ teaspoon mixed spice (or nutmeg/ allspice/clove)	½ teaspoon baking powder
 40 g butter	 1 tablespoon rolled oats	 1 tablespoon grape or apple concentrate or honey or brown sugar to bind		
 ¼ cup shredded coconut	 1 tablespoon slivered almonds	 1 small lemon (zest only)		



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Method

1. To make the filling, peel, core and chop the apple and pear.
2. Place the apple and pear into a saucepan with the grape or apple concentrate, water and whole spices. Simmer on medium heat until apples are tender but not mushy. Take out spices.
3. Place the apple mix into individual ramekins.
4. For the crumble, mix together flours, spices and baking powder.
5. Rub in butter until mixture is crumbly.
6. Mix in rolled oats, juice concentrate (or honey or brown sugar), coconut, almonds and lemon zest until it clumps together a little.
7. Add a thick layer of crumble over the top of the apple mix. Bake at 190°C for 20–30 minutes, until golden.
8. For a fuller flavour, drizzle a little olive oil over the top of the crumble before serving.

REFLECT ON LEARNING

1. Write the classification of the following fruits: lychee, strawberry, lemon and blueberries.
2. Outline the benefits of eating two pieces of fruit every day.
3. Compare the characteristics of a citrus fruit and a pome fruit.
4. List two different methods of cooking fruit. Describe the impact this cooking method has on the properties of fruit.
5. Name a recipe where fruit is used in a savoury meal. Prepare this savoury meal and evaluate the sensory properties.

Tasty Trivia

It is said that an apple a day keeps the doctor away. Can you think of other myths, nursery rhymes or legends associated with apples?

Figure 5.15 Make sure to add different colours, shapes and textures when you prepare a fresh fruit dish.

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5.10 LET'S COLLABORATE

Compare four apples before and after cooking for taste, texture, appearance and the impact of air, or **oxidation**.

Figure 5.16 Different apples have different tastes and textures.

oxidation The combining of a substance with oxygen.

1. Working in a group of four, select one apple of each variety.
2. Cut each apple in six pieces, leave the skin on.
3. Use one piece to test oxidation, four pieces for tasting, and reserve one piece to cook.
4. Oxidation: Leave one piece sitting on a plate for as long as you can (at least as long as it takes to complete the other steps). Observe what happens. When the tables for the other steps have been completed, set up a table like the one below and record your results.

Oxidation	Taste	Texture	Appearance
Apple 1			
Apple 2			
Apple 3			
Apple 4			

5. Uncooked pieces: Taste each apple. In your book set up a table like the one below and record your results.

Uncooked pieces	Taste	Texture	Appearance
Apple 1			
Apple 2			
Apple 3			
Apple 4			

6. Cooked pieces: Place the apple pieces in a small saucepan or microwave dish with 1 teaspoon water, microwave for one minute or simmer gently for two minutes. After cooking, set up a table like the one below and record your results.

Cooked pieces	Taste	Texture	Appearance
Apple 1			
Apple 2			
Apple 3			
Apple 4			

7. Compare and assess the results for each apple.
8. Select the preferred apple. Justify your choice based on the properties of the apple.

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5.9 Structure of vegetables: Physical properties

The classification of vegetables is simpler than it is for fruit. Vegetable classification is based on the part of the plant that is eaten – for example, for leaf vegetables like lettuce and cabbage you eat the leaves of the plant.

Knowing the classification is useful, as often vegetables of the same classification can be prepared in similar ways. This means that you can often substitute a vegetable of a similar classification – for example, in a stir-fry, if the recipe asked for a Chinese green such as bok choy and you could not obtain it, you could substitute it with a similar green, leafy vegetable such as spinach.

5.11 ACTIVITY

Classifying vegetables

Using leaf vegetables as a guide, investigate four examples of vegetables for each of the following classifications:

- tuber
- bulb
- flowers
- fruit
- sprout
- root
- shoots
- stems
- seed
- fungus.

Use Figure 5.17 to help you.

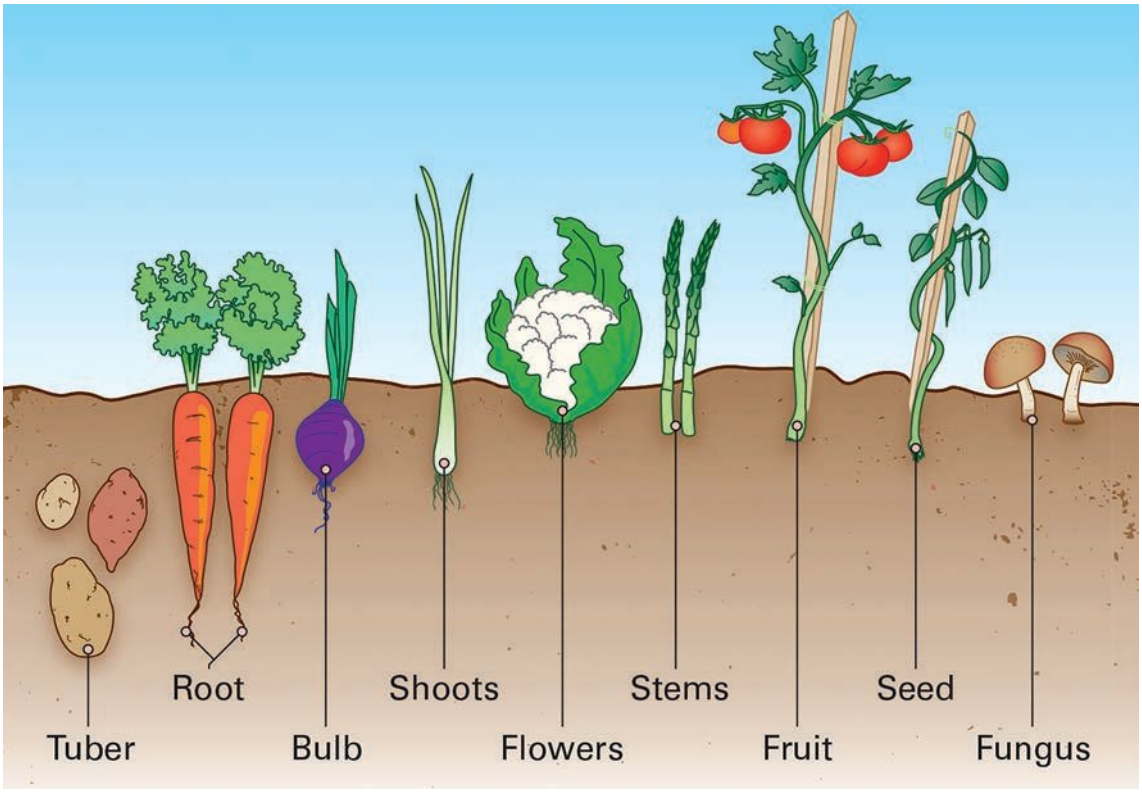

Figure 5.17 Classifications such as tuber, root and bulb vegetables can be difficult, as they all grow in the ground, but are different parts of the plant.

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Rice paper rolls

VIETNAM

RECIPE

Main tools and equipment

Knife, bowl, grater, chopping board, measuring spoon

Production skills

Grating, slicing, chopping, rolling

MAKES 6

Preparation time: 30–40 minutes

Serving and presentation time: 10 minutes

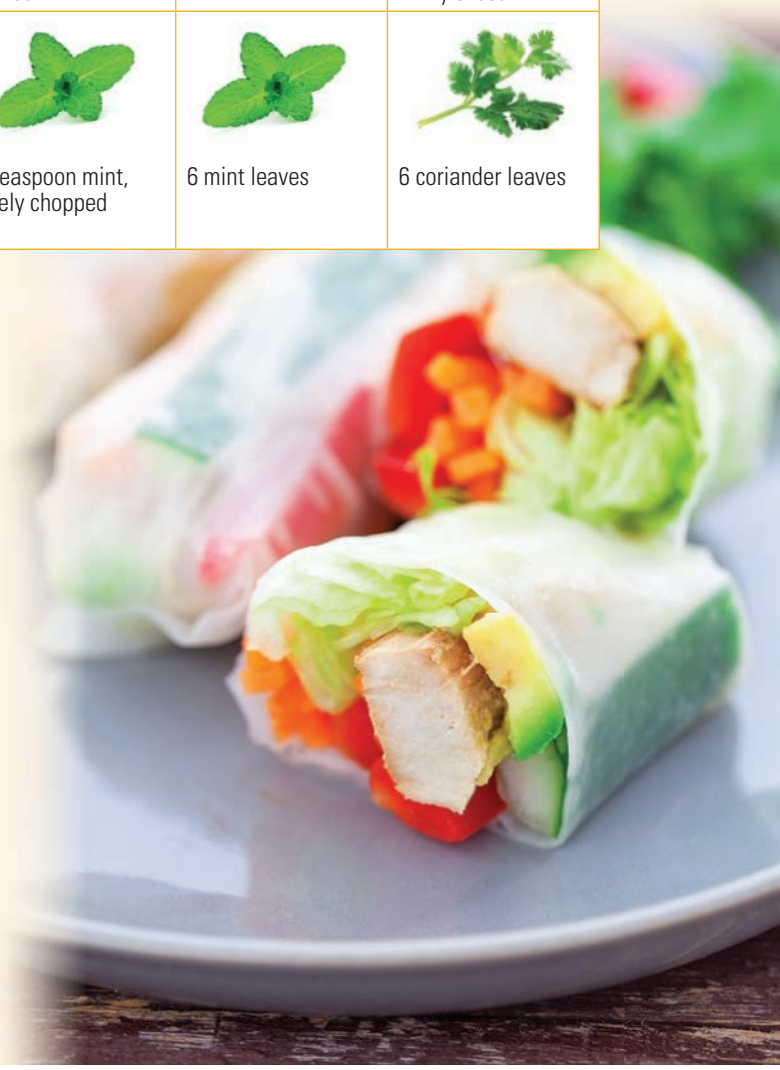
Total time: 40–50 minutes

Ingredients

 30 g rice vermicelli	 1 cup cooked chicken, sliced	 ¼ continental cucumber, julienned	 ¼ large carrot, grated	 20 g bean sprouts	 ¼ red capsicum, thinly sliced
 2 teaspoons sweet chilli sauce	 6 rice paper sheets	 1 teaspoon coriander, finely chopped	 1 teaspoon mint, finely chopped	6 mint leaves	6 coriander leaves

Method

1. Soak vermicelli for 10 minutes in warm water and drain. Cut into 5 cm lengths.
2. Combine chicken, vermicelli, all vegetables, sweet chilli sauce and chopped herbs. Mix well. Divide into 6 portions.
3. Dip 1 sheet of rice paper in hot water for about 30 seconds or until it becomes soft. Spread on your bench.
4. Place vermicelli and vegetables in a bundle with the top edge of vegetables level with the edge of the rice paper.
5. Fold in edges so that sides are not open. When halfway through rolling, add a sprig of coriander and a mint leaf as the garnish. They should be encased in rice paper, but visible.
6. Repeat steps until you have 6 rice paper rolls.
7. Serve with Nuoc Cham dipping sauce, if desired.



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5.12 ACTIVITY

Vegetable passports

Randomly select a particular vegetable and design a 'passport' for the vegetable. This activity could also be completed for fruit. An example of a completed 'passport' follows:

Vegetable: Capsicum.

Name on birth certificate: Capsicum annum.

Family name: Fruit vegetable.

AKA (also known as): Pepper, sweet pepper.

Birthplace: South America.

Family relations: Paprika, pimiento and different chilli varieties.

Best friends: Onions, garlic, tomatoes, eggplant, olive oil, lamb, chicken.

Report card: Very high in vitamin C, especially red capsicum. Red capsicums are also rich in carotene, which is converted to vitamins in the body. All capsicums are a source of dietary fibre, folic acid and potassium.

Best address: Crisper in the refrigerator.

Best appearance: Firm, crisp flesh, no blemishes on the skin, bright colours.

Hates: The confusion caused when some people call it a capsicum and some people call it a pepper.

Loves: Being grilled until the skin is black and can easily be removed to leave soft, sweet flesh; being stuffed with rice and flavourings to create a terrific satisfying meal.

Best skills: Disguising itself: changes colour as it ripens and becomes sweeter; also comes in a range of colours – orange, purple, red and green.

Favourite holiday spots: Salads, stir-fries, casseroles, fried rice.

Undercover part-time occupation: Capsicum spray for police; chemical components used in modern medicine to treat toothache, arthritis and respiratory disorders.

DESIGN THINKING: DESIGN YOUR DIP!

The carrot, ham and lavash roll (recipe on p.128) is a tasty lunch treat. Included in the recipe is one tablespoon of dip, which provides colour, flavour and texture for this product. You need to design your own dip for inclusion in your lavash roll.

Investigating

1. Research different ingredients used in dips.
2. Investigate different dip recipes (check out some ideas in this book and *Recipes for Food Technology: Middle Secondary*)
3. Sample different dips if available to discover what flavours you enjoy.

Generating

1. Brainstorm a list of different dip options suitable for your lavash roll.
2. Decide on your final option and justify your choice.

Planning and managing

1. Identify the tools and equipment you will need to prepare your dip.
2. Prepare a work plan to ensure you are able to produce your dip and lavash roll in a timely manner.

Producing

Prepare your dip and then use in the lavash roll recipe.

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Carrot and ham lavash rolls

ARMENIA

RECIPE

Main tools and equipment

Bowl, knife, grater, metal spoon, measuring spoons, spatula, chopping board

Production skills

chopping, grating, rolling up

MAKES 2 ROLLS

Preparation time: 20 minutes

Serving and presentation time: 5 minutes

Total time: 25 minutes

Ingredients

 1 tablespoon designed dip	 ½ tomato, seeded and chopped finely	 ½ tablespoon chives, finely chopped	 ½ carrot, peeled and grated
 1 tablespoon corn kernels	 2 pieces lavash bread	 2 slices leg ham, sliced	

Method

1. In a small bowl, mix tomato, chives, carrot and corn.
2. Spread lavash bread with dip. Top with ham.
3. Spread each piece of lavash bread evenly with tomato and carrot mix.
4. Roll up tight to enclose the filling and serve.

Evaluating

1. Reflect on the decisions that you made during the making of the lavash roll. List each decision you had to make. Explain the impact that each decision had on the outcome of the end product.
2. Generate a list of other ingredients that could be used in this lavash roll.
3. The lavash roll is an ideal lunchbox snack. Explain how you could ensure that the ingredients in the roll remain of optimal quality when you eat it at lunchtime.

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5.10 Primary production of vegetables

Primary processing: potatoes

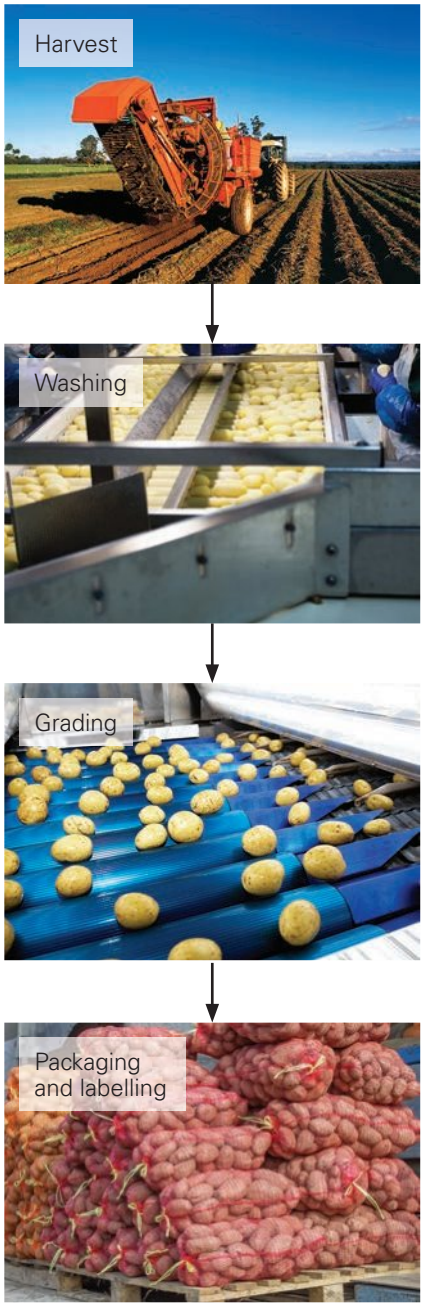

Figure 5.18 The primary steps involved in producing potatoes.

Tasty Trivia

The green colour seen on old potatoes is caused by the toxin solanine, which can be poisonous if eaten.

5.11 Best-quality vegetables: Sensory properties

When buying vegetables, ensure that produce has the characteristics shown in Figure 5.19.

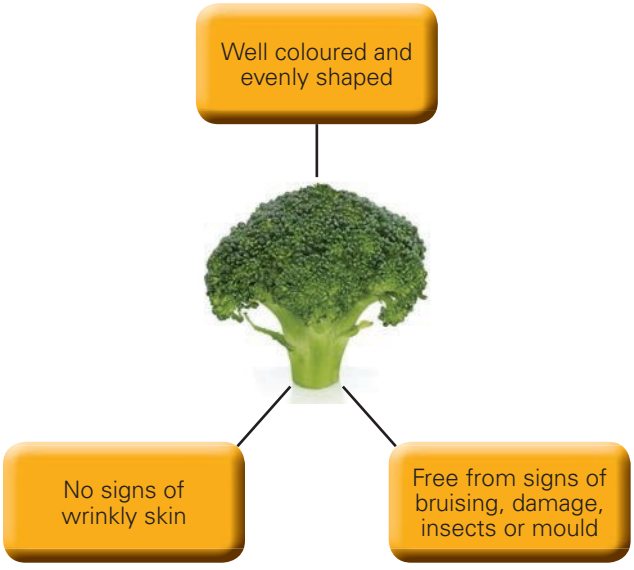

Figure 5.19 The characteristics of high-quality vegetables.

Vegetables should be stored carefully to maintain their properties. Most vegetables are best kept in the fridge below 5°C to ensure the longest possible shelf life; the exceptions are potatoes and onions, which should be stored in a cool, dark, dry place. Remember to wash your vegetables, especially your leafy greens, but never wash mushrooms – just give them a wipe down to remove any dirt as they will absorb water and go slimy when stored.

5.12 Cooking with vegetables

The versatility of vegetables means they can be prepared and cooked in many different ways and in many cases they can be eaten raw.

Do you eat five vegetables a day?

The recommendation is to eat five serves of vegetables every day. Soup in winter and salads in summer are a tasty, quick and effective way to consume five vegetables in one dish. Five vegetables in one soup could give you a

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warming and filling lunch and help to solve the challenge for one day. Create your own soup or make the Vroom Veg Soup below.

You may use fresh herbs like parsley, thyme and bay leaf, or chicken, beef or vegetable stock cubes.

Produce your soup following the method in the recipe.

5.13 LET'S COLLABORATE

1 Identify the cutting techniques in Figure 5.20 from left to right. Provide a definition for each of the techniques illustrated.

2 In groups, discuss how you might use each of these carrot cuts.

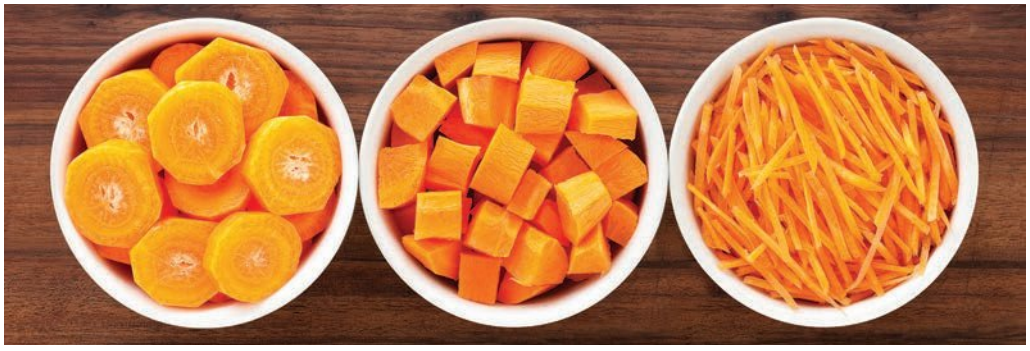

Figure 5.20 Different cutting techniques allow us to use the carrot in different ways in different dishes.

DESIGN BRIEF: VROOM VEG SOUP

Vroom Veg Soup is an example of an ideal meal-in-one soup. Design a five-vegetable soup. Give it a name representing the goodness in the soup, like Vroom Veg Soup.

The recipe gives you some suggestions about flavourings and quantities. If you could design a five-vegetable soup, what would you put in it? You can also add a meat ingredient if you wish.

Investigating

1 Make a list of the vegetables that could be used in a soup.

2 Make four different possible combinations of vegetables that would be ideal for a soup. Think of colour, texture variations and taste variations.

3 Discuss what will happen during cooking; compare the impact on properties of cooking a potato, tomato, carrot and celery.

4 Soup usually has different flavourings. How can the soup be flavoured?

Generating

1 Select your preferred combination. What will be the best way to prepare the vegetables in the soup: dice, slice or purée?

Planning and managing

1 Using graphical representation, design how you will present your soup, including a garnish.

2 Determine the tools and equipment you will need to use, making sure you know how to use each item safely.

3 Prepare a production plan to ensure you are organised and ready for production.

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Cambridge University Press

Vroom veg soup

Main tools and equipment

Chopping board, knife, measuring spoon, measuring jug, measuring cups, grater, scale, wooden spoon, large saucepan

Production skills

Dicing, grating

Cooking processes

Sautéing, simmering

SERVES 2

Preparation time: 30 minutes

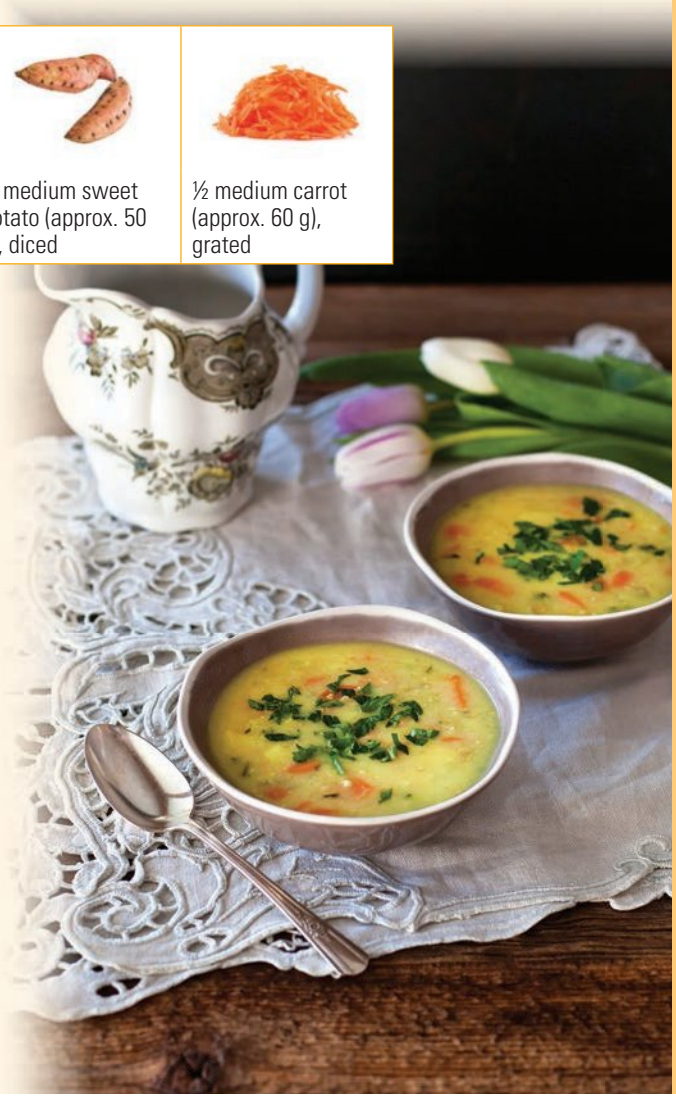
Cooking time: 25–30 minutes

Serving and presentation time: 5 minutes

Total time: 60–65 minutes

Ingredients

 1 small onion (approx. 60 g), finely diced	 1 teaspoon olive oil	 ½ medium potato (approx. 50 g), diced	½ medium sweet potato (approx. 50 g), diced	½ medium carrot (approx. 60 g), grated
 ½ stick celery (approx. 30 g), diced	 500 ml water	 1 vegetable stock cube		
 ½ cup corn kernels (fresh, canned or frozen)	 ¼ cup orange lentils	 1 bay leaf		
 pepper for flavouring	 1 teaspoon fresh parsley, finely chopped (garnish)	 1 teaspoon thickened cream (garnish)		



ISBN 978-1-316-64912-1

Vroom veg soup – continued

Method

1. Sauté the onion in the olive oil until it is soft and transparent. Be careful not to let it burn.
2. Add the potatoes, carrot and celery, and sauté for 3 minutes.
3. Add the water, stock cube, corn and lentils. Add the bay leaf. Bring to the boil.
4. Cover with a lid, turn the heat down and simmer for 15 minutes.
5. Check the flavouring and add pepper if needed.
6. Garnish with chopped parsley and cream. Can be served with bread.

Evaluating

1. Explain how the preparation process has created different textures.
2. Suggest two ways in which you would change the vegetables to give different flavours. Remember to describe how you would prepare the vegetables.
3. The lentils, potato and corn help to thicken the soup. Identify two other ingredients that could be used to thicken the soup.
4. This soup is not a rainbow. Suggest which vegetables could be added to make a rainbow.
5. Reflect on your work practices. Describe where you went well, providing evidence to support your discussion. Describe an area where you would like to focus on improving when next designing.

DESIGN BRIEF: A BURGER FOR VEGETARIANS

Your family is having a barbecue. One of the guests is a vegetarian and you do not want them to feel left out. Design and create a vegetarian burger. Vegetarian burgers can often be dry or not have much flavour, so the goal is to make a tasty vegetarian burger. What will make it work? It needs:

1. an ingredient to hold it together
2. to contain similar nutrients to meat (what are they?)
3. to have an interesting colour and texture to make it appealing
4. to be tasty.

Investigating

Start with a basic recipe such as the Sweet Potato and Chickpea Burger recipe on p.133 and offer variations on this.

Generating

- Generate a list of possible ingredient ideas to use in your burger.
- Decide on your final option.

Planning and managing

- Develop your production plan.
- Design how you will present your burger, and include annotations.

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Sweet potato and chickpea burger

Main tools and equipment

Bowl, measuring spoons, peeler, zester, wooden spoon, frying pan, saucepan

Production skills

Peeling, chopping, mashing, shaping, zesting

Cooking processes

Frying, grilling

SERVES 1

Preparation time: 40 minutes

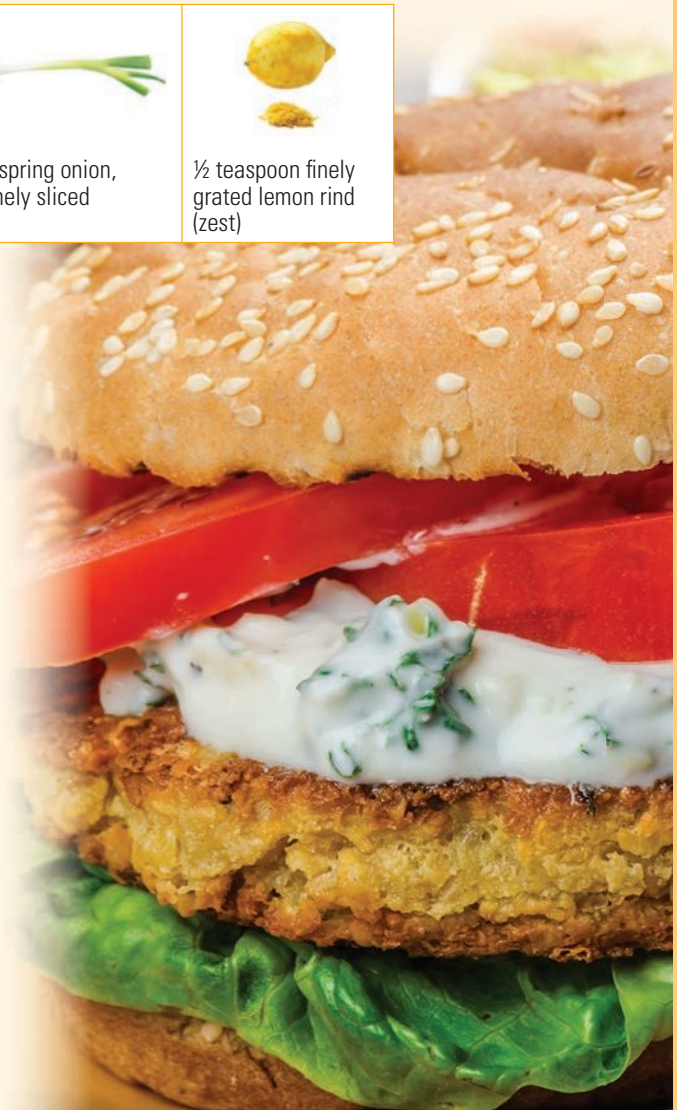
Cooking time: 12–15 minutes

Serving and presentation time: 5 minutes

Total time: 57–60 minutes

Ingredients

 250 g sweet potato, peeled, cut into 2 cm pieces	 1 can (125 g) chickpeas, drained and mashed	 1 tablespoon wholegrain breadcrumbs	1 spring onion, finely sliced	½ teaspoon finely grated lemon rind (zest)
 ¼ teaspoon ground cumin	 Salt and pepper	 1 egg		
 2 teaspoons oil	 1 wholemeal or seeded roll, split	 2 teaspoons chilli sauce or 2 teaspoons tomato relish		
 ½ tomato, sliced	 2 teaspoons cucumber and yoghurt sauce (optional)	 Shredded lettuce or baby rocket leaves		



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Sweet potato and chickpea burger – continued

RECIPE

Method

1. Cook the sweet potato in a medium saucepan of water for 4 minutes or until tender, or microwave for 3 minutes. Drain.
2. Place in a bowl and mash coarsely. Add the chickpeas, breadcrumbs, spring onion, lemon rind (zest), cumin, pepper, salt and egg. Stir thoroughly to combine.
3. Shape into a patty. Place on a plate, cover with plastic wrap and refrigerate to chill.
4. Heat the oil in a small non-stick frying pan over a medium heat. Cook the patty for 4 minutes on each side. The patty should be heated through.
5. While the patty is cooking, grill the cut side of the roll until toasted.
6. Spread the chilli sauce or tomato relish onto the roll and add tomato slices. Place the burger on top, add the yoghurt sauce if desired and top with lettuce.
7. Serve.

Evaluating

Look at the requirements in the design brief. Did you create a solution by fulfilling all the requirements? Respond to each of these requirements.

1. 'Vegetarian burgers can often be dry or not have much flavour.' How well does your burger fit this criterion from the brief? Evaluate the burger for taste and texture. Use the hedonic scale for your taste test. Justify the position on the scale using descriptive words.
2. Explain how well the burger held together. Suggest a change if it did not hold together.
3. Explain how the burger met the requirements of 'interesting colour and texture to make it appealing' and 'tasty'.
4. Discuss alterations you could make to the ingredients if you made it again.

Tasty Trivia

Fruits and vegetables feature in many nursery rhymes and jokes. How many can you think of? Here are two to start.
What vegetables do sailors hate? Leeks!
What is the fastest vegetable? A runner bean!

Check out potatoes

To raise awareness of the role the potato can play in defeating hunger and poverty in the world, the Food and Agriculture Organization (FAO) of the United Nations declared 2008 the International Year of the Potato. The Year of the Potato was also intended to highlight its considerable flexibility in food cooking and ease of growing in many different climates.

In the world fight against hunger and malnutrition, the potato can contribute a significant proportion of the recommended daily allowance of some minerals and vitamins – enough to be a lifesaver for many people.

An average potato with skin:

- contains 600 mg potassium – comparable to a banana
- has more iron and vitamin C than half a cup of spinach
- is an important source of vitamin B and natural fibres
- is high in carbohydrates.

The average intake of potatoes consumed by Australians is more than 60 kg per person each year, which is a lot of mash, chips and baked potatoes. In Australia, potatoes are by far the largest vegetable crop in terms of area and production, with 1.2 million tonnes grown annually.

Figure 5.21 Do you know your potatoes?

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Tasty Trivia

In the French language, 'potato' and 'apple' are the same word. The potato is *pomme de terre*, translated as 'apple of the earth', and the apple is called *pomme*.

5.14 ACTIVITY

Favourite veggies

1. Interview students or adults and ask them about their two most favourite vegetables. Try to interview 20 people – 10 males and 10 females. Greater comparisons in data could be achieved by different students interviewing children under five, primary school age, Years 7–9, Years 9–12, young adults and older adults. Compare the results for different ages and sexes. Can you see any similarities?
2. Using a computer, create a bar graph similar to the one displayed in Figure 5.22 to show your results. Compare the results on your graph with those in Figure 5.22.
3. Compare the types of vegetables consumed in your class with those produced in Australia as a whole. Suggest possible reasons for differences.
4. Explain how these results compare with your personal tastes in vegetables.

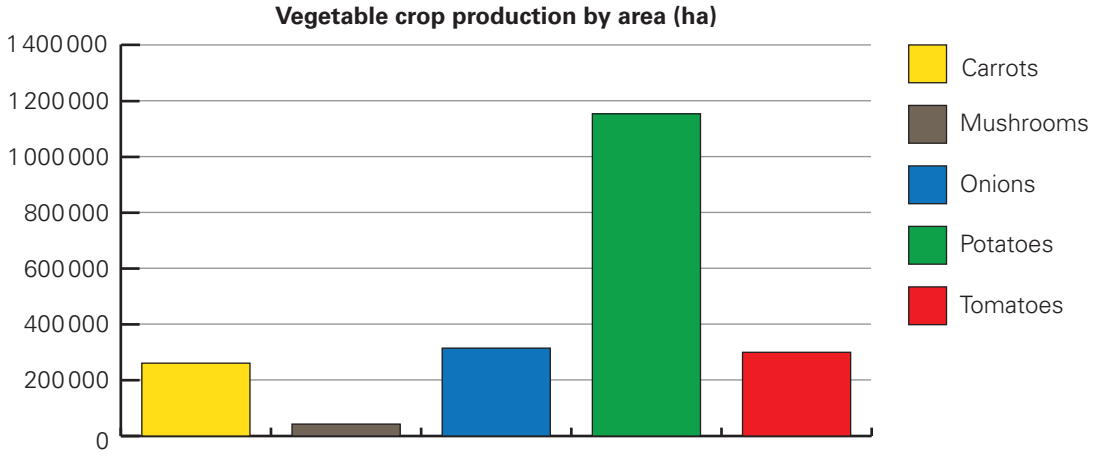
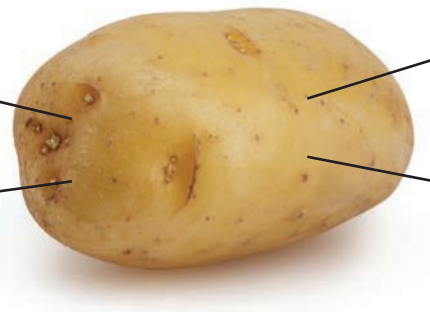


Figure 5.22 Vegetable crop production (tonnes) in 2014–15

A total of 11 acres of potato crop were recorded near Sydney in 1797, soon after the arrival of the early British settlers.

The potato is the world's fourth most popular food crop.



Some 5500 varieties have been cultivated over thousands of years.

Following their conquest of the Inca civilisation in 1532, the Spanish conquistadors took not only precious metals, but also the potato back to Spain. It has become an important part of traditional Spanish dishes.

Figure 5.23 Potato trivia

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Rosemary potato wedges

USA

RECIPE

Main tools and equipment

Chopping board, measuring spoons, zester, knife, oven tray, saucepan or microwave bowl, fork

Production skills

Cutting, coating, zesting

Cooking processes

Parboiling, baking

SERVES 2

Preparation time: 40 minutes

Cooking time: 35 minutes

Serving and presentation time: 5 minutes

Total time: 80 minutes

Ingredients

 4 medium brushed potatoes	 1 tablespoon olive oil	 1 tablespoon chopped fresh rosemary	 ¼ teaspoon dried oregano
 pinch black pepper	 pinch cayenne pepper	 ¼ teaspoon sea salt	 2 lemons, finely grated lemon rind (zest)

Method

1. Preheat the oven to 220°C.
2. Prepare a baking tray by lightly greasing or lining with baking paper.
3. Wash the potatoes. Do not peel.
4. Prick the potatoes with a fork or metal skewer. Parboil the potatoes for 10 minutes or microwave for 5–8 minutes, or until they are partly soft.
5. Cut each potato lengthwise into 6–8 wedges, depending on their size.
6. In a bowl, combine the olive oil, rosemary, oregano, black pepper and cayenne pepper.
7. Place the potatoes in the bowl with the oil mixture and gently stir to evenly coat the potatoes.
8. Place wedges skin-side down in a baking dish.
9. Sprinkle with salt.
10. Bake in a very hot oven (220°C) until they are crisp and brown. They can also be placed under the griller to make them crisp.
11. Place the wedges on a serving dish and sprinkle with lemon rind.

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Evaluating

Rosemary, oregano, black pepper, cayenne pepper, salt and lemon rind are all used to add flavouring to the wedges.

1 Suggest different flavourings that could be used. Compare your choices with those of your partner.

2 Explain why these wedges are healthier than wedges bought from a supermarket.

DESIGN BRIEF: PASS THE SAUCE, PLEASE!

Design a dipping sauce that can be served as an accompaniment to the Rosemary Potato Wedges.

REFLECT ON LEARNING

1 Describe how vegetables are classified.
2 Give one example each of a stem, flower and root vegetable.
3 Outline the best way to store onions for optimal shelf life.
4 Name the classification to which spinach, cabbage and lettuce belong.
5 Explain why it is necessary to consume the recommended amount of vegetables every day.

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LOOKING BACK

1. There is evidence of cultivation of fruit dating back over 8000 years.
2. Fruits and vegetables are the edible parts of plants: fruits contain the seeds of plants, and vegetables can be many different parts of the plant.
3. Fruits and vegetables are often classified or grouped according to similar characteristics. Fruits and vegetables of similar classifications can often be prepared in a similar way. A large variety of fruits and vegetables is available to Australians.
4. Eating a rainbow of colours is the best way to get a good mix of nutrients from fruits and vegetables.
5. There is considerable flexibility in the ways fruits and vegetables can be served and eaten.
6. Different preparation and cooking techniques can reduce the nutrient content of fruits and vegetables.

TEST YOUR KNOWLEDGE

Multiple choice

1. The number of serves of vegetables people should eat per day for good health is:
   - **a** two
   - **b** three
   - **c** four
   - **d** five.
2. Which of the following are examples of fruit classifications?
   - **a** stone, tubers, vines, pomes
   - **b** citrus, seed, stone, berries
   - **c** pomes, vines, bulb, shoots
   - **d** citrus, stone, pomes, vines.

True/false

1. Fruits and vegetables are best served with the skin removed.
2. Apples, pears and oranges all grow on trees; therefore, they have the same classification.
3. Frozen vegetables are good substitutes for fresh vegetables.

Short answer

1. Explain how fruits and vegetables are classified.
2. Outline the nutritional benefits of consuming fruits and vegetables.
3. Briefly describe each colour from the 'rainbow' of fruits and vegetables.

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Extended response

Your team has been employed by a selected fruit or vegetable company to create a brochure to advertise the versatility of the identified ingredient. The brochure will be titled '10 ways with …' The brochure is to target beginner cooks or people who are becoming more independent. Work in small groups to investigate using one fruit or vegetable in 10 different ways. Present the information in a brochure to promote the use of the selected fruit or vegetable.

Within the brochure, include the following:

- varieties of the particular fruit or vegetable available
- when the particular fruit or vegetable is in season
- its use in a breakfast, light lunch or snack item
- its use as a part of a main dish – sweet or savoury
- its use in a traditional dish.

The 10 different ways need to be economical, and reasonably quick and easy to prepare. Each recipe should include a short two-line discussion about the recipe and why it would be a good choice for a beginner cook.

1. As a group, discuss and write down four statements that you all should follow to make sure the group will work well together to achieve the best outcomes. At the end of the activity, you will comment on your effectiveness in working to the four statements.
2. Work as a group to divide up the different sections of the task.
3. Start the investigation by coming up with spontaneous ideas within the group. Try to do this without extensive research into recipe books.
4. Collect the required information and present it as a leaflet. This may include photographs.
5. On completion, evaluate the effectiveness of the group according to the statements.
6. Discuss and write down any other statements that you now think should have been included.

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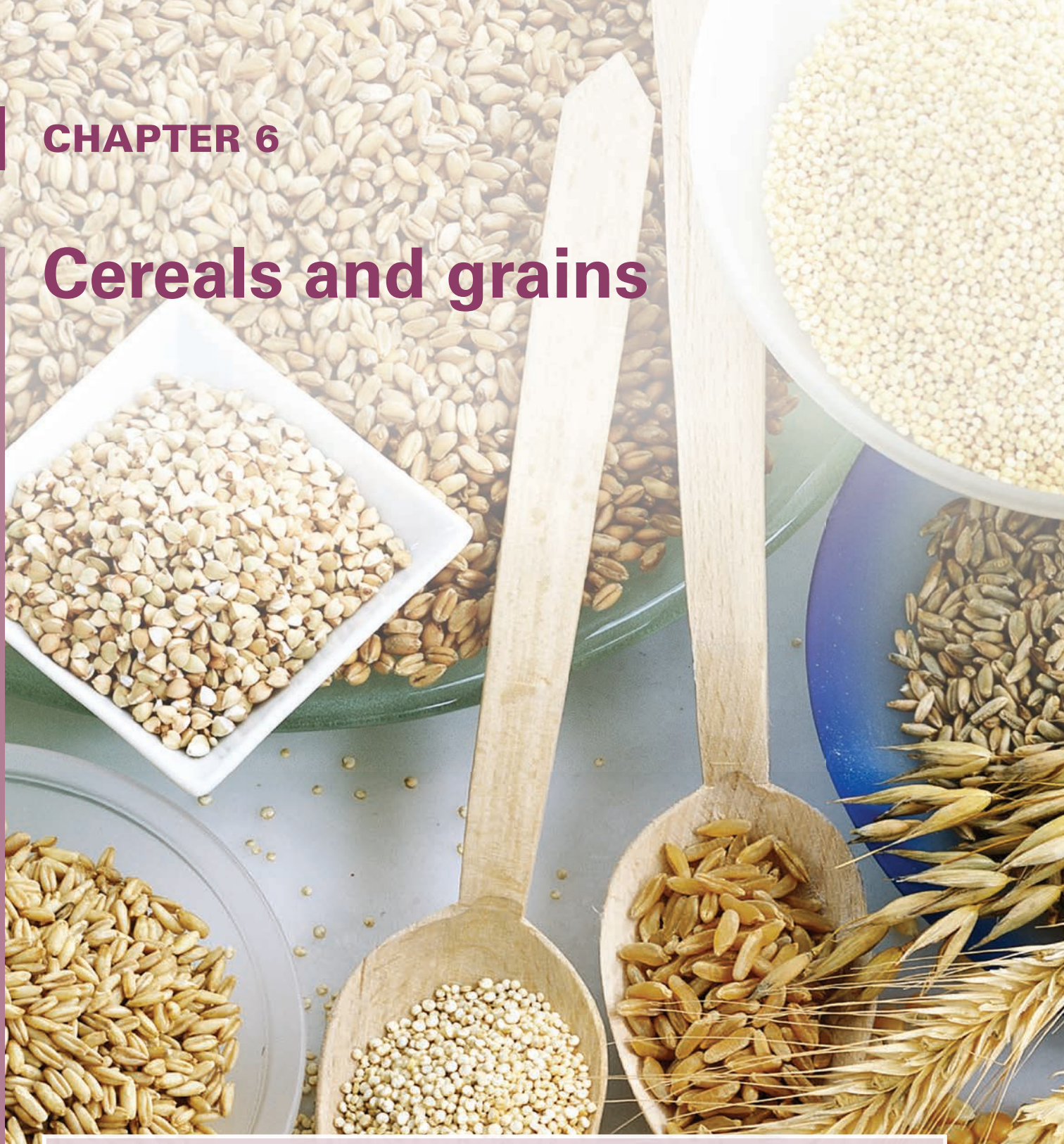
CHAPTER 6

Cereals and grains



ACCESS PRIOR KNOWLEDGE

1. List the different types of cereal grains eaten throughout the world.
2. Identify the staple grains of China, Indonesia and Japan.
3. Explain where and when the first cereal grain was cultivated.
4. Compare the bran, the endosperm and the germ.
5. Suggest how rice and wheat can be used in the preparation of different food items.
6. Discuss the reasons why cereal grains are so important in our Australian diet.

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6.1 Cereals: The basics

Cereals or cereal grains are grasses cultivated (grown) for their edible parts or seeds. Grain foods, which include cereals, are the dietary staples for many cultures. For us in Australia, wheat is the most important cereal.

cereals Grains used for food, such as wheat and maize.

6.1 LET'S COLLABORATE

With a partner, name the countries that are well known for their use of wheat, rice and corn (maize). Can you think of any recipes that use each of these? Name the country or culture from which these recipes/dishes originate.

History of cereals

The word 'cereal' is derived from Ceres, the name of the pre-Roman goddess of harvest and agriculture. People have enjoyed grain foods for at least the past 10 500 years. It is believed that people started to **cultivate** weeds and grasses in fertile regions in the Middle East. In China, 1000 years later, rice and millet were cultivated from wild grasses and corn was the main grain being cultivated in America.

cultivate To prepare the land and soil for the growing of crops and cereal grains.

Tasty Trivia

Many myths and legends are associated with grains. The goddess Demeter gave wheat to the Greeks; in Egypt, the god Ra gave his people grains; and the Aztecs gave thanks to their corn goddess with amaranth grain products.

Figure 6.1 A variety of cereal grains

Tasty Trivia

Sago comes from the sago palm, which grows in South-East Asia. When it is processed, it looks like little balls or pearls. To collect the sago, the bark from the trees is peeled back from the trunk and the inner section is cut into pieces. The pith is scooped out and ground into powder, which is then washed and dried into flour. The pearls are made by washing the wet starchy paste through a sieve, which is on a hotplate drying the paste quickly into small balls.

Sago gula melaka is a sago pudding made in Malaysia by first boiling sago in water and then adding palm sugar syrup and coconut milk.

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Sago pudding

RECIPE

Main tools and equipment

Saucepan, strainer, zester, measuring spoons, measuring jug

Production skills

Combining

Cooking processes

Boiling

SERVES 2

Preparation time: 10 minutes

Cooking time: 40 minutes

Serving and presentation time: 5 minutes

Total time: 55–60 minutes

Ingredients

 1 litre water	 200 g sago	 30 ml coconut cream	 1 teaspoon vanilla
 1 tablespoon honey	 150 ml cream	 Zest of half a lemon	

Method

1. In a saucepan, bring the water to the boil and cook the sago until it is transparent.
2. Strain and rinse with cold water to remove some of the starch.
3. In a saucepan, combine the coconut cream, vanilla, honey, cream and lemon zest.
4. Bring to the boil.
5. Cook until liquid has reduced by a third. Remove from heat and add to cooked sago.
6. Transfer to serving glasses and either serve warm or place in the fridge to chill and serve cold.

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6.2 LET'S COLLABORATE

Sustainable practice

Examine Figure 6.2. With the class, discuss the way in which rice is harvested and estimate the hours required to harvest just 1 square metre of land.

Discuss with a partner why rice is such a difficult crop to grow. Much of the rice we eat is grown overseas. How does this impact on the number of global miles that a rice grain has to travel before we eat it?

During a meal that includes rice, how much becomes waste or rubbish? Consider the impact of this in terms of harvest time and food waste.

Figure 6.2 Rice fields in China

6.3 INVESTIGATE IT

Countries of origin

Conduct an internet search to find out where one of the cereal grains listed below originated. (Be sure that the class covers all the grains listed.) Prepare a visual display (poster or PowerPoint presentation) to explain your findings. Be sure to include a map that shows where the grain was first cultivated:

- wheat
- rice
- corn
- oats
- rye
- barley
- spelt
- millet
- quinoa
- amaranth
- kamut.

REFLECT ON LEARNING

1. Explain how a cereal grain is cultivated.
2. Identify the staple grain in the Australian diet.
3. Make a list of the different types of cereal grains. Place a tick next to those that you have eaten.
4. Cereal grains have been cultivated for many years. Evaluate the reason why they are so important to so many cultures.
5. Copy out the list below into your workbook or on to your computer and underline the six cereal or cereal products:
   - bread
   - salami
   - tomato juice
   - spaghetti
   - olives
   - cornflakes
   - brown rice
   - cheese
   - porridge
   - yoghurt
   - cornflour
   - beans.

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6.2 Structure of cereals: Physical properties

Grains consist of three main parts:

1 The **bran** – the protective outer layer of the grain. This outer husk is often removed during processing. The bran is high in dietary fibre and B group vitamins.

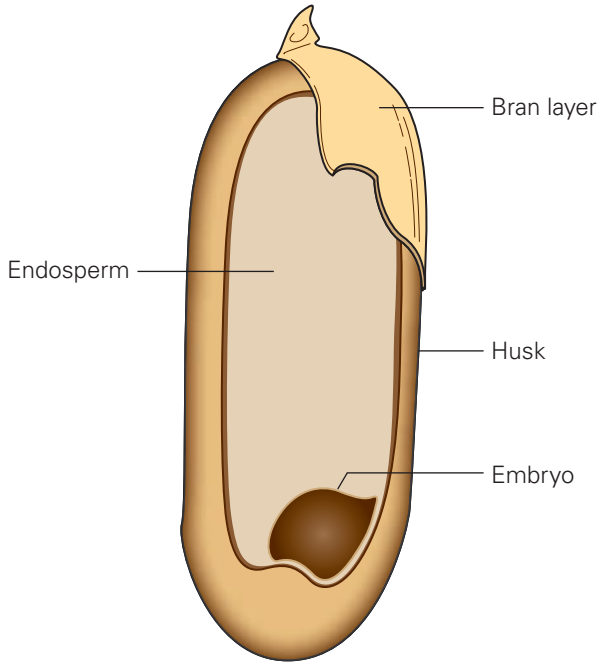
2 The **endosperm** – the main part of the grain. The endosperm contains starch: carbohydrates, protein and some vitamins and minerals.

3 The germ – the smallest part of the grain and the seed for a new plant. This part of the grain contains B group vitamins, some proteins, minerals and **essential fatty acids**.

bran The protective outer layer of the grain.

endosperm The main part of the grain.

essential fatty acids (EFA) 'Good' fats; the body does not produce these, so they must be consumed from food. Examples of foods that supply EFA are nuts, avocado and fish.



- Starchy endosperm – the centre part of the rice grain where starch is stored.
- Bran layer – outer bran layer, which is high in dietary fibre; this is removed from brown rice to produce white rice.
- Husk – the dry outer covering.
- Embryo – sometimes called the germ.

Figure 6.3 Cross-section of a cereal grain

Primary production: Wheat into flour

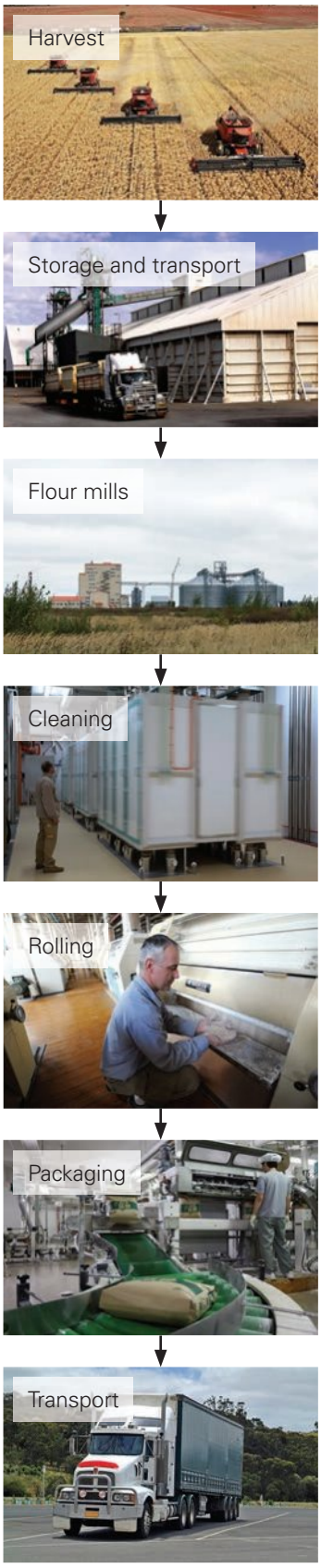


Figure 6.4 The stages of processing wheat into flour

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6.3 Health claims: A focus on folate

In Australia, **nutrition content claims** are allowed to be printed on food labels and used in product advertising, but the law prohibits the use of **health claims**. An example of a nutrient claim is 'dietary fibre helps keep you regular'. Nutrient claims also refer to the absence or low levels of a nutrient – for example, when a product is labelled 'low in cholesterol'.

nutrition content claims Statements made by a manufacturer about the amount of a nutrient, energy or a biologically active substance in the food.

health claims General health claims describe a relationship between the consumption of a food, or a component in the food, and a health benefit. High-level health claims describe the function of a food, nutrient or other substance in relation to a serious disease – for example, heart disease. High-level health claims must have approval from Food Standards Australia and New Zealand.

A product needs to meet specific criteria in order to make this claim. For example, a food that is described as 'low in cholesterol' must contain no more cholesterol than 20 milligrams per 100 grams of solid food. There is also a list of criteria that examine the energy, saturated fat, sodium, sugar, fibre and amount of fruit that is in the food. If a product does not meet these criteria, the claim cannot be made.

Despite legislation regulating nutrient claims on food products, products are often labelled simply to appeal to consumers and encourage people to buy them because of their perceived health benefits.

Health claims make a direct connection between consuming a food product or nutrient found in the food and the decreased risk of a specific disease. An example of a health claim would be that eating the product will prevent the development of bowel cancer. To have the right to display a health claim, it must be proven that the foods are completely safe, effective and able to perform what has been promised.

The only health claim permitted in Australia is regarding folate. This is allowed because there is conclusive evidence demonstrating the benefit of folate before and during pregnancy in the prevention of neural tube defects such as spina bifida in babies. In 2007, **mandatory** minimum and maximum levels of folate were introduced for bread to reduce the risk of neural tube defects.

mandatory Something that is compulsory.

6.4 LET'S COLLABORATE

1. You have probably eaten the bran layer of the cereal grain. Bran is often eaten for breakfast. Can you think of any breakfast cereals that contain bran? Perhaps you have seen some advertised on television. Discuss with a classmate.
2. Visit the supermarket and find five breakfast cereals that contain bran.
3. Bran contains important B group vitamins. List some of the B group vitamins.
4. Do you know the function or food sources of any of these vitamins? Compare your knowledge with that of a partner.
5. Find out about the nutritional content of the endosperm and the germ.
6. Develop a list of food products that contain the endosperm and the germ.

There are so many types of cereals!

A number of different cereal grains are eaten throughout the world. They include wheat, rice, barley, oats, rye and corn. They can be eaten as wholegrain cereals and are often processed or made into refined cereals. Both wholegrain and refined cereals play a significant part in the diet of most Australians.

Tasty Trivia

Research carried out in 2000 showed that eating one serve of wholegrain cereal every day can reduce the risk of developing type 2 diabetes.

6.5 INVESTIGATE IT

Log on to the Better Health Channel and identify the other health benefits associated with wholegrain cereals.

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6.6 ACTIVITY

Cereal grain or cereal product?

Rearrange the following words and then write them out in your workbook or on your computer to discover the many different types of cereal grains and cereal products:

- osta
- wteha
- yer
- nroc
- icer
- draeb
- olelrdaots
- rncoroulf
- astpa
- yelbar
- bnar
- imzea
- sekalfnrco
- alemurofleohwl.

6.7 INVESTIGATE IT

1. Using the list of cereal grains that you have unjumbled above, find out which cereal grain gives us which food. Use your own knowledge, food labels and books in your school library or the internet to find out which foods come from which cereal grain.
2. For more information on how to include wholegrains in your daily diet, visit the Cancer Council Australia website.

Cereals and wholegrain foods

According to the Better Health Channel:

> High-fibre foods such as wholegrain cereal products increase movement of food through the digestive tract. The result is increased stool (faeces or poo) bulk, softer and larger stools and more frequent bowel actions. This provides a good environment for beneficial bacteria, while decreasing levels of destructive bacteria and the build-up of carcinogenic compounds. Wheat fibre can bind certain toxins and remove them from the large bowel.
>
> A high-fibre diet, especially one high in insoluble fibre, has been associated with decreased risk of developing colon cancer and diverticular disease (a condition where 'pouches' form in the wall of the intestine).

6.8 LET'S COLLABORATE

1. List the wholegrains that you have eaten in the last month.
2. Discuss with the class the importance of wholegrain cereals in our diet.

Figure 6.5 Have you ever looked at the product label on your favourite breakfast cereal? Which grain is it made from?

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Cambridge University Press

6.9 ACTIVITY

Classify the grains

Copy and complete the table below by looking at the list of cereal products and classify them according to the grain from which they originate: rice noodles, wholemeal bread, sweet biscuits, sponge cake, popcorn, corn chips, rice crackers, custard powder, Corn Flakes, Rice Bubbles, Weet-Bix, puffed wheat, cornflour, ground rice, pasta, burghul, corn oil, wholemeal flour, sweet corn, couscous, tortilla wraps, corn bread, taco shells, wheat.

Rice	Wheat	Corn (maize)

6.10 ACTIVITY

Popcorn cooking processes

Popcorn is a wholegrain that can be cooked quite easily, either on the stove top or in the microwave. Work as a class group and follow the instructions on the pack to prepare one quantity of popcorn on the stove top and one quantity of popcorn in the microwave, then answer the following questions.

1. Make a list of the 'other' ingredients required to prepare both types of popcorn.
2. List the safety precautions that should be followed when preparing popcorn on the stove top and in the microwave.
3. Identify the more time-efficient method of preparing popcorn.
4. Explain how the microwave popcorn has been changed or processed compared with the original corn grain for the stove-top popcorn.
5. Develop a list of other ingredients that could be added to the popcorn to change the flavour.
6. Taste-test each type of popcorn and complete a sensory analysis:
   - **a** Indicate the popcorn with the taste that you preferred.
   - **b** Compare the texture of the two popcorns.
   - **c** Explain how the popcorn cooked on the stove top could be prepared differently to enhance its flavour.

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Wholegrain cereals

wholegrain The fibre-rich outer coating of bran, the central endosperm and the nutrient-packed inner germ of the grain.

phytochemicals Chemicals found in plants that can help to prevent disease.

Wholegrain cereals contain all three layers of the grain and are a rich source of many essential vitamins, minerals and **phytochemicals**.

The beneficial nutrients and phytochemicals found in cereals occur in the outer layers of grains such as wheat, rice, corn, millet, sorghum, barley, oats and rye.

Wholemeal foods are made from wholegrains that have been milled to a finer texture rather than being left whole in the final product. Nutritionally, wholegrain and wholemeal foods are similar.

Wholegrain cereal products include wholemeal or wholegrain breads or crispbreads, dark seedy breads, wholegrain breakfast cereals, wheatgerm, brown rice, puffed wholegrains, bulgar, popcorn and oatmeal.

6.11 ACTIVITY

Understanding dietary fibre

Wholegrain cereals and healthy eating

Eating wholegrain cereals, which include the outer layers, can make an important contribution to preventing diseases. The outer layers are rich in dietary fibre and have a number of other components that may help to prevent cancer and heart disease as well as other health problems. Fruit and vegetables are very valuable as part of a healthy diet, but it is important not to forget wholegrain cereals.

It is suggested that we substitute wholegrain or wholemeal cereals for at least half of the cereals eaten daily (bread, rice, breakfast cereals, etc.) instead of consuming whiter products.

Source: G. McIntosh, 'Cereal foods, fibre and the prevention of cancers', Australian Journal of Nutrition and Dietetics, (2001), 58: 35–48.

Read the information from this article and complete the following questions:

1. Use the knowledge that you have gained from this chapter and Chapter 4 to explain the function of dietary fibre in the body.
2. The outer layers of the wholegrain cereal are most beneficial in terms of health. Identify the nutrients that these layers contain.
3. It is suggested that we substitute wholegrain cereals for white and refined cereals. Make a list of 10 wholegrain products that you could consume instead of white and refined cereals.
4. Conduct some further investigating and find out how wholegrains can decrease the risk of heart disease and type 2 diabetes.

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Refined cereals

When grains are **refined**, milled or ground – for example, to produce white flour – the bran and germ layers generally are removed, leaving only the endosperm. This refining process results in the loss of many nutrients, including dietary fibre, vitamins, minerals and important phytochemicals. Refined cereals generally have a higher **glycaemic index (GI)** than wholegrain cereals. This means that eating refined cereals causes a sharp rise in blood sugars, demanding a strong response from the pancreas. Ultimately, excessive consumption of these food products can result in many diet-related health issues.

refined When the composition of the cereal grain is altered, the bran is often removed to make the cereal grain easier to use.

glycaemic index (GI) The ranking of carbohydrates according to their effect on our blood glucose levels.

Refined cereals include cakes, desserts, white bread, pasta, muffins, sweet or savoury biscuits, refined breakfast cereals, white rice, pancakes, waffles and pizza.

6.12 LET'S COLLABORATE

People who eat too many refined cereals often have health-related illnesses. Work with a group of two or three others to develop a list of these health issues.

6.13 LET'S COLLABORATE

With a partner, list 10 refined cereal products that you can think of. This is any food product that is made from a processed cereal grain.

Tasty Trivia

Sometimes the fibre that is added back into refined cereal products is from vegetable fibre. Some breads contain hi-maize, which is a resistant starch that comes from corn.

6.14 INVESTIGATE IT

Find out more about hi-maize by going to the Ingredion website. Use the internet to develop a list of food items that contain hi-maize.

Figure 6.6 Tip Top 'The One' bread, produced with resistant starch.

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6.15 ACTIVITY

Be a supermarket sleuth

1 Visit the supermarket or a supermarket website, then copy and complete the table below. Identify 10 different refined cereal products. Remember that ingredients had to be added to these products to make them nutritionally beneficial.

2 For each food item that you find, list any additives or preservatives that they contain.

3 Find out what additives and preservatives are. Explain the reason why they are added to foods.

	Food product	Ingredients added	Additives or preservatives found in this food product
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

4 Discuss whether or not it was hard to find these products in the supermarket. Explain why.

5 Of the 10 products that you listed:

- **a** Do you currently eat any of them?
- **b** Would you consider eating any of them? Explain why/why not.

6 Provide an outline of the different ingredients that are added to the cereal products. In your response, discuss the reasons why these ingredients are added.

7 Suggest why you think food manufacturers develop these products. (Is it really just to make us healthier?)

DESIGN BRIEF: AFTERNOON TEA BISCUITS

Your grandmother and other family members are coming for afternoon tea and you have been given the job of making biscuits that can be eaten with a cup of tea or coffee. Be aware when creating your solution that your aunt is allergic to any type of tree nut.

The recipe for Biscuits with a Crunch on p.151 is your starting point. Alter the recipe by adding ingredients or changing ingredients to produce your own Biscuits with a Crunch.

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Biscuits with a crunch

Main tools and equipment

Saucepan, measuring spoon, measuring cups, oven tray, tablespoon, fork, wire rack

Production skills

Combining, rolling

Cooking processes

Simmering to melt, baking

MAKES 16

Preparation time: 40 minutes

Cooking time: 5 minutes on the stove top, 10–15 minutes baking

Serving and presentation time: 5 minutes

Total time: 60–65 minutes

Ingredients

 75 g butter	 1 tablespoon golden syrup	 ½ cup brown sugar	¼ cup coconut
 1 cup rolled oats	 1 tablespoon flaked almonds, toasted	 ¼ cup flour	

Method

1. Melt butter, golden syrup and brown sugar in a saucepan.
2. Remove saucepan from the stove. Add the coconut, rolled oats, almonds and flour to the saucepan and mix until combined.
3. Lightly grease an oven tray.
4. Using a tablespoon, roll tablespoon-size balls of mixture.
5. Place each ball of mixture onto the oven tray, allowing room for the biscuits to spread.
6. Flatten balls with a fork.
7. Place the tray in the oven and bake at 180°C for 10 to 15 minutes or until lightly browned.
8. Cool on a wire rack.

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Biscuits with a crunch – continued

Evaluating

1 Provide the reasons why it is important to include cereals in your diet.
2 Explain the condition known as anaphylaxis. In your response, explain how this relates to tree nuts.
3 Discuss the function of the oats in digestion in the Biscuits with a Crunch recipe.
4 List the ingredients that you changed. Explain why you changed these ingredients.
5 Discuss how this would change the nutritional content of the biscuit.
6 Sensory activity: Complete a sensory analysis by describing the taste or flavour, texture, aroma and appearance of your biscuit.
7 Ask a fellow class member to taste-test your biscuit. Detail their sensory analysis.
8 Based on your sensory analysis and that of your fellow class members, critically evaluate your Biscuits with a Crunch.

REFLECT ON LEARNING

1 Name the three sections of a cereal grain.
2 Identify and explain the function of the three parts of the cereal grain that provide the greatest benefit to the body nutritionally.
3 Complete the table below to compare the wholegrain cereals and the refined cereals.

Wholegrain cereals	Refined cereals

4 Explain how refined cereal products can be made more nutritionally beneficial. Provide an example of a refined cereal product that has had its nutritional content improved.

6.4 A focus on nutrition: Chemical properties

Cereal grains are an excellent source of energy; they provide the body with large amounts of carbohydrates, starch, dietary fibre and protein. Wholegrains are also excellent sources of dietary fibre, essential fatty acids and B group vitamins.

Cereal grains supply the average person in Australia with about 20 per cent of their daily nutritional requirements.

Starch is the main carbohydrate found in cereals. Starch is a polysaccharide, a natural substance found in the cereal grain; when digested, it produces **glucose units**.

glucose unit A sugar energy source produced in plant products.

The nutrients found in cereal products depend on how they are processed and the amount of processing they undergo. If a cereal grain is milled, both the bran and the germ are removed. This leaves only the endosperm, which is the least nutritional part of the grain. Milling reduces the vitamin, mineral and dietary fibre content of cereal grains.

Wholegrain cereals contain many different phytochemicals that have been linked to significant health benefits. Lignans, for example, can lower the risk of coronary heart disease.

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Figure 6.7 Have you tried wholegrain pasta yet? It is much healthier than pasta made from refined flour.

Figure 6.8 Wholemeal flour is more nutritious than white flour, which has been through many processes.

6.16 ACTIVITY

All cereals are healthy, aren't they?

This activity requires you to find out just how healthy the breakfast cereals available in the supermarket really are.

Choose four breakfast cereals that are available at the supermarket. Perhaps you will need to visit the supermarket or you may just be able to use your pantry at home.

Record information from the back of the pack of four breakfast cereals, using the nutritional information panel. Copy and complete the table below for each of the breakfast cereals. Make a valid judgement about which breakfast cereal would give you the best start to the day. Explain the reasons for your choice.

Cereal 1:	
Price:	Total carbohydrate:
Servings per package:	Dietary fibre:
Serving size:	Sugars:
Energy:	Thiamin:
Protein:	Riboflavin:
Total fat:	Niacin:
Saturated fat:	Iron:
Sodium:	Folate:

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6.16 ACTIVITY continued

1 Suggest the cereal that provides the best value for money.
2 Identify the cereal that is lowest in:
   a fat
   b sodium
   c sugars.
3 Identify the cereal that is highest in fibre.
4 List the cereal that has the largest quantity of vitamins and minerals per serve.
5 Discuss the cereal that you would rank as the most nutritious overall. Explain the reason for your answer.
6 Thinking about sensory properties, which cereal would you rather eat? Explain the reason for your answer.
7 Think about the average serving size. Explain the serving size that you would have of this cereal. (You may need to use measuring cups to complete this question.) Explain how realistic the average serving size is.
8 Explain how this portion size should affect your evaluation of nutrition label information. Would you need to multiply the nutritional information by two or divide it? Prepare a new list of the nutritional information, taking the serving size that you would eat into consideration.
9 Identify the type of milk that you pour on your cereal.
10 Explain how this type of milk affects the nutritional value of the cereal.
11 Explain how much (if any) sugar you add to your cereal before eating it.
12 Explain the way in which added sugar affects the nutritional value of the cereal.
13 Discuss the following statement: 'Ready-to-eat breakfast cereals are a great way to break the overnight fast, but the choice of breakfast cereal, the processing it has been through, extra ingredients added and what we add to this cereal ourselves have a huge impact on its nutritional value.'

6.5 Cooking: The functional properties of cereals

Raw cereals cannot be taken in by the body – they are not very tasty and the body is unable to digest them. The cooking of cereal grains softens the outer bran layer of the grain and breaks this down in order to make it more digestible.

When cooking cereals using any method, except browning or toasting, it is always necessary to use liquid of some kind. The quantity used, however, varies with the kind of cereal that is to be cooked. Whole and coarsely ground cereals require more liquid than those that are finely crushed.

Cooking time also varies with the kind or form of cereal to be prepared. The coarse cereals require more time than the fine cereals. A good rule to remember when cooking cereals is that they should always be allowed to cook until they can readily be crushed between the fingers, but not until they are mushy in consistency.

6.17 LET'S COLLABORATE

1 Think quickly and list the dishes that can be made using rice. Compare your list with that of your partner and add those they have thought of that you didn't.
2 Have a class competition to see which partnership can develop the longest list.

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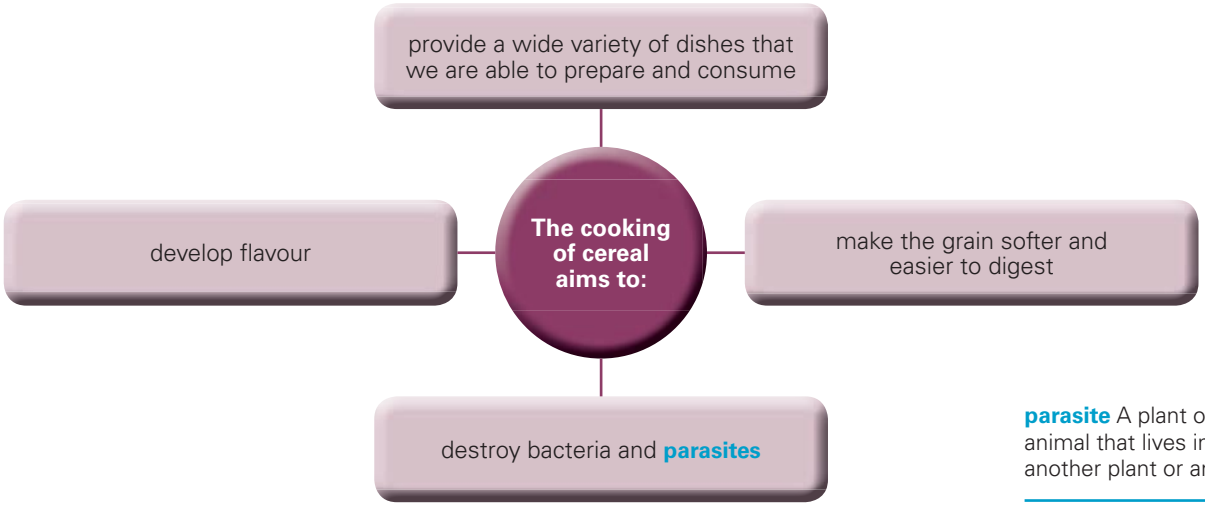

parasite A plant or animal that lives in or on another plant or animal.

Figure 6.9 The purpose of cooking cereal.

Figure 6.10 Compare the difference between the uncooked and the cooked grain – what do you observe?

REFLECT ON LEARNING

1. Explain the reason why raw cereals can't be digested by the body.
2. Identify how cooking alters cereal grains.
3. _____ is always required when cooking cereals (fill in the gap).
4. Identify the type of cereal grain – fine or coarse – that requires more cooking time. Discuss the reason for this.
5. Explain how we know when a cereal is cooked. In your response, detail what has occurred during the cooking process.

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Check out wheat

Wheat is the most commonly grown cereal in the Western world. The wheat grain is milled to provide flour and can be processed to make many other products, including breakfast cereals.

Wheat originated in the Middle East, in an area called Mesopotamia, now part of Iraq. People have been growing wheat for thousands of years. Australia's first wheat was grown in the area that is now the Botanic Gardens in Sydney. The first farmer of wheat was a convict by the name of James Ruse. During the nineteenth century, wheat farms were established in all the Australian colonies.

Tasty Trivia

About 25 000 farms in Australia grow wheat as a major crop. Depending on the variety, sowing starts in mid- to late April and ends in May/June. If the soil is moist, the wheat seeds will sprout in five to seven days and take five to seven months to mature. Discuss the impact that weather or other climate-related factors can have on wheat production.

Uses for wheat

Wheat is **milled** into flour and other products, and these are used to make many types of food. Bread is one of the oldest and most diverse foods that is made from wheat. Biscuits, cakes, pastry dough made for biscuits, Middle Eastern flat or pocket breads, pasta and noodles are all produced from wheat.

milling The process that makes cereal grains into flour or meal.

Tasty Trivia

Gluten and **starch** are the two main components of flour. They are found in an amazing number of commercial products. Gluten is found naturally in flour and is used to make better breads and buns. It is also used in pet food, smallgoods, glues and other chemicals. Starch has many uses, including in confectionery, soft drinks, cordials, food thickeners, glue and paper making.

gluten A mixture of two different types of protein found in cereal grains.

starch A carbohydrate made in plants that provides energy to the human body.

Flour

Flour that is used in baking comes mainly from wheat, although it can be milled from corn, rice, nuts, legumes and some fruits and vegetables. The type of flour used is vital for getting the product you are making right. Different types of flour are suited to different recipes and all flours are different. You cannot switch from one type

Figure 6.11 Australian wheat was first grown on the site of what is now the Botanic Gardens in Sydney.

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Figure 6.12 General-purpose wheat-growing areas of Australia.

of flour to another without consequences that could ruin the recipe. To achieve success in baking, it is important to know what the right flour is for the job.

The different types of flour products are outlined in Figure 6.13.

Tasty Trivia

The wheat weevil (also known as the grain or granary weevil, *Sitophilus granarius*) damages stored cereal grains. Weevils are often found in cereal and grain products. They can sometimes be seen when opening a bag of flour, although they will also infest most other types of grain, including oats, barley and breakfast cereals. If ingested, *E. coli* infection and various other diseases can be contracted from weevils, depending on their diet.

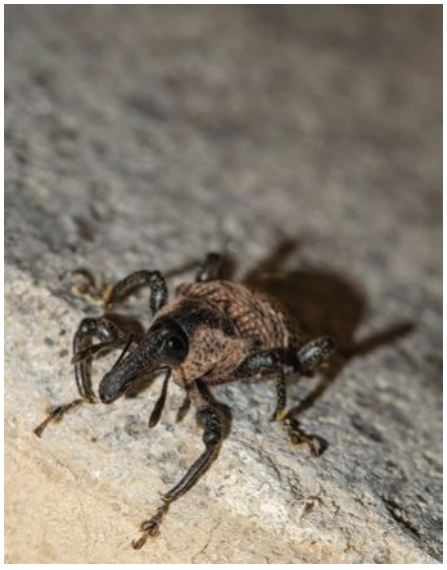

Figure 6.14 Weevils damage stored cereal grains.

Flour product	How is it produced?	Uses in cooking
Plain flour (all-purpose flour)	All-purpose flour is a blend of hard and soft wheat; it may be bleached or unbleached. All-purpose flour is one of the most commonly used and readily accessible flours in Australia.	Cakes, biscuits, scones, batters, food thickeners and coatings
Self-raising flour	Self-raising flour is low-protein flour with salt and a **leavening** agent already added. *Remember*: if a recipe requires self-raising flour, do not add extra salt or leavening agents.	Biscuits, quick breads, muffins
Wholemeal flour	This type of flour is made from the whole kernel of wheat and is higher in dietary fibre and overall nutritional content than white flours. It does not have such a high gluten level, so often it is mixed with all-purpose or bread flour when making yeast breads.	Bread, biscuits, scones
Bread flour	Bread flour is white flour made from hard, high-protein wheat. It has more gluten strength and protein content than all-purpose flour. It is unbleached and sometimes conditioned; this increases volume and creates better texture.	All types of bread products
Semolina flour	Semolina is made from durum wheat, the hardest type of wheat grown. This type of flour has the highest gluten content.	Pasta, Italian puddings

leavening A raising agent that is added to cereal products like bread to make them rise.

Figure 6.13 A range of different flour products

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CREATE A SOLUTION

There are many different types of flour. Each can make a wide variety of food products.

1 Choose one of the flour types from the list below:

- arrowroot flour
- banana flour
- barley flour
- buckwheat flour
- cassava flour
- chickpea flour
- cornflour
- gluten-free flour
- potato flour
- rice flour
- rye flour
- tapioca flour
- taro flour.

2 Investigate the flour and then create a final food item that you can share with your class. Identify the cereal grain or other plant food from which the flour type originates and the country that makes the most use of this flour type.

3 List five dishes/recipes that can be prepared using this flour. Explain the reason why this type of flour is most suitable for these dishes/recipes.

4 Choose one recipe using this flour type and then explain the decision-making process you used. Justify why you chose this recipe.

5 Produce this recipe in class and share your final food item with your fellow students.

6 Reflect on your decision-making process and critically evaluate how you could change or adapt this recipe if you were to produce it again.

DESIGN BRIEF: BREAD AROUND THE WORLD

There are many different types of breads consumed throughout the world. Think about the different types of bread that you have eaten – damper, quick bread, cornbread, naan, tortilla and flatbread, just to name a few.

The Turkish Bread recipe on p.159 is quick and easy. Your task is to prepare the Turkish Bread and then work with a partner to find a dip recipe for it that could be eaten with your Turkish Bread, then prepare it. You should complete a food order for your teacher so that the correct ingredients can be purchased for your dip.

Hint: if time does not allow you to search for a dip recipe, have a go at preparing the Hummus dip in Chapter 9.

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Turkish bread

TURKEY

Main tools and equipment

Food processor, measuring cups, measuring jug, measuring spoons, bowl, plastic wrap, oven tray, pastry brush

Production skills

Greasing, processing

Cooking processes

Dry method – baking

MAKES 1

Preparation time: 40 minutes

Cooking time: 15 minutes

Serving and presentation time: 5 minutes

Total time: 60 minutes

Ingredients

 1¾ cups plain flour	 1 teaspoon salt	 1 teaspoon dried yeast	1 cup warm water
 ¼ cup rice flour	 ¼ cup milk	 1 tablespoon sesame seeds	

Method

1. Preheat the oven to 220°C.
2. Place flour, salt, yeast and water into a food processor and mix for 10 minutes.
3. Cover bowl with plastic wrap and allow it to sit for 20 minutes in a warm kitchen. This mixture will look very sticky, like glue.
4. Lightly grease an oven tray.
5. Pour the mixture very gently to make an oval shape on the oven tray. It is important to be very gentle here as you do not want to pop all the gas bubbles that have formed.
6. Sprinkle with the rice flour.
7. Brush very gently with milk.

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Turkish bread – continued

8 Sprinkle lightly with sesame seeds.

9 Bake in the oven for 12 to 15 minutes.

Evaluating

1 Working with yeast can sometimes be tricky. Thinking about the method used for this recipe, explain the condition that yeast needs to grow.

2 Describe what happened when you left the bread mixture to sit or rest. Why is this important?

3 Analyse the sensory properties of your bread. Provide a discussion of taste, texture, aroma and appearance.

4 Discuss the type of dip you used as an accompaniment for your Turkish Bread.

5 Reflect on the decisions that you made and your level of skill, and explain how you could improve your skills if you were to repeat this production.

Let's cook pasta

Did you know pasta originally came from Asia? The Chinese were the first real inventors and owners of pasta; history tells us that they have been eating pasta since 5000 BCE. Their egg noodles were the first type of pasta to be consumed. Today, it is the Italians who are best known for the pasta they make.

6.18 LET'S COLLABORATE

With a partner, list as many different pasta types as you can think of.

Tasty Trivia The word 'pasta' comes from the Italian word for 'paste', meaning a combination of flour and water.

Pasta should be cooked ***al dente***. This means 'to the tooth' – in other words, not too soft, but chewy with some bite or texture to it.

al dente Cooked 'to the tooth' – not too soft, but chewy with some bite or texture to it.

Pasta is made from durum wheat. This is a wheat variety that is extremely hard and has a yellow endosperm. The wheat is coarsely milled, mixed to a stiff dough, extruded into shapes and dried to form the different pasta varieties that we know. The dough can also include cooked vegetables such as spinach or tomato to add extra variety. Wholegrain pasta is made from whole wheat.

Tasty Trivia This illustration, of two women making pasta, first appeared in a 15th century health handbook which was the Latin translation of an 11th century medical text in Arabic, written by Ibn Butlan of Baghdad. The methods used to make pasta have not changed for many centuries.

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Making pasta

Making pasta is very easy. Fresh pasta can be made quickly with very few ingredients. To make fresh pasta, all that is required is durum wheat flour and eggs, which are formed into dough. The dough is kneaded until it is very firm and is then rolled into sheets before it is cut into the desired shape.

Figure 6.15 Kneading the dough to the right consistency is crucial to making pasta.

6.19 ACTIVITY

Pasta varieties

Look at the picture of the pasta varieties in this photograph. See whether you can name the varieties.

DESIGN BRIEF: SPAGHETTI BOLOGNESE

Spaghetti Bolognese is a favourite Italian dish for many people. The main ingredient in this dish, as you will see from the recipe on p.162, is minced meat. This task requires you to alter the recipe to create a dish that is suitable for someone who does not eat red meat.

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Spaghetti Bolognese

ITALY

RECIPE

Main tools and equipment

Knife, measuring spoons, measuring jug, saucepan, wooden spoon

Production skills

Stirring, straining, dicing, grating

Cooking processes

Boiling, simmering, sautéing, browning, reducing

SERVES 2

Preparation time: 30 minutes

Cooking time: 30–40 minutes

Serving and presentation time: 5 minutes

Total time: 65–75 minutes

Ingredients

 ¼ tablespoon olive oil	 ½ clove garlic, crushed	 ½ small onion, diced	 150 g steak mince	 ¼ teaspoon dried oregano	 100 g crushed tomatoes
 ½ cup water	 2 tablespoons tomato paste	 ¼ teaspoon beef stock powder	 ¼ teaspoon black pepper	 125 g spaghetti	 25 g parmesan cheese, grated

Method

1. Heat olive oil in a saucepan.
2. Add garlic and onion. Sauté for two minutes, stirring occasionally.
3. Add the mince, cook until browned.
4. Add the oregano, tomatoes, water, tomato paste, stock powder and black pepper. Stir to combine all ingredients.
5. Bring to the boil, reduce heat and simmer for 15 minutes until the sauce is reduced.
6. While the Bolognese sauce is simmering, half fill a medium saucepan with water. Bring the water to the boil.
7. Once the water is boiling, add the spaghetti and cook until *al dente*.

8. Strain the water from the spaghetti and serve with Bolognese sauce and grated parmesan cheese. Garnish with basil.

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REFLECT ON LEARNING

1. Discuss how widespread the cultivation of wheat is in Australia.
2. List some of the products made from wheat.
3. Define the terms 'gluten' and 'starch'. Explain why these are so important in bread making.
4. Explain the reason why the right flour type is so important when following a recipe.
5. Identify the type of flour used to make pasta.

Check out rice

Rice has been a staple food in Asian countries for many centuries, and there are thousands of varieties grown. Two major types of rice are long-grain rice, which separates easily after cooking, and short-grain rice, which produces firm grains that tend to stick together.

6.20 ACTIVITY

Rice dishes around the world

Figure 6.16 The rice plant

Using the internet, develop a list of the types of dishes that are prepared using rice. For each rice dish, state the country where the dish originated.

Figure 6.17 A rice field in Asia.

Tasty Trivia

The botanical name of the rice plant is *Oryza sativa*. There are two major sub-species: *Japonica* (the sticky, short-grained variety) and *Indica* (the non-sticky, long-grained variety).

Rice remains a staple food for the majority of the world's population. More than two-thirds of the world's people rely on the nutritional benefits of rice. Rice is naturally free of any fat, **cholesterol** and sodium, and it contains large quantities of carbohydrates, which are essential for energy.

cholesterol A waxy, fat-like substance used by the body to build cell walls. It is either produced in the liver or absorbed from animal fats eaten. It is necessary for good health; however, excess levels are detrimental.

REFLECT ON LEARNING

1. List two rice types used in Asian cooking.
2. List the nutritional benefits of rice.
3. Draw and label a rice grain.
4. List some other uses for rice throughout the world.
5. Use a Venn diagram to compare and contrast brown rice and white rice.

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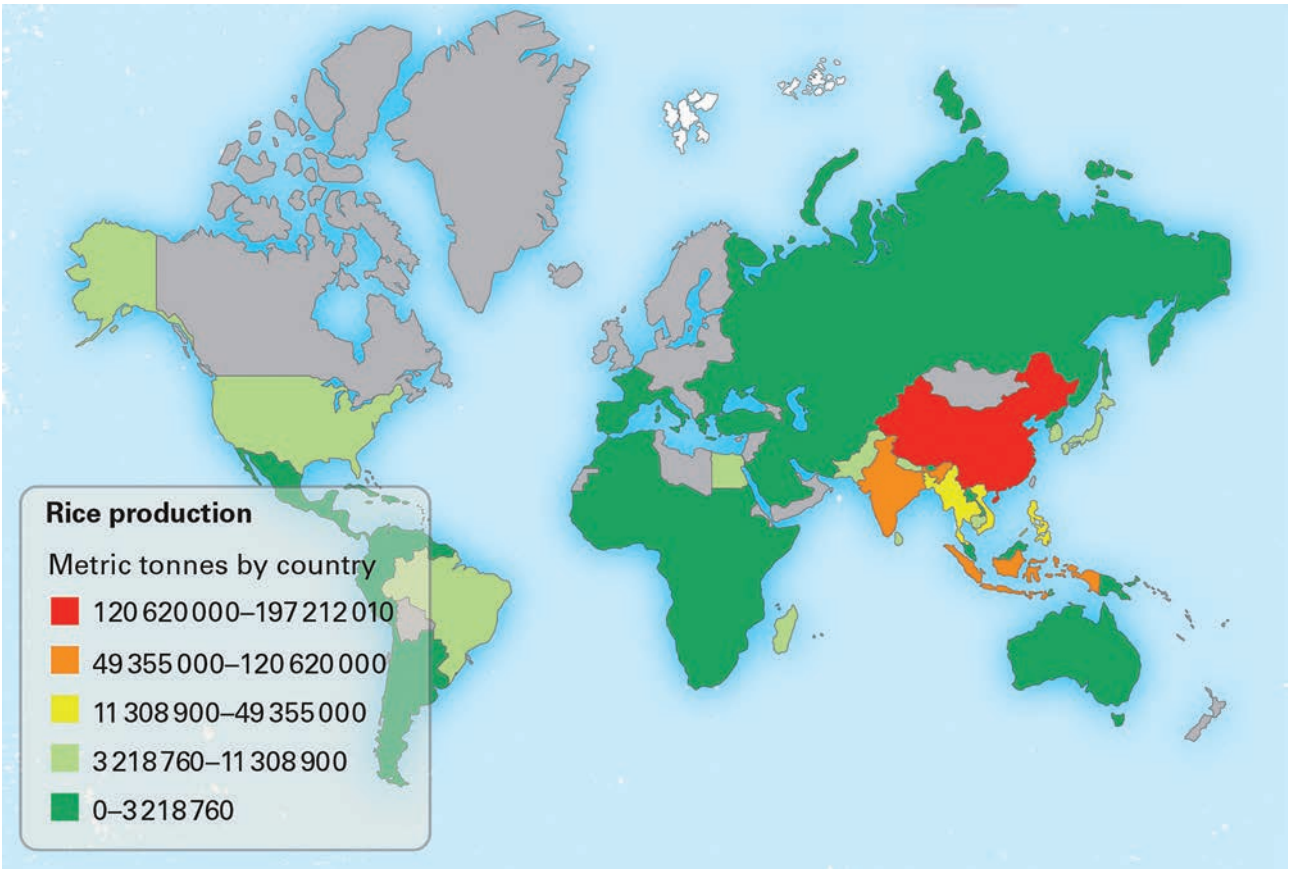

Figure 6.18 Rice is produced in many different countries all around the world.

6.21 ACTIVITY

Growing rice

The way in which rice is grown, the labour required and the equipment used are very different in Australia compared with other parts of the world. Compare how rice is grown in Australia with the way it is traditionally grown in many parts of Asia. In your response, include a comparison of:

1. traditional versus modern means of rice growing
2. use of water
3. land used to grow the rice
4. use of labour
5. environmental sustainability
6. cost of production – consider labour in your response.

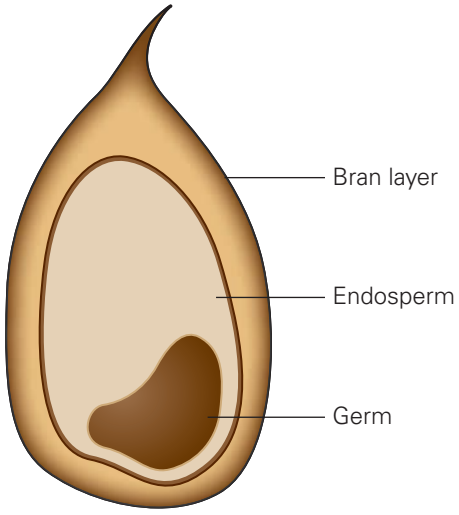

Figure 6.19 The rice grain

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Best quality: Check out the grain

When purchasing grain products, look to see whether:

- the package is well sealed and undamaged
- the product has a long use-by date – never buy a cereal or grain product that is out of date. If stored properly in a cool, dry place, cereal products can last for up to two years.
- the product and package are free from weevils and other insects
- the product inside is dry – there should be no moisture evident.

6.22 ACTIVITY

Rice dish origins

Look at the list of rice dishes in the table below and match the country with the dish.

Rice dish	Country of origin
Fried rice	China
Sushi	India
Congee	Spain
Pilaus (Dhosas)	China
Paella	Persia
Kedgeree	Africa
Jambalaya	China
Risotto	India
Eight treasures rice	Iran
Pilavi	Japan
Sabsi pilau	Italy
Arroz doce	France
Gateau au riz	Portugal

Tasty Trivia

Adding value to the rice crop

- Sake is wine made from rice.
- Clothing, including shoes and hats, is made from rice straw in many rice-production areas of the world.
- Rice paper is not actually made from rice; it comes from the pith of the rice paper tree, which is grown in Asia.
- Rice glue is still made in many countries by boiling ground rice.

6.23 ACTIVITY

Sensory analysis: Brown rice, white rice, wild rice

Investigate and conduct a sensory analysis of three different types of rice: brown, white and wild rice.

1. Explain how each type of rice is grown.
2. Develop a list of recipes/dishes that use the three different varieties of rice.
3. List the nutritional benefits of each type of rice.
4. Cook each type of rice in class. Complete a sensory analysis. Consider appearance, aroma, taste/flavour and texture. When completing your sensory analysis, remember that you should highlight the differences between the rice varieties.

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6.24 INVESTIGATE IT

Sunrice is one of the major rice companies in Australia. Browse the Sunrice website to find out about all things rice.

1. Develop a list of the rice products that have been developed and then sold by Sunrice.
2. Use the tab 'Journey of rice' on the Sunrice page to investigate the journey that two different types of rice have taken before arriving on our plates. Draw a flow chart to summarise this journey.

Rice product	What is it?
Brown rice 	This has only the husk or hull removed. Due to the limited processing, brown rice is more nutritional than other varieties. Brown rice does not get milled, so it retains its darker colour. Brown rice contains carbohydrates, protein and dietary fibre, and is a good source of thiamin, niacin, riboflavin, iron and calcium. Traditionally, brown rice is the least favourite of all the rices, because of its much harder texture.
White rice 	White rice is by far the most common type of rice, consumed in all countries of the world. White rice is de-hulled and has all bran and germ layers removed. The two types are: • long grain white rice: long slender kernels that produce light, fluffy rice • short grain white rice: short, round kernels that are soft and cling together when boiled.
Basmati rice 	A long-grain, aromatic rice traditionally from Pakistan.
Jasmine rice 	Has a fragrant perfume and is most often used in Thai cooking.
Arborio rice 	Large tan grains with white dots in the centre. This rice is most often used in risotto because of its creamy, chewy texture and its ability to absorb four to five times its weight in liquid.

Figure 6.20 The different rice varieties

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Rice product	What is it?
Waxy rice 	Also known as 'sweet' rice. Kernels are short and plump, and produce a thick, starchy product when cooked. Waxy rice is most often used as a binder for gravy, sauces or fillings.
Rice flour 	A ground rice product made into flour. It is used in biscuits and also as a thickener.
Quick cooking (parboiled) rice 	This rice has been precooked and then dried, and has a much shorter cooking time than other rices.
Rice bran 	The ground husk of the rice grain. This product is naturally sweet and very high in dietary fibre.
Wild rice 	Wild rice is a coarse grass (and not really a true rice) and is considered a delicacy in many parts of the world. North American Indians are attributed with the introduction of wild rice into mainstream society. Grown in shallow waters, the wild rice plant is 1–10 metres tall, holding the traditional rice flower at its peak.

Figure 6.20 The different rice varieties (continued)

DESIGN BRIEF: FRIED RICE

Fried Rice can include many different ingredients, which often depend on the culture of the person preparing it. Design and create your own Fried Rice using the recipe on p.168 as a starting point.

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Fried rice

CHINA

RECIPE

Main tools and equipment

Knife, measuring spoon, measuring cups, fork, frying pan, wooden spoon

Production skills

Cutting, slicing, beating

Cooking processes

Stir-frying

SERVES 2

Preparation time: 30 minutes

Cooking time: 15–20 minutes

Serving and presentation time: 5 minutes

Total time: 50–55 minutes

Ingredients

 1 tablespoon canola oil	 1 tablespoon peanut oil	 1 egg, lightly beaten	 Salt and pepper	 1 small white onion, cut into wedges	 125 g ham, diced
 2 cups cooked rice	 ¼ cup frozen peas	 1 tablespoon soy sauce	 2 spring onions, sliced	 50 g tofu, diced	 ¼ cup bean sprouts

Method

1. Heat half of the oils (combined) in a wok or large frying pan.
2. Season the beaten egg with salt and pepper, pour into wok and cook until set.
3. When it has set, use a wooden spoon to break up the egg so that it looks like scrambled eggs, then remove from wok.
4. Heat the remaining peanut and canola oils in the wok, add the white onion and stir-fry over a high heat until transparent.
5. Add the ham and tofu and stir-fry for 1 minute.
6. Add the rice and peas, stir-fry for 3 minutes until the rice is heated through.
7. Add the egg, soy sauce and spring onions. Mix and heat through.
8. Serve with bean sprouts sprinkled over the top.

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LOOKING BACK

1 Cereals are the edible grains or seeds of the grass family and are dietary staples in many countries throughout the world.

2 There are three main parts of a cereal grain: the bran, the endosperm and the germ. Wholegrain cereals contain all three layers of the grain, while refined cereals have the bran and germ layers removed.

3 Cereal grains are an excellent source of energy with no saturated fat. The nutritional benefit of cereals depends on the number of processes to which they have been subjected.

4 Cereals must be cooked. Cooking time varies, depending on the type of cereal grain.

5 Wheat and rice are two very versatile examples of cereal grains eaten worldwide. Wheat is important to the Australian diet and economy; it is processed into flour, which has many uses in cookery. Rice, whether it has a long or short grain, is also used in a wide range of dishes/recipes throughout the world.

TEST YOUR KNOWLEDGE

Multiple choice

1 All cereal grains can be:

- **a** cooked in liquid
- **b** cooked in the microwave
- **c** toasted
- **d** eaten without being cooked.

2 Rice provides large quantities of carbohydrates. It is also naturally free of:

- **a** fat, cholesterol and sodium
- **b** dietary fibre
- **c** starch
- **d** all of the above.

True/false

1 Rice and amaranth are both examples of cereal grains.

2 Refined cereals are more nutritionally sound than wholegrain cereals.

3 Protein is the main carbohydrate found in cereals.

Short answer

1 Flour is a versatile ingredient that can be used in many different ways. Choose one type of flour and explain how it is produced.

2 A large number of different types of rice exist. They are all cooked in their own special ways and combined with many different ingredients. If you were to make a risotto, what type of rice would you choose? Suggest why this is the most suitable type of rice.

3 Explain why you should not eat raw grains.

Extended response

Cereal grains are refined into many other products.

1 Explain what it means to refine a cereal grain.

2 List the processes through which a refined cereal may go.

3 Explain why this is not the best way to consume a cereal grain.

4 List five refined cereal products.

5 Explain the way in which one of these cereal products has been altered from the original cereal grain.

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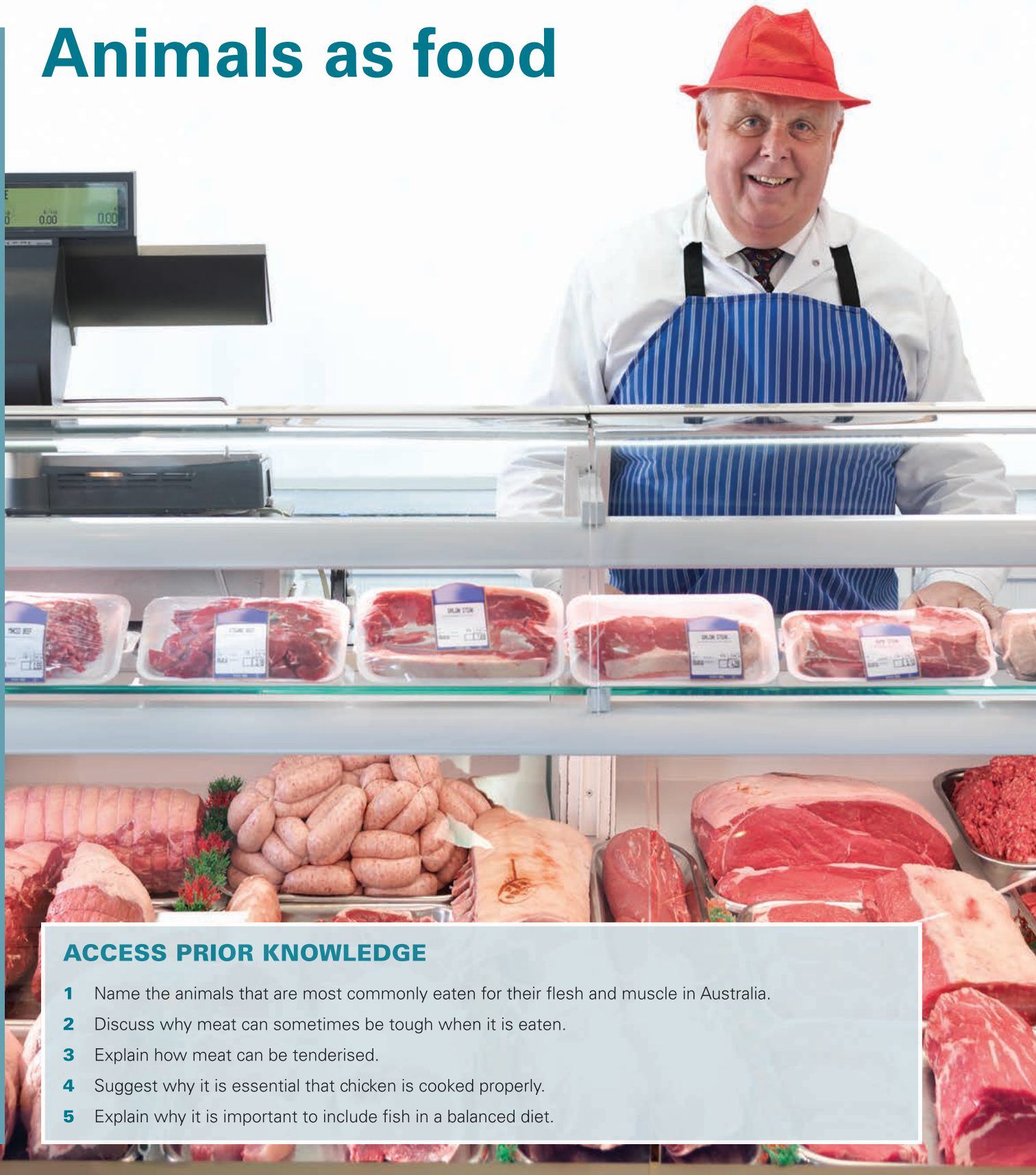
CHAPTER 7

Animals as food



ACCESS PRIOR KNOWLEDGE

1. Name the animals that are most commonly eaten for their flesh and muscle in Australia.
2. Discuss why meat can sometimes be tough when it is eaten.
3. Explain how meat can be tenderised.
4. Suggest why it is essential that chicken is cooked properly.
5. Explain why it is important to include fish in a balanced diet.

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7.1 Meat: The basics

Meat is the edible part of the flesh or muscles of animals. In Australia, we most commonly eat the meat from cattle, sheep, chicken and pig. Many people also eat rabbit, deer, kangaroo, goat or birds such as duck.

meat The flesh of an animal that is edible.

7.1 LET'S COLLABORATE

What animals provide food for humans? With a partner, discuss which animals provide us with lamb, beef, pork, venison, bacon, ham, mutton and veal.

History of meat

People have been hunting and consuming meat for thousands of years. Farms began to develop in Australia in the first few decades after European settlement. When the First Fleet arrived in Australia, it was carrying two bulls, six cows and 44 sheep, together with pigs, goats and poultry. So began farming in Australia. In terms of meat, these farms mainly raised sheep that originally had been brought over from Europe. In 1900, beef and dairy cattle became important in terms of farming for food.

livestock Breeds of animals that are regarded as an asset.

The grazing of **livestock**, sheep and cattle takes up a lot of the land in Australian agriculture.

Figure 7.1 These animals are all commercially farmed in Australia.

Figure 7.2 The main livestock populations of each state in Australia.

Sustainable table

RSPCA – Better beef cattle welfare

The RSPCA has developed a vision for cattle farmers to implement principles and practices designed for continual improvement in animal welfare for all beef cattle farms. The principles are based on the Five Freedoms:

1 Freedom from hunger and thirst
2 Freedom from discomfort
3 Freedom from pain, injury or disease
4 Freedom to express normal behaviour
5 Freedom from fear and distress.

Find out more about Beef Cattle Welfare on the RSPCA website.

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7.2 Structure of meat: Physical properties

Meat is made up of tiny muscle fibres that are held together by connective tissue or **collagen**. The three main structures of meat that can be seen under a microscope are shown in Figure 7.3.

collagen A long, stiff protein that is made up of three separate molecules composed of amino acid chains, twisted around each other. The more collagen there is in a piece of meat, the tougher it is to chew and eat.

slaughter The killing of an animal for its meat.

carcass The slaughtered body of an animal killed for its meat.

aged Describes the meat of a slaughtered animal that is left to hang for a period of time to increase its tenderness.

Tenderness of meat

The way in which an animal is raised and **slaughtered** influences how tender the final product will be. When an animal is slaughtered, the **carcass** becomes stiff due to the chemical changes in the body of the animal after death. After approximately six hours, the carcass returns to normal as the muscles relax under the influence of other body chemicals. After this period of time, the meat can be **aged** for five days and up to two weeks. During the time the meat is allowed to age, muscle fibres break down, causing the meat to become more tender. The practice of hanging a carcass helps this process.

Fresh meat can be tenderised before cooking by physically changing the muscle fibres and the connective tissues of the meat. This is done by mincing, dicing, pounding or slicing it. Meat can also be made more tender by chemical methods, such as marinating the meat with ingredients such as oil, soy sauce, even garlic and ginger. Marinating meat helps to make meat tender but it is also one of the best ways to give it more flavour.

Tasty Trivia

The fat layer under the skin of an animal serves the same purpose as the layer of fat underneath the skin of humans: to provide warmth and protection. Marine mammals have a particularly thick layer of fat, called blubber. Why do you think they have such a thick layer of fat?

7.2 LET'S COLLABORATE

As a class, name the types of meat produced by:

- livestock in Queensland and New South Wales
- livestock in Victoria and Western Australia.

REFLECT ON LEARNING

1. Define the term 'meat'.
2. Make a list of the animals we eat for meat.
3. Where did Australia's first sheep come from?
4. Name the places where Australia's beef producers are located.

Connective tissue: the tissue that holds the muscle fibres together. This tissue is made up of a protein substance called collagen. The collagen is thicker in the parts of an animal that have the most activity. The collagen is the tough part of the meat.

Muscle fibres: the bundles of meat strands that are made up of protein and water. These strands make up the muscles of the animal.

Fat: small amounts of fat found between meat fibres. There is also a thick layer of fat underneath the skin.

Figure 7.3 The structure of meat

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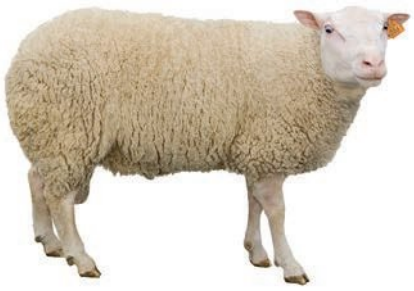
7.3 INVESTIGATE IT

Tough and tender: Sheep and cows



Look at the pictures of the cow and the sheep. Use the internet to research which parts of these two animals would be tough and use a pencil to mark them on the pictures above. Place a tick on the sections that would be tender.

Tasty Trivia

Game birds are wild birds that are hunted for sport. Some examples of these are pheasant and grouse.

There are so many different meat products

The three main classes of mammals bred for human consumption in Australia are cattle for beef and veal; sheep for lamb and mutton; and pigs for pork, ham and bacon. Here are some interesting facts about meat:

- Meat is named according to the animal from which it comes and the length of time for which the animal has lived.
- Beef and veal are the meat from cattle. Veal comes from an animal that is approximately six months old; the meat is white to pale pink in colour and has a very small amount of fat.
- Yearling beef is approximately one year old. It has a deeper pink colour, firm flesh and clearly visible fat.
- Sheep give us lamb; spring lamb comes from an animal that is up to 12 months old, with a pink flesh and creamy-looking fat.

Figure 7.4 Carcasses are hung to age the meat.

Figure 7.5 Pounding meat is only one of many ways to tenderise it.

- Pork comes from pigs. These animals are approximately six to nine months old; the flesh is pale pink and the fat is white in colour. Pork can be purchased in many different ways – fresh, smoked or salted – and it is used in sausages and many other smallgoods.

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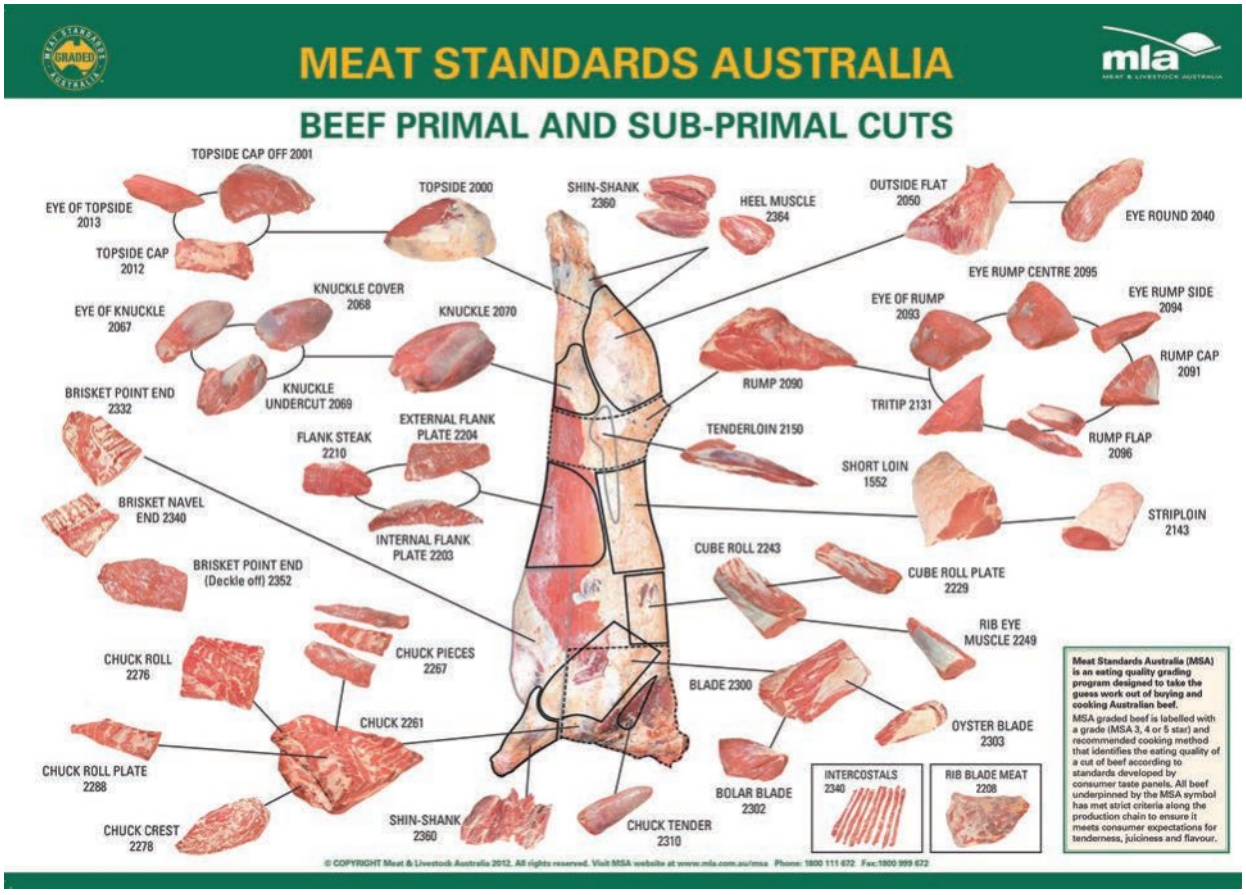

Figure 7.6 A wide variety of meat cuts is available. Identify the cuts that you do not know and find out how they can be cooked.

7.4 ACTIVITY

Eating wild animals

1 Many other types of animals are hunted or raised for their meat. Investigate the farming of one of these animals:

- buffalo
- crocodile
- deer
- duck
- emu
- goanna
- goose
- possum
- quail
- rabbit
- wallaby.

2 Produce a visual display to explain the following:

a List and describe the cultures that mainly eat the animal chosen.

b List the physical properties of the meat when it is raw and also when it is cooked.

c Compare the nutritional value of beef and the animal you are investigating.

d Detail the price you would expect to pay per kilogram for this type of meat.

e Suggest four recipes or meals that could be prepared using this animal.

f Explain the 'traditional' method used for cooking this animal.

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7.5 ACTIVITY

Meat around the world

Meat is used in a wide range of recipes and dishes from around the world. Copy and complete the table below to match the type of meat with the dishes from around the world. Think about each of the recipes and see whether you can list two other ingredients included in each of the dishes. An example is provided to get you started.

Dishes from around the world	Type of meat used	Two other ingredients included in this dish
Barbecue spare ribs	Pork ribs	Chinese five spice, brown sugar
Spaghetti Bolognese		
Fajitas		
Rogan josh		
Massaman curry		
Shish kebab		
Wiener schnitzel		
Stroganoff		
Burger		
Chilli con carne		
Pâté		
Meat pie		
Paella		

DESIGN BRIEF: KANGAROO AND LEEK PIES

The Kangaroo and Leek Pies recipe on p.176 is going to be produced by the local gourmet pie shop. It is looking for two new pies to sell. You have been asked to develop another pie using the recipe as a starting point. The pie is to contain meat, but it should not be beef, and it must also contain at least one vegetable.

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Kangaroo and leek pies

AUSTRALIA

RECIPE

Main tools and equipment

Knife, measuring cup, measuring spoon, measuring jug, fork, scale, chopping board, frying pan, 6-hole large muffin tray

Production skills

Dicing, slicing, chopping, beating

Cooking processes

Frying, baking

SERVES 2 (6 SMALL PIES)

Preparation time: 30 minutes

Cooking time: 20 minutes stove top, 20 minutes baking

Serving and presentation time: 5 minutes

Total time: 75 minutes

Ingredients

 10 g butter	 100 g kangaroo meat, diced	 100 g button mushrooms, cut into quarters	½ leek, thickly sliced	¼ cup red wine vinegar	½ tablespoon plain flour
 ½ cup sour cream	 ½ tablespoon Dijon mustard	 ½ tablespoon rosemary, chopped	2 sheets ready-rolled puff pastry	1 egg, lightly beaten	

Method

1. Preheat oven to 180°C.
2. Melt half the butter in a non-stick frying pan.
3. Cook the kangaroo meat until it is browned all over. Remove the meat from the frying pan and place on a plate.
4. Melt the remaining butter in the frying pan.
5. Add the mushrooms and leek, stir and lightly fry for about 5 minutes until the leek is transparent.
6. Add in red wine vinegar and flour, stir until the mixture boils and thickens.
7. Stir in the kangaroo, sour cream, mustard and rosemary.
8. Lightly grease a six-hole large muffin tray.

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9 Cut the pastry into six circles large enough to fill the muffin tray circles. Gently place pastry into the muffin tray to make the pastry cases.

10 Divide the filling evenly among the six pastry cases.

11 Cut six more rounds to fit as lids on the tops of the pies.

12 Top the pies with the pastry lids. Brush with egg wash. Use a fork to decorate the edges and pierce the pastry cases twice.

13 Bake in the oven for 20 minutes or until the pastry is lightly browned.

Note: If kangaroo is unavailable, substitute diced lamb, beef or even chicken.

Evaluating

1 Explain why you chose the pie ingredients for your design brief.

2 Identify what was difficult about this production task.

3 Make a list of the processes that you needed to carry out in order to complete this task.

4 List the skills you need to carry out these processes. Critically evaluate your level of skill.

5 List two safety and two hygiene procedures that you followed during this production task.

6 Suggest any safety procedures you did not follow that you believe you should have.

REFLECT ON LEARNING

1 List the three main structures of meat.

2 Discuss the component of meat that makes it tough.

3 Identify the sections of a cow that will produce tough meat. Explain why this is the case.

4 Explain how it is possible to make meat more tender.

5 Compare the age and appearance of spring lamb and pork.

Physical properties of meat

When you buy meat, make sure it comes from a healthy animal by checking for specific physical characteristics, shown in Figure 7.7.

- Beef should be a bright red colour, and be moist and firm with white-coloured fat.

- Veal should be pale pink in colour and have no or few signs of fat.

- Pork should be a bright pale-pink colour, and be moist with soft-looking white fat.

- Lamb should look bright pink in colour, and be moist and tender with the fat looking hard and pale in colour.

- Mutton should look dark red in colour with yellowish coloured fat.

Figure 7.7 The physical appearance of meat will vary depending on the cut and the animal from which it comes.

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7.3 Nutritional value of meat: Chemical properties

The nutritional value of meat depends on the type of animal and the part of the animal that is eaten. The muscle tissue of meat is high in protein; it contains all of the essential amino acids and is a good source of iron and B group vitamins.

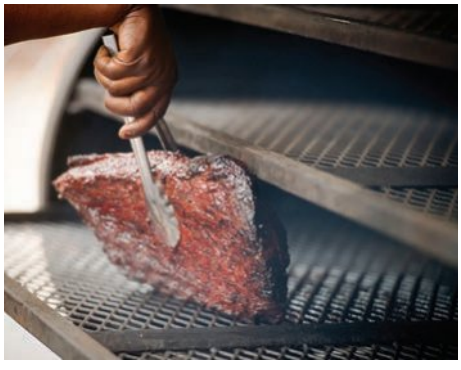
Meat – particularly red meat – can be high in saturated fat. The fat content of meat varies widely, depending on the species and breed of the animal, the way in which it was raised and the methods of butchering and cooking used.

You will learn more about saturated fats in Chapter 10.

7.6 ACTIVITY

Good health = lean meat

1. In which section of the Healthy Eating Pyramid does meat belong?
2. Explain why you believe that this is the case.
3. Outline the reasons why it is so important to eat lean meat.
4. The consumption of red meat products has decreased over the last 20 years. Discuss the reasons why you think this has occurred.



5. Explain two ways in which meat could be cooked so that its fat content can be kept to a minimum.

7.7 LET'S COLLABORATE

Wild animals such as deer are typically leaner and therefore contain less fat than farmed animals. Discuss the reasons why you think this is the case.

7.4 Cooking meat

The cooking of meat helps to obtain a **palatable**, high-quality product. Tough cuts of meat need to be cooked slowly in liquid to soften the meat fibres. Tender cuts of meat should be cooked quickly without liquid as muscle fibres are softer.

palatable Having a good taste or mouthfeel when eaten.

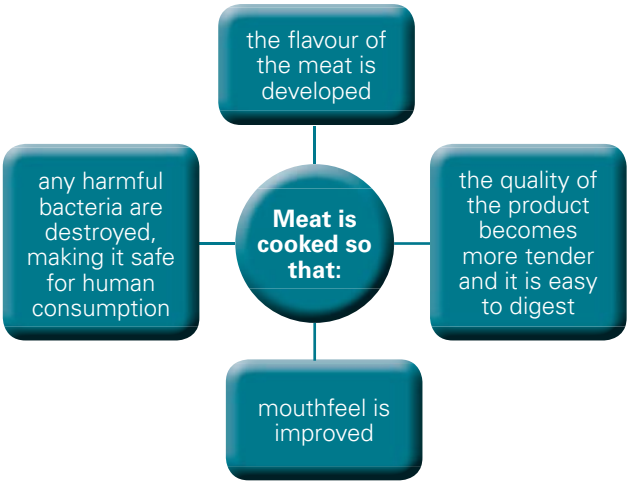


Figure 7.8 Reasons for cooking meat

Best quality: Check out the meat

When selecting or purchasing meat, there are a few simple tips to follow:

1. Check out the colour of the meat: dark-coloured meat indicates aged or mature meat.
2. Check out the colour of any bones that may be included in the cut of meat: pink bones indicate a young animal; white bones indicate a mature animal.
3. Check out the use-by dates on packaged meats; never purchase meat if it is past its use-by date! And never buy meat that smells or looks old.

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coagulation The changing of a protein from a liquid to a solid when heated or agitated.

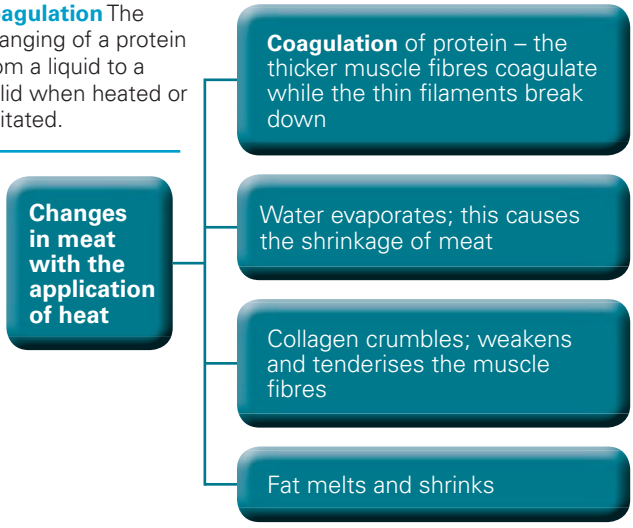

Figure 7.9 Changes in meat due to heat

Tasty Trivia

Goannas are one of the animals traditionally hunted by Aboriginal and Torres Strait Islander peoples. Goannas usually are cooked whole in their skins on the hot coals of a campfire. This makes the meat juicy and sweet.

moist heat Any cooking technique that involves cooking with moisture: steam, water, stock, wine or some other liquid. Generally, low temperatures are used.

dry heat Any cooking technique where the heat is transferred to the food without moisture. Dry heat cooking involves high temperatures.

hydrolysis A chemical reaction with water that causes decomposition of the muscle fibres.

Methods of cooking meat

Meat can be cooked by **moist heat** or **dry heat**.

Dry heat method

Dry heat methods are used to cook tender cuts of meat. These cuts of meat have small amounts of connective tissue, so cooking is not needed for **hydrolysis** of the collagen.

CREATE A SOLUTION

Traditional Aboriginal and Torres Strait Islander methods of cooking meat involved the roasting of meat on hot coals. This was the basic technique for cooking flesh, including most meats, fish and small turtles. In order to soften the meat, slow roasting was also used. This involved covering the meat with coals and ashes. After cooking, the meat would be consumed quickly.

For animals, such as kangaroo, the fur would first be singed off in the flames. As the carcass started to swell, it would be removed from the flames, gutted and the remains of the fur scraped off with a sharp implement. By this time the fire would be a bed of hot coals on which the carcass would be cooked further.

You have been given a tough piece of kangaroo to cook. Investigate the cooking and preparing of the kangaroo and explain how you would cook it in the school kitchen to meet the cultural requirements of the local Aboriginal and Torres Strait Islander community.

7.8 LET'S COLLABORATE

Each animal can provide us with tender and tough cuts of meat. Research and list two tender cuts and two tough cuts of meat, and state the method of cooking that should be used for each cut.

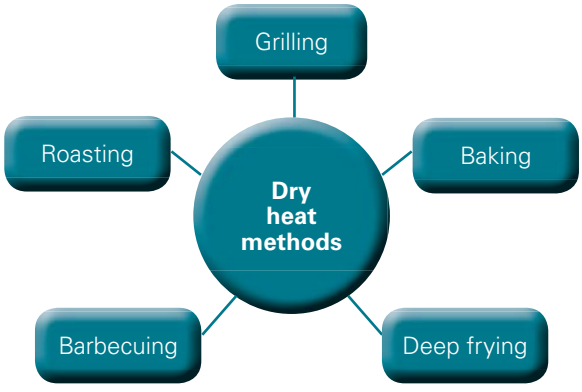

Figure 7.10 Dry methods for cooking meat

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7.9 ACTIVITY

Dry methods for cooking meat

Dry heat surrounds the meat and cooks it. This method of cooking does not involve any moisture, but uses high temperatures.

Look at the meat cuts chart in Figure 7.6 on p.174, then copy and complete the table below. Suggest two cuts of meat that would be used for each dry cooking method.

Dry heat cooking method	Cuts of meat
Baking	
Grilling	
Roasting	
Barbecuing	
Deep frying	

Cooking meat by moist heat

Moist heat cooking involves cooking meat with the use of moisture. The liquid or moisture used can include steam, water, stock or wine. Lower temperatures are used as opposed to dry heat cooking. Tougher cuts of meat are generally cooked by this method, as it softens the collagen of the meat. Seasoning, sauces and flour are added during cooking to enhance the flavour and texture of the final meat dish.

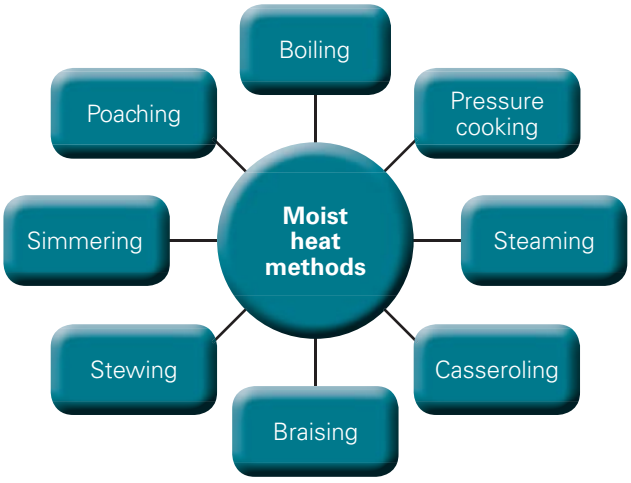

Figure 7.11 Moist methods for cooking meat

7.10 ACTIVITY

Moist methods for cooking meat

Investigate recipes to cook meat by moist heat.

1. Explain how this method of cooking is carried out.
2. Search a variety of recipe books (not on the internet this time) to find two recipes to cook meat using this method. Find one recipe for beef and one recipe for lamb.
3. For each of the recipes, do the following:
   - **a** Identify the cut of meat that is used for your moist heat cooking method.
   - **b** Explain the types of liquid used in heat transfer for this cooking method.
   - **c** List the seasonings or flavours used in this recipe.
   - **d** Discuss how long it takes to prepare this recipe.
   - **e** List the reasons why you think many people choose not to prepare meat using this method of cooking.

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Tasty Trivia Until the late nineteenth century, rural communities in North America would gather together to build giant tepees from wood. The tepee was covered with a mixture of mud and water. Once the covering had dried, a fire was set and an oven was created. Whole animals were cooked to feed the people of the community.

REFLECT ON LEARNING

1. Explain the nutritional value of meat. Explain why some meat can be high in fat.
2. Discuss the reasons why meat is cooked before we eat it.
3. Describe the changes that occur with the application of heat that make meat more pleasing to our tastebuds.
4. Outline why you should never buy meat that is past its use-by date.
5. Compare the different methods used to cook meat.

Tasty Trivia Each Australian eats on average 46.2 kg of chicken meat per year. About 50 years ago, Australians ate just 7 kg of chicken per person per year. This change came about because chicken meat became cheaper as the chicken industry became more efficient and increased productivity.

Check out poultry

Chicken, duck, turkey, pigeon, quail, goose and pheasant are all different types of poultry that are eaten. Chicken is the most commonly eaten poultry in Australia.

Poultry is cooked in order to ensure that micro-organisms are destroyed, to tenderise the meat and to develop flavour.

Undercooked chicken is a common cause of **salmonella** food poisoning, so it is important to ensure that all chicken is cooked properly.

salmonella A bacterium that causes food poisoning.

When chicken is cooked properly, the meat changes colour from pink to white, the flesh will feel soft and will break away easily if it is on a bone, and the juices will be clear rather than red or pink in colour.

7.11 INVESTIGATE IT

For everything chicken related, check out the Australian Chicken Meat Federation's website. Get on to the 'Chook Chat' and find out more about the chicken industry. Watch the Farm Visit video to find out what a typical Australian chicken farm is like. Click on to the 'Chicken Welfare Site' and watch the video *How Chicken Farmers Care for Their Birds*. Decide for yourself whether and how much chicken welfare matters.

Tasty Trivia Poultry is an excellent source of protein and B group vitamins – thiamin, riboflavin, niacin and minerals. The skin of poultry has a layer of fat just beneath the surface; if this is removed, the rest of the meat of a chicken is very low in fat.

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Figure 7.12 Which of these cuts do you prefer? Do you know how to prepare the different cuts to bring out the flavour?

7.12 LET'S COLLABORATE

Make a list of as many different cuts of chicken as you can think of. Compare your list with that of your partner and add to your own list.

7.13 ACTIVITY

Free range, organic: What's the difference?

Use the internet to find out the difference between free-range chickens, organic chickens and conventionally farmed chickens. Use the Australian Chicken Meat Federation website as a starting point. From your research, make a decision about which type of chicken meat you would prefer to eat. Discuss why you have reached this decision.

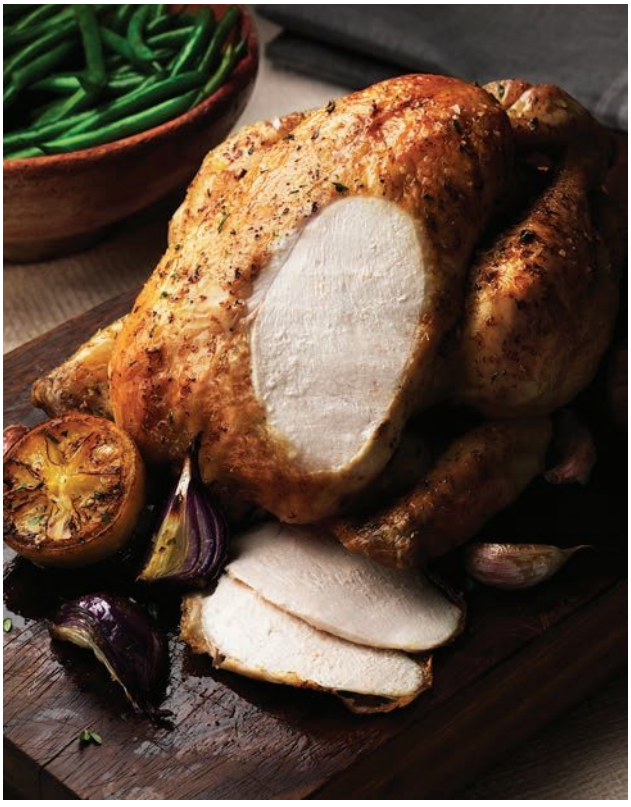

Figure 7.13 Always ensure chicken is cooked properly.

When storing poultry, it is important to remember that it is a **perishable** food product, and therefore needs to be well wrapped or covered and kept in the refrigerator or freezer. Any leftover poultry food products should also be well wrapped or covered, and refrigerated immediately. When you want to eat the leftovers, you must either eat them cold or heat them thoroughly.

perishable Subject to decay.

7.14 LET'S COLLABORATE

Discuss with a partner how you know when chicken is cooked.

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REFLECT ON LEARNING

1. Explain the structure of poultry.
2. Discuss the reasons why it is critical that chicken is cooked properly.
3. Compare the nutritional value of poultry and that of red meat.
4. Chicken is highly perishable. Explain what this means.
5. Provide a list of observations that you could make to see whether a chicken is cooked properly.

Ethical issue: Free-range and organic chicken

With a growing understanding and increased emphasis on the ethics of food, people want more choice about their food and how it is produced.

Chicken is no exception. While conventionally farmed chicken accounts for 95 per cent of chicken available in the marketplace, free-range and organic chicken products have become available and demand for chicken farmed in these ways is increasing.

Free-range chicken

As the name suggests, **free-range chickens** are allowed to roam freely outside during the day, but roost in sheds at night. The health issues of free-range birds are also managed differently. Sick birds are treated with antibiotics, but these birds are no longer able to be sold as free-range chickens.

free-range chickens Birds are allowed to roam freely outside during the day, but roost in sheds at night.

organic Food that is grown and/or produced without synthetic chemicals – for example, no weed killers or sprays to kill insects, moulds or fungus.

Certified organic chicken

Organic chicken meat complies with the same requirements as free-range chicken, as well as meeting two extra conditions. The chickens must be fed with predominantly certified organic ingredients and the birds are not able to be treated with vaccines.

The consumer demand for free-range and organic chicken is increasing and expected to continue to grow as consumers become more interested in the origins and production of their food products.

7.15 ACTIVITY

Free-range standards

Visit the Free Range Egg & Poultry Australia website and answer the following questions:

1. What is FREPA and what is it dedicated to doing?
2. List the free-range meat bird standards.
3. Explain why these standards have been set.
4. What is RangeCare and how does this approach impact chicken meat?
5. How can you be certain that you are buying free-range chicken meat?

Figure 7.14 The requirements for an Australian Certified Organic label. © Australian Organic Ltd, used with permission.

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Sticky chicken drumsticks with spicy sweet potato skins and avocado dip

RECIPE

Main tools and equipment

Oven, oven tray, bowl, fork, measuring spoons, garlic crusher, lemon juicer, scales

Production skills

Peeling, mixing, mashing

Cooking processes

Roasting, baking

SERVES 2

Preparation time: 60 minutes

Cooking time: 60 minutes

Serving and presentation time: 5 minutes

Total time: 125 minutes

Ingredients

 1 medium sweet potato, scrubbed	 2 tablespoons olive oil	 4 chicken drumsticks	 2 tablespoons maple syrup
 2 tablespoons low-salt soy sauce	 1 teaspoon sesame oil	 ½ ripe avocado, stoned and peeled	
 Juice of ½ lemon	 100 g cream cheese	 Salt and pepper	
 1 clove garlic, crushed	 ¼ teaspoon paprika	 ¼ teaspoon chilli flakes	

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Method

1. Preheat oven to 180°C.
2. Rub the sweet potato with half the olive oil, place on a non-stick pan and bake for 40–50 minutes or until flesh is soft.
3. Trim the chicken drumsticks of any excess skin.
4. Mix the maple syrup, soy sauce and sesame oil in a bowl. Add the chicken drumsticks and coat well.
5. Place the drumsticks onto a non-stick tray and roast in the oven for 30–40 minutes. Coat the drumsticks with the sauce once during the cooking time.
6. In a small bowl, mash the avocado and mix with the lemon juice, cream cheese, and salt and pepper.
7. Remove the sweet potato from the oven, cut in half lengthways and carefully scoop out the flesh, leaving at least 1 cm of the sweet potato on the skin.
8. Cut the skins into wedges.
9. Put the remaining olive oil in a bowl with the garlic, paprika, chilli flakes, salt and pepper. Mix until combined.
10. Toss the skins in the oil mixture and spread onto the non-stick tray. Bake in the oven until chicken drumsticks are cooked.
11. Serve the chicken drumsticks with the spicy sweet potato skins and avocado dip.

Check out fish

Flathead, prawns, scallops and mussels are some of the different types of seafood that we eat in Australia. Seafood is any sea animal or seaweed that is served as food or is suitable for eating. There are many classifications of seafood such as **aquatic** **vertebrates** and **shellfish**.

aquatic relating to water.

vertebrates Animals or fish with a backbone.

shellfish An invertebrate water animal that has a shell.

7.16 LET'S COLLABORATE

Make a list of vertebrates that we eat in Australia. Then make a list of shellfish that we eat in Australia. Compare your lists with those of a partner and add to each of your lists.

Figure 7.15 Seafood salads are healthy and taste good!

CREATE A SOLUTION

There are a number of different fish types available for purchase and for catching in Australian waters. You may have been lucky enough to have gone fishing and caught a rainbow trout. Research the rainbow trout to find out whether it is suitable for the Fish Fingers and Wedges recipe on p.186.

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Fish fingers and wedges

SCOTLAND

RECIPE

Main tools and equipment

Knife, measuring spoons, measuring cups, measuring jug, fork, chopping board, baking paper, baking tray

Production skills

Beating, cutting, crumbing

Cooking processes

Baking

SERVES 1

Preparation time: 30 minutes

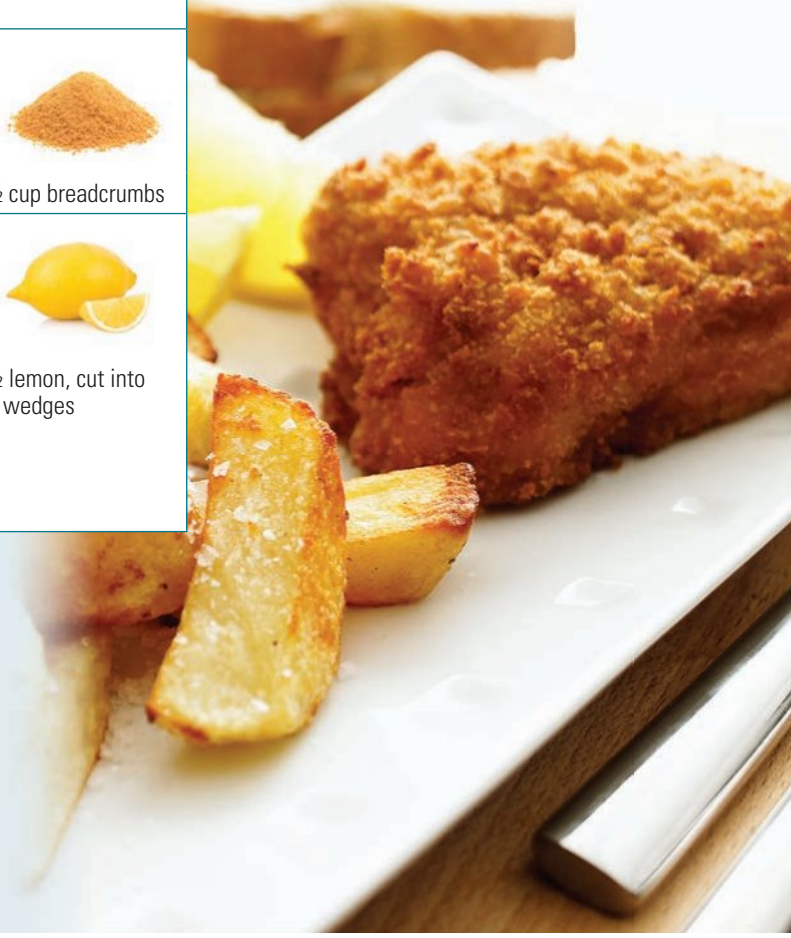
Cooking time: 35 minutes

Serving and presentation time: 5 minutes

Total time: 70 minutes

Ingredients

 2 medium potatoes, cut into wedges	 ½ tablespoon canola oil	 ¼ cup plain flour	 ¼ teaspoon pepper
 ¼ teaspoon salt	 ¼ cup milk	 1 egg, lightly beaten	½ cup breadcrumbs
 300 g white skinless fish (flathead, whiting, flake), cut crossways into 10 cm long × 2 cm wide pieces	 Cooking spray	 ¼ cup tartare sauce	½ lemon, cut into 2 wedges



Method

1. Preheat the oven to 220°C. Line 2 baking trays with baking paper.
2. Place potato wedges onto one of the baking trays. Use a pastry brush to brush wedges with oil. Bake in oven for 20 minutes.
3. Place flour, pepper and salt onto a large flat plate. Stir carefully to combine. Set aside.

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4 Combine milk and egg in a large bowl. Set aside.
5 Place breadcrumbs onto a large flat plate.
6 Set up a flour, milk and egg, and breadcrumb three-phase process.
7 Toss fish in the flour mixture, coat the fish in the milk and egg mixture and coat the fish in breadcrumbs. Repeat with all of the fish.
8 Place all crumbed fish onto the remaining oven tray. Spread out evenly. Spray with cooking spray.
9 Bake fish in oven for 10–15 minutes until golden. Turn once during cooking.
10 Serve with tartare sauce and lemon wedges.

7.17 LET'S COLLABORATE

Seaweeds are rarely considered seafood, even though they come from seawater. Can you think of any foods eaten in Australia that are made of or contain seaweed?

Fish is very similar in structure to meat, although it has very little connective tissue so cooking only needs to be very quick and gentle. If fish is overcooked, the protein shrinks and squeezes out moisture, leaving the flesh dry and rubbery.

In terms of nutrient content, fish is a good source of protein and minerals. Fish contains essential fatty acids called **omega-3 fatty acids**. Omega-3 fatty acids are heart-friendly and should be consumed as part of a well-balanced diet.

omega-3 fatty acids Long-chain polyunsaturated fats that have health benefits.

Tasty Trivia

Omega-3 fatty acids are said to be one of the major reasons for the reduced risk of cardiovascular diseases in Eskimos. The longer life expectancy of Japanese and Nordic populations is also said to be due to their higher consumption of fish and seafood.

Figure 7.16 Seaweed is eaten in large quantities in many cultures.

7.5 Cooking fish

Most fish, like other animal products, needs to be cooked in order to destroy micro-organisms, tenderise or soften it and develop its flavour. **Moderate temperatures** and a quick cooking time are required for fish. If fish is overcooked, it flakes, breaks up, shrinks and becomes dry. Moist cooking methods, such as poaching and steaming, and dry cooking methods, such as grilling, deep frying and baking, can be used to cook fish.

moderate temperatures 160 to 180°C.

7.18 LET'S COLLABORATE

Fish can be served raw. Can you think of some examples of ways in which raw fish is eaten?

Fish can also be preserved: it can be dried, smoked, frozen, salted, pickled and canned.

Figure 7.17 In many cultures, food is left to dry in the sun, like these cuttlefish.

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Seafood allergy is a type of food allergy where the sufferer is hypersensitive to shellfish, scaly fish or **crustaceans**. These seafoods cause an overreaction of the immune system, leading to severe physical symptoms. The most severe seafood allergy is called **anaphylaxis**.

crustacean A hard-shelled invertebrate animal.

anaphylaxis An extreme allergic reaction to a food product.

Storing fish

Fish should be stored at cold temperatures at all times. It is important to wrap fresh fish tightly, as the odour of fish can affect other food items in the refrigerator. It is also important to use fish within two days of purchase to ensure that it is of the best possible quality.

Selecting fish for optimal quality

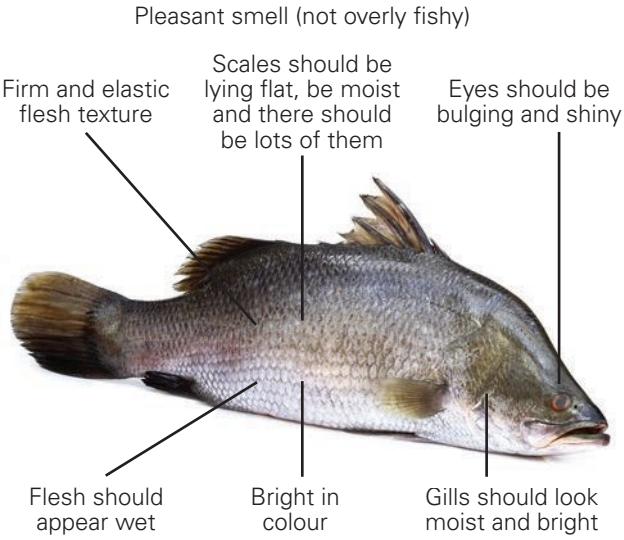

Figure 7.18 Selecting fish

DESIGN BRIEF: FISH FOR LUNCH

Create a lunch wrap that contains a preserved fish product. The wrap should be low in cost, quick and easy to prepare, and needs to take into consideration the foods suggested by the Healthy Eating Pyramid or the *Australian Dietary Guidelines*. Use your imagination to create your own solution to the design brief. Make two wraps – one for yourself and one for a friend, who will help you to carry out a sensory analysis.

Sustainable fishing

It is very important when growing, harvesting and catching food that we consider the environment and ensure that we are taking foods – particularly fish and seafoods – at sustainable rates. Sustainable fishing attempts to provide humans with food, fish oil, animal feed and any other fish or seafood products in a manner that is ecologically friendly, economically viable and equitable, and socially responsible to future generations. For more information about the status of Australian fish stocks, refer to the Fisheries Research and Development Corporation (FRDC) website.

Figure 7.19 A salmon farm in Tasmania

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Tuna bites with sweet chilli dipping sauce

Main tools and equipment

Knife, measuring spoon, measuring cup, fork, food processor or plastic bag and rolling pin, frying pan

Production skills

Chopping, mashing, shaping

Cooking processes

Frying

MAKES 10

Preparation time: 40 minutes

Cooking time: 15–20 minutes

Serving and presentation time: 5 minutes

Total time: 60–65 minutes

Ingredients

 100 g canned tuna in spring water, drained	 1 egg	 1 teaspoon continental parsley, finely chopped	Salt and pepper
 2 slices stale wholemeal bread	 ¼ cup plain flour	 2 tablespoons olive oil	¼ cup sweet chilli sauce, for serving

Method

1. Mash together the tuna, egg, parsley, salt and pepper.
2. Using a food processor or a plastic bag and rolling pin, process/crush the bread until it forms a fine crumb.
3. Add the breadcrumbs and a small amount of flour at one time in order to bind the mixture together.
4. Divide the mixture into 10 even portions and shape each portion into a ball. Flatten each ball.
5. Refrigerate for 10 minutes.
6. Place olive oil into a frying pan and heat lightly. Space the balls out evenly in the pan and fry until golden and crisp.
7. Remove from frying pan and drain on kitchen paper.
8. Serve with sweet chilli sauce.

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Tasty Trivia

Sharks: An ethical issue

One of the most threatened groups of fish in Australia is sharks because they are so slow to breed and they are not keeping up with the numbers being caught. In Australia, sharks are the main fish used in fish and chips – better known as flake. To help with the preservation of sharks, next time you ask for fish and chips, perhaps try a different fish. You might enjoy barramundi, whiting, flathead, bream, mullet or snapper. These species are not as overfished as sharks and are a more sustainable choice.

Figure 7.20 High-quality seafood makes for a delicious meal.

7.19 ACTIVITY

Develop two report cards: one for fish and another for shellfish. Research and digitally create an information card to include the following information:

1. definition
2. origin
3. visual examples of different types of both fish and shellfish. Include those that are farmed, hunted and wild.
4. physical properties
5. sensory properties
6. chemical properties.

REFLECT ON LEARNING

1. Suggest three differences in the two classifications of seafood listed on p.185.
2. Explain why it is important not to overcook fish.
3. Compare the nutritional value of fish and red meat.
4. Explain the health implications for a person who has a seafood allergy. In your response, discuss how this can result in anaphylaxis.
5. Finish this sentence: 'For fish to be of the highest quality when it is eaten, it is important to …'

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LOOKING BACK

1 Meat is the edible part of the flesh or muscles of animals. Many different animal products are eaten in Australia. The five main classes of animals bred for human consumption in Australia are cattle, sheep, pigs, chicken and fish.

2 Meat is made up of tiny muscle fibres, which are held together by connective tissue.

3 The nutritional value of meat depends on the type of animal and the part that is eaten. The muscle tissue of meat contains protein, essential amino acids, iron and B group vitamins. Some cuts of meat are also high in saturated fats.

4 Meat can be cooked using a variety of different methods. The dry heat method of cooking is best for tender cuts of meat, and the moist method of cooking is used for tougher cuts of meat.

5 Chicken is the most commonly eaten poultry in Australia. Seafood is also a popular animal food eaten in Australia. Both chicken and seafood have a similar structure to red meat and vary in their nutritional content.

TEST YOUR KNOWLEDGE

Multiple choice

1 Wet methods of cooking used for tough cuts of meat include:

- **a** baking, grilling and roasting
- **b** chopping, dicing and slicing
- **c** boiling, poaching and simmering
- **d** roasting, barbecuing and smoking.

2 When storing poultry, which is a highly perishable food, it should be placed:

- **a** in an airtight container in the cupboard
- **b** on the kitchen bench in the sun to be thawed
- **c** in the fridge, well wrapped
- **d** in the fridge on the top shelf.

True/false

1 The carcasses of animals are cut into the different meat cuts as soon as they are slaughtered.

2 Dry and cold methods of cooking are used to cook different cuts of meat.

3 Seaweed is a type of seafood.

Short answer

1 Meat is the edible part of the flesh and muscles of an animal. List three different types of meats eaten in Australia and suggest a recipe for each.

2 Explain what happens to meat when it is cooked.

3 Describe the nutritional value of meat.

Extended response

Visit the supermarket and complete a table like the one below to make a list of the preserved fish items that are available, and then respond to the questions that follow. You may need to do additional research using the internet to answer these questions.

Method of preservation	Type of fish	Added ingredients	Price

1 List three methods of preservation that are used to preserve fish.

2 Explain how fish is prepared using these types of preservation.

3 Discuss the reasons why preserved fish products require the addition of other ingredients.

4 Compare the keeping time of the preserved fish products with that of fresh fish.

5 Explain how fresh fish should be stored. Contrast this with preserved fish products.

6 Explain why you think there is such a price difference between preserved and fresh fish.

7 Detail the type of preparation and level of cooking skill that is required for frozen fish products. Compare this with a whole fresh fish.

8 Make a list of the ways in which canned fish can be used.

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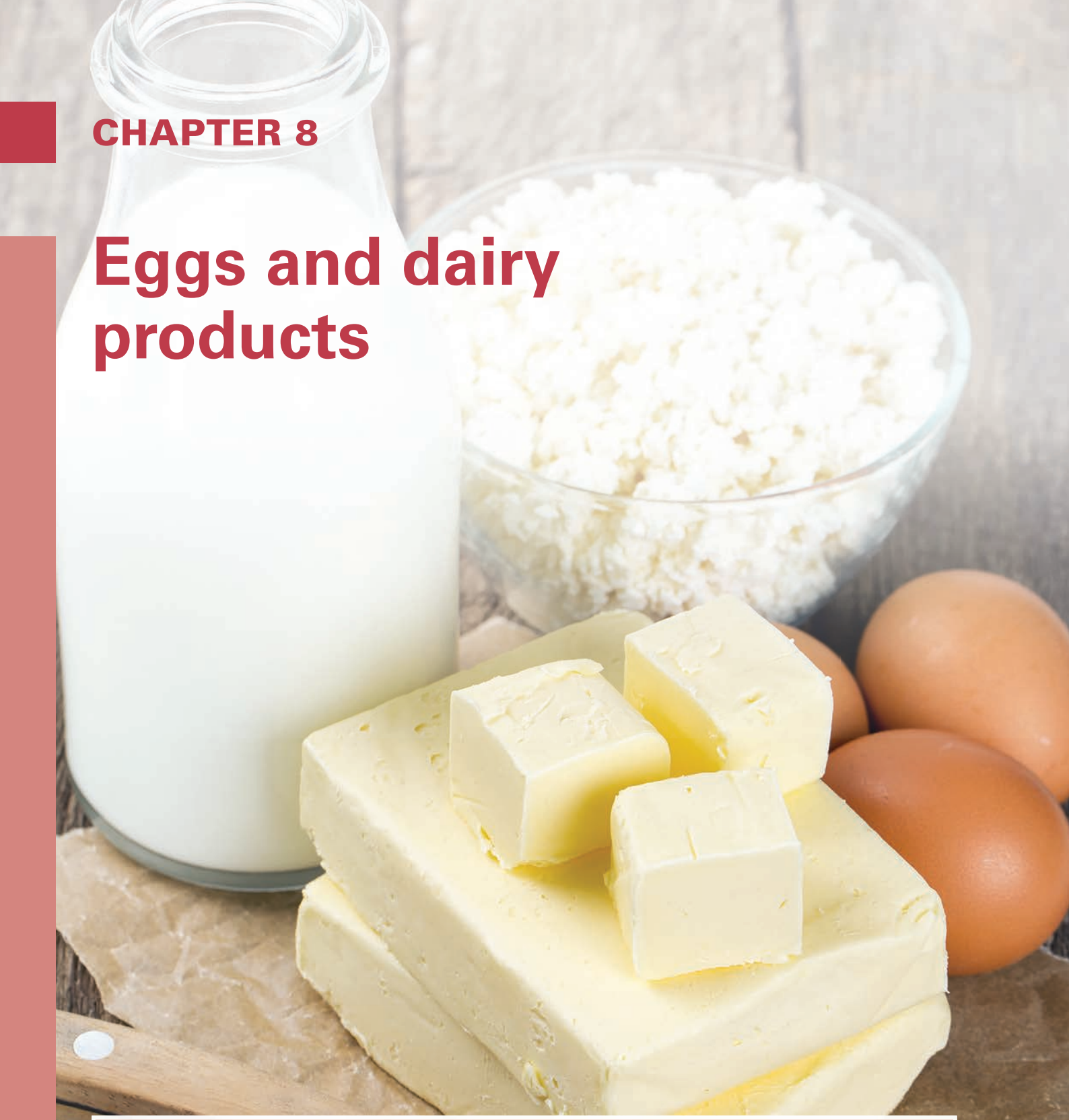
CHAPTER 8

Eggs and dairy products



ACCESS PRIOR KNOWLEDGE

1. Explain the difference between cage eggs, barn eggs, free-range eggs and organic eggs.
2. Name the different types of dairy milk consumed around the world.
3. Describe how you can tell whether an egg is fresh without breaking it.
4. Everybody can boil an egg, can't they? Suggest the best way to boil an egg.
5. Outline why it is important to include dairy foods in your everyday diet.

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8.1 Eggs: The basics

Eggs are one of the most versatile ingredients you can use in cooking. They are economical, and they come with their own fragile packaging and with different parts that can be used for different purposes, or you can use the whole lot together. They can be served very simply as boiled eggs, or as one of most admired and honoured dishes in cooking – a soufflé.

Tasty Trivia Some people believe that eating eggs could help treat acne, due to lowering the glycaemic load of the diet.

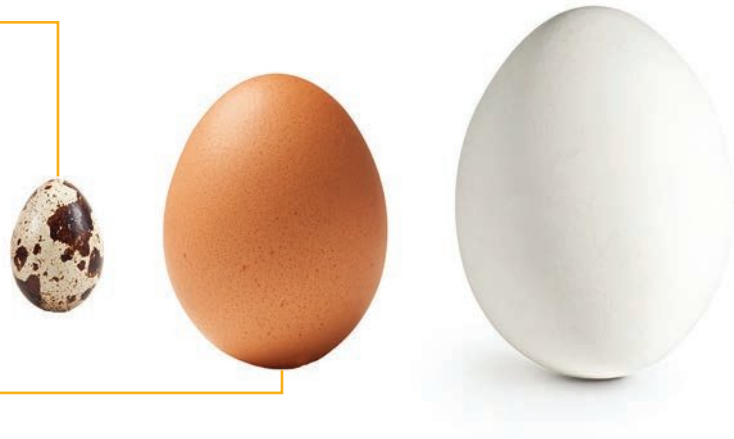
Figure 8.1 The versatile egg helps you produce many dishes, from a simple boiled egg to an elegant chocolate soufflé.

8.1 LET'S COLLABORATE

Have you ever tried an egg other than a hen's egg? If you have, describe what you ate, how it was served and how it tasted. If not, brainstorm when you might eat a different kind of egg, how it might be served and how it might taste.

Quail eggs are tiny compared with duck eggs. Often used in fine dining for their delicate appearance.

Hen eggs are the most commonly available and most frequently used egg. These eggs are usually sold in supermarkets.



Duck eggs are slightly larger than hen eggs. These can be substituted for hen eggs and are great for baking. Remember that these are bigger, so use one duck egg for every two hen eggs.

Figure 8.2 The eggs most commonly used in cooking.

8.2 LET'S COLLABORATE

Explain what the size of an egg represents. Suggest different uses for the different-sized eggs. Do you know which is the standard-sized egg used in cooking? Compare your answer with those of others in the class.

All hen eggs are classified according to size. In the supermarket, 50 g is the most common smallest size and 75 g is the largest. If a very small egg is needed, particularly as the feature of a special dish, **bantam** or **quail** eggs can be used.

bantam A breed of chicken that is small and produces much smaller eggs.

quail Small, plump, wild bird in the pheasant family; popular for roasting.

Tasty Trivia Some people think brown and white eggs are different; however, they are nutritionally and structurally the same.

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CREATE A SOLUTION

Your next-door neighbour is going on holiday and has brought you the contents of her fridge. One of the food items is a dozen eggs that are very close to their best-before date. Generate recipe ideas that use eggs and design a healthy breakfast, lunch or dinner solution to prevent the eggs being wasted. For a totally sustainable approach, come up with a way to utilise the egg shells as well, ensuring there is no landfill waste.

History of eggs

Originally, the source of eggs was non-domesticated birds. Since the beginning of civilisation, eggs have been enjoyed as a food and a special symbol in festivities. Eggs are often a symbol of birth and fertility, such as an Easter egg.

Eggs were the protein that was affordable to even the poorest people in early times, but equally enjoyed by the rich. In Roman recipe books, eggs were a recognised part of lunch. The advantages of eggs were that they were available all year round and storage was not a problem.

An ancient Chinese delicacy, 100-year-old eggs, continues to be famous today. They are not really 100 years old; they just look old. They are raw duck eggs preserved in salt, lime and pine ash for 100 days. When they are ready to be eaten, they are firm, like a boiled egg, but a translucent blue and green colour. They have a strong flavour with a slightly fishy taste.

Figure 8.4 A 100-year-old egg that is really only 100 days old

Figure 8.3 The original Easter egg was a coloured and decorated hard-boiled egg, given as a gift at Easter time. The giving of coloured, decorated real eggs continues to be a tradition at Greek Easter – this egg is decorated with a classical powder blue and gold motif.

Figure 8.5 Eggs come in many shapes. These are the world's most expensive eggs: caviar, or fish eggs.

Tasty Trivia

An eggshell can contain as many as 17 000 tiny pores on its surface.

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8.2 Structure of eggs

Have you ever thought of the structure of the egg representing the four elements of the Earth? Ancient philosophers believed the shell represented earth, the air was the air under the shell at the round end of the yolk, the yolk was fire and the white was water.

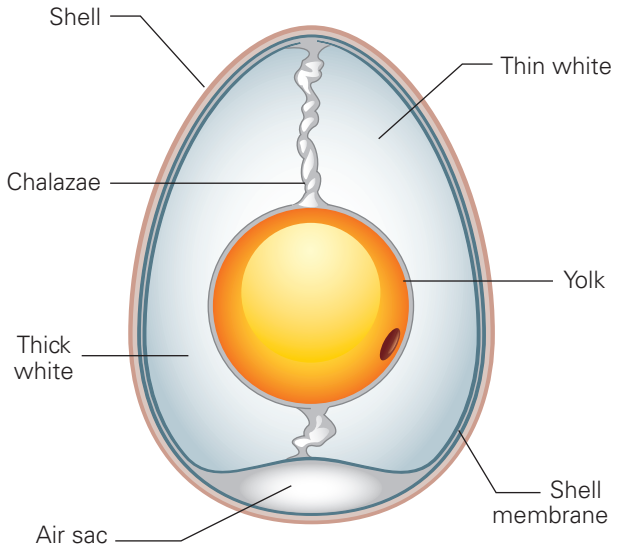

Figure 8.6 Structure of an egg.

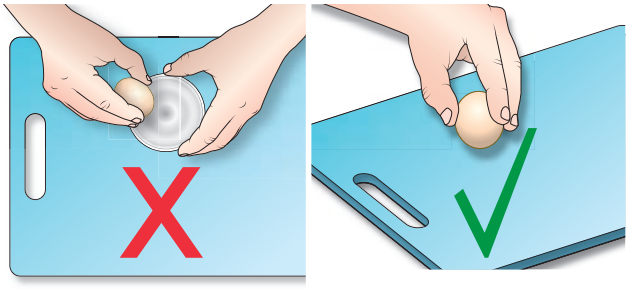

Figure 8.7 How to crack an egg correctly. A sharp edge may drive shell fragments and germs deep into the egg.

8.3 ACTIVITY

Which egg eggsactly (exactly)?

Oh no! Someone has mixed up your hard-boiled egg with your fresh eggs in the fridge. How can you tell the difference between a cooked egg and a raw egg?

1. Design an experiment to determine how you can tell which egg is raw and which egg is cooked. No eggs can be cracked or broken; they must remain fully intact.
2. Conduct your experiment. You will need one raw and one boiled egg.
3. Have you been able to determine which egg is which?
4. Can you explain this using your egg structure knowledge?
5. Discuss your findings as a class and decide the best way to identify your eggs.

Tasty Trivia

If you have leftover raw egg whites, you can freeze them to use later. Egg yolks are harder to freeze due to the gelatinous nature of the yolk, which makes them thicken when frozen.

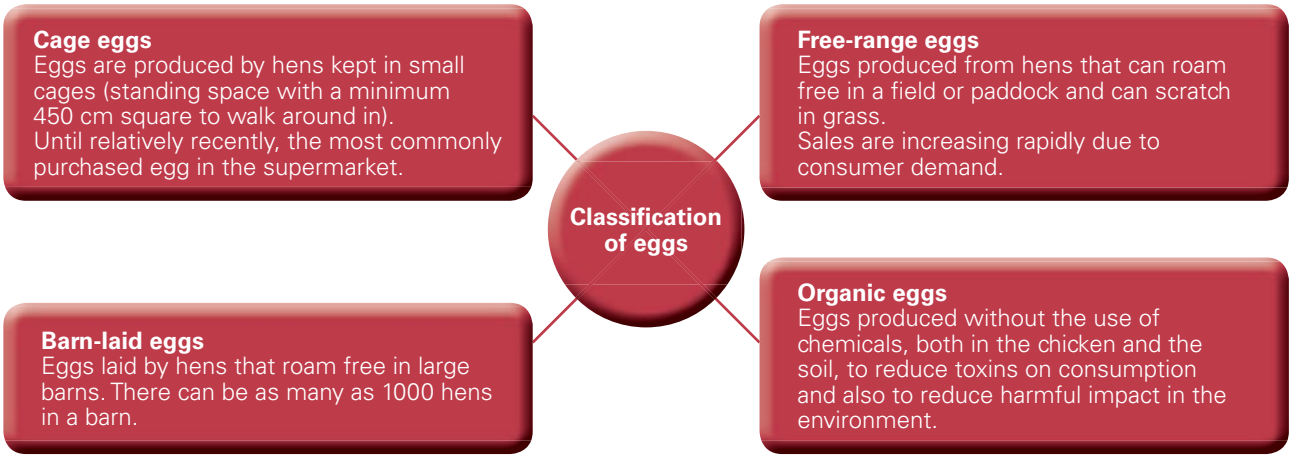

Figure 8.8 There are a number of different systems or methods used to produce eggs.

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8.4 ACTIVITY

Ethical eggs

For many, egg production is an issue of **ethics**. Complete a research investigation to understand more about the issue of caged eggs.

ethics The science of how we should live to attempt to live. Behaviours and decisions that reflect right or wrong.

1. Identify the range of eggs available for consumers to purchase.
2. Woolworths has made a commitment to remove battery hen eggs from its shelves by 2018. Explain why the company has made this decision.
3. Describe the impacts of this decision for:
   - **a** consumers
   - **b** Woolworths
   - **c** egg producers.
4. There are other ethical production issues being addressed by supermarkets. State what two of these might be.
5. Woolworths isn't the only supermarket making changes to food products sold. Suggest why other supermarkets are also making these changes.
6. Research the conditions of a caged hen. Describe these conditions.
7. Explain how this information makes you feel.
8. Discuss why eggs from caged hens are an ethical food issue.

8.5 INVESTIGATE IT

Josh's Rainbow Eggs

Visit the Josh's Rainbow Eggs website to discover more about this young farmer who was inspired to produce his own ethical eggs. You may have seen these eggs in the supermarket, or even found them in your fridge at home!

Use the information on the website to answer the following questions.

1. State where in Australia Josh's eggs are produced.
2. How old was Josh when he started selling eggs?
3. Describe how Josh's hens are raised.
4. Outline the five behaviours Josh believes make a chicken happy.
5. Define the term 'forage'.
6. Provide the justification for Josh's decision to call his eggs 'ethical eggs'.
7. Do you agree with Josh and his egg philosophy? Explain your response.

Figure 8.9 Which eggs are in your fridge at home?

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Quality considerations

Eggs are often in their own package that you cannot see through, so it can be difficult to tell whether they are fresh or stale. It is a good idea to open the package gently to see whether any of the eggs are damaged before you buy them.

8.6 ACTIVITY

Testing eggs

When you are at home, the easiest test for selecting good eggs is to place them in a clear bowl or jug.

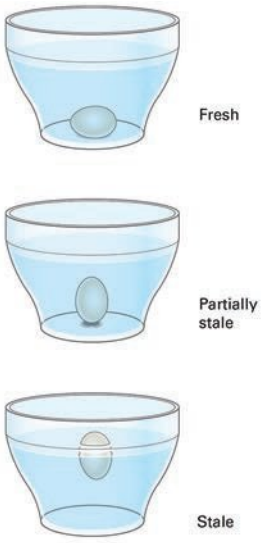

Figure 8.10 How to test the freshness of eggs.

1. Identify the part of the structure of the egg that has changed to create this difference.
2. The shell of the egg is hard. Explain the structure of the shell that allows air to pass through.
3. Safely store a raw egg for one month and then retest the egg. Describe the differences between each test. (You may like to use a diagram with annotations.)

Eggs are best stored in the fridge in their egg carton. Cartons are designed to sit the egg with the point facing downwards, keeping the yolk in the centre of the egg. But remember, when cooking with eggs, use them at room temperature for the best results.

8.3 Nutritional value of eggs: Chemical properties

Eggs, along with milk, are almost the perfect food; indeed, they are both often referred to as 'super foods' because they contain many nutrients in one complete package. The only nutrient not in either of these foods is dietary fibre. Eggs have all the nutrients necessary for a chick to develop – in particular, high protein content.

The nutritional content of the yolk and that of the white are slightly different, and this means they can be used differently in cooking and that they cook at a different rate.

Tasty Trivia Eggs have the highest nutritional quality protein of all food sources.

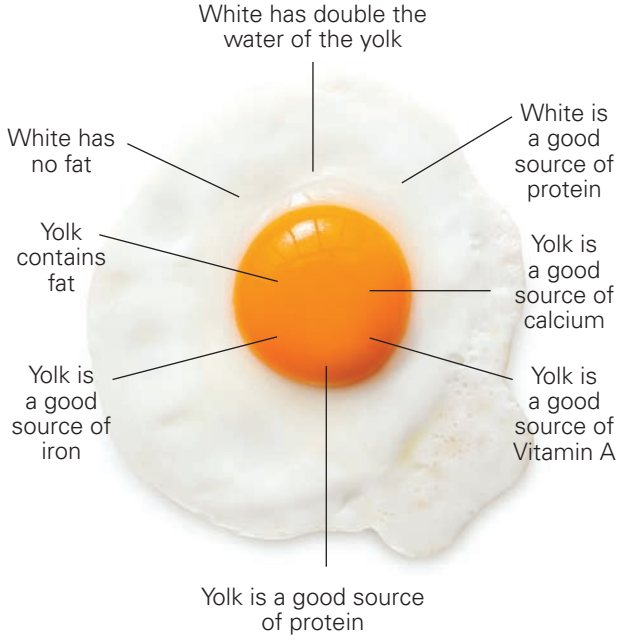

Figure 8.11 Nutrient differences in the white and the yolk of eggs.

8.7 ACTIVITY

White vs yolk

Complete a Venn diagram to compare the nutrient differences between the white and the yolk of eggs. Try and think of all the differences and similarities, such as chemical, physical, sensory and functional.

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REFLECT ON LEARNING

1. List four different types of eggs available for human consumption.
2. State two nutrient (chemical) property differences between the white and yolk of an egg.
3. Describe how to test whether your egg is old without breaking the shell.
4. Outline two physical (colour, shape or size) property differences between the white and yolk of an egg.
5. Explain the differences between the different classifications of eggs.

8.4 Cooking with eggs

During the cooking process, eggs change significantly because of their high protein content. As shown in Figure 8.11 on p.197, the yolk and white have a slightly different nutrient content, which influences how they cook. This is most noticeable when you fry an egg; the white sets before the yolk does.

The white has a higher protein content, so cooks at a lower temperature (about 65°C), cooks more quickly and will toughen very quickly when overcooked. The yolk contains fat and iron, so sets at a slightly higher temperature (about 70°C). Note that this is well below boiling point.

The protein content makes eggs useful in cooking, but it also means it is necessary to understand what changes occur because the protein in eggs can trap air and also sets when heated. This means they can be used for lots of different purposes in cooking.

Tasty Trivia

The greatest height from which an egg has been dropped and remained intact is 213 m. This was from a helicopter onto a golf course, where the egg landed in a perpendicular position on a steep slope.

Figure 8.12 In the soft-boiled egg (top), the white has set and the yolk is still runny. In the hard-boiled egg (bottom), both the white and the yolk have set.

8.8 LET'S COLLABORATE

List the many different ways eggs can be cooked, both in their raw form and also mixed with other ingredients. See whether you can generate a list of 10 or more methods.

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Chocolate soufflé

FRANCE

RECIPE

Main tools and equipment

Measuring spoons, measuring cup, ramekins, electric beater, metal spoon, medium bowl, pastry brush

Production skills

Melting, beating, greasing

Cooking processes

Baking

SERVES 2

Production time: 20 minutes

Cooking time: 15–20 minutes

Serving and presentation time: 3 minutes

Total time: 38–43 minutes

Ingredients

 Butter for greasing	 2 teaspoons caster sugar, extra	 30 g butter	 50 g cooking chocolate	 1 egg, separated
 Pinch salt	 2 tablespoons caster sugar	 1 tablespoon plain flour	Icing sugar for dusting	

Method

1. Prepare two ramekins by brushing the butter across the inside bottom of each ramekin and up the sides. Sprinkle each ramekin with the extra caster sugar. Tip out any excess sugar.
2. Preheat oven to 180°C. Place a baking tray into the oven to warm up.
3. Melt the butter and chocolate in the microwave. This should only take a minute.
4. Beat the egg white and pinch of salt until soft peaks form. Sprinkle over the caster sugar and continue beating until firm peaks form.
5. Stir egg yolk and flour into chocolate mixture. Mix well to combine.

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Chocolate soufflé – continued

6 Fold the egg white into the mixture until just combined. Try to be as gentle as possible so the white holds its air bubbles.

7 Divide the mixture between the two ramekins.

8 Take the baking tray out of the oven and put it onto the stove top. Place ramekins onto the warm tray and then bake for 15–20 minutes or until risen.

9 Dust with icing sugar to serve.

Evaluating

1 Describe how to prepare the ramekin for your soufflé.

2 Suggest why it is important to ensure you have prepared this correctly.

3 Explain the increase in egg white volume.

4 Describe what would happen if you mixed your soufflé rather than folded your mixture.

5 Describe the sensory properties of your soufflé.

6 Name three other ingredients you could add or substitute in this recipe.

7 Identify the process that is responsible for thickening your roux.

8 Describe how you could serve this product to make it a healthy evening meal.

9 Identify the most challenging component of this recipe. Discuss your success in this area and suggest possible reasons for this.

Uses of eggs in cooking

- Eggs set or coagulate when heated, so are good for omelettes and quiches.

- Eggs in liquid thicken when heated, which is good for sauces and custards.

- Egg white traps air when beaten and sets when heated, holding the shape; it is therefore good for sponge cakes, meringues and soufflés.

- Eggs hold ingredients together, which is good for hamburgers.

- Eggs coat foods so breadcrumbs will stick, which is good for crumbed fried fish.

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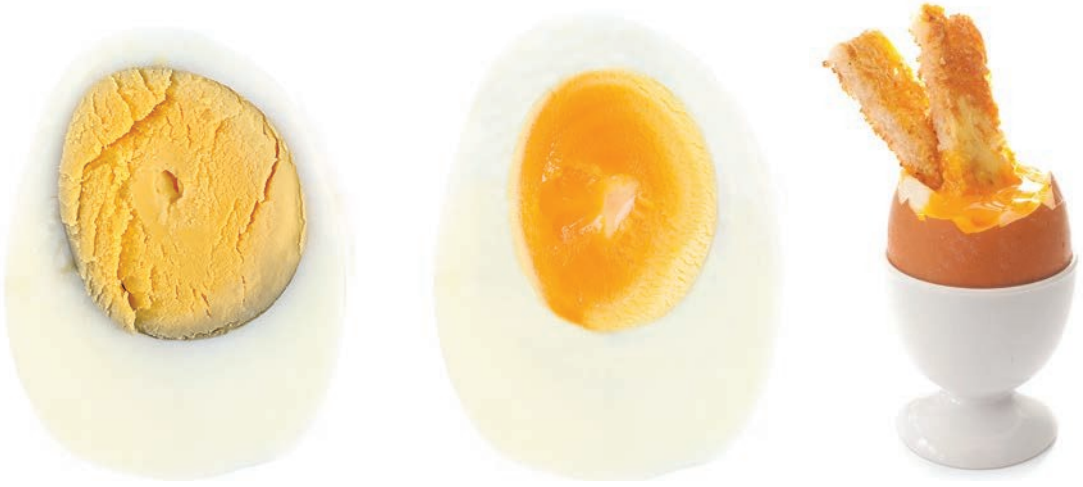
8.9 ACTIVITY

What is the best way to boil an egg?

Work in a group of four. Each person has a 50 g egg. Each person takes a number between 1 and 4, and boils their egg according to the instruction for their number in the table below. The eggs can be used as a garnish for the Nasi Goreng dish on p.203 or as part of a salad. If a thermometer is available for each group, it will help to ensure more reliable results. When the eggs are completely cool, remove their shells and cut them in half lengthwise. Share your results with your group members. Make the following observations and record your results:

1. State which egg/s are easiest to shell.
2. A common sight in hard-boiled eggs is a greenish-black ring around the yolk. This is an iron sulphide build-up caused by the iron in the yolk reacting with sulphur in the white. The egg can still be eaten, but it affects the appearance of the eggs. Identify the eggs that have this ring.
3. Identify the eggs with the tougher white and the drier yolk. You may wish to taste a tiny bit to check the **mouthfeel**.
4. From your observations, suggest which is the best way to cook a hard-boiled egg. Use your observations to support your answer.

mouthfeel How food or drink feels in the mouth – the sensory evaluation of impressions on the palate.



Cooking instructions for a hard-boiled egg	Instructions once cooked	Cooling instructions
Person 1: Place the egg in cold water and bring to the boil and reduce heat to a very gentle simmer for seven minutes.	Crack the shell gently when cooked.	Cool in cold water.
Person 2: Place the egg in cold water and bring to the boil and reduce heat to a very gentle simmer for seven minutes.	Do not crack the shell when cooked.	Leave in the air to cool.
Person 3: Place the egg in cold water and bring to the boil and boil rapidly for seven minutes.	Crack the shell gently when cooked.	Cool in cold water.
Person 4: Place the egg in cold water and bring to the boil and boil rapidly for seven minutes.	Do not crack the shell when cooked.	Leave in the air to cool.

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8.9 ACTIVITY continued

5 Evaluate the effectiveness of your group in completing this task. In your books, complete the sentence for each of the following:

- **a** Our group produced … work. (Comment on the quality.)
- **b** All members of our group contributed … (Comment on how well all members of the group contributed.)
- **c** Our group managed the time for the task … (Comment on how well your group managed the time.)
- **d** Our group focused on the task … (Comment on how well your group remained focused on the task.)
- **e** Our group worked … together. (Comment on how well the group worked together.)

Egg is often used as a garnish for Nasi Goreng, a traditional Indonesian rice dish. The egg can be fried, boiled or a sliced omelette. (You could use the plain omelette recipe later in the chapter.) The egg is placed on top of the rice, where it is not only a garnish but it also adds nutrients to the dish and is an ideal quick, economical, vegetarian lunch.

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Nasi Goreng

INDONESIA

Main tools and equipment

Wok or large frying pan, measuring spoons, measuring cup, wooden spoon, chef's knife, chopping board.

Production skills

Measuring, slicing

Cooking processes

Stir-frying

SERVES 2

Preparation time: 10 minutes

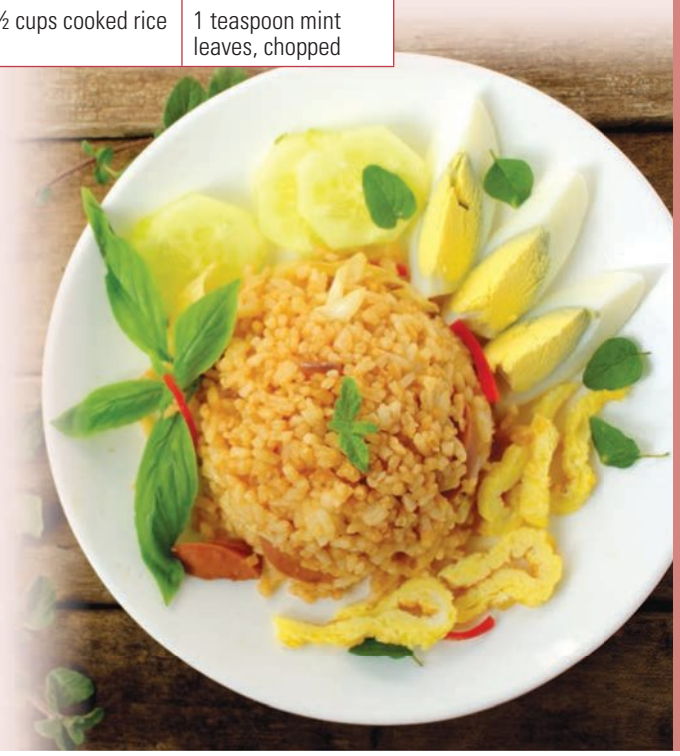
Cooking time: 10 minutes

Serving and presentation time: 7 minutes

Total time: 27 minutes

Ingredients

 1 tablespoon peanut oil	 2 spring onions, finely sliced	 1 clove garlic, finely chopped	 1 tablespoon tomato sauce	 1 tablespoon soy sauce	 ½ teaspoon sambal oelek or chilli sauce
 ¼ cup frozen peas	 5 cherry tomatoes, cut in half	 ½ cup bean sprouts	 1½ cups cooked rice	 1 teaspoon mint leaves, chopped	
 1 teaspoon parsley or coriander leaves, chopped	 4 iceberg lettuce leaves, shredded	 2 hard-boiled eggs, sliced			



Method

1. Heat the oil in a wok or large frying pan over a medium heat.
2. When hot, add the spring onions and garlic, and fry for 30 seconds.
3. Reduce the heat to medium, then add the tomato sauce, soy sauce and sambal oelek (or chilli sauce), peas, tomatoes and bean sprouts.

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Nasi Goreng – continued

RECIPE

4 Stir-fry gently for 2 minutes or until the peas soften slightly. Do not overcook the tomatoes.

5 With your hands, scatter the rice over the top, breaking up any clumps.

6 Stir-fry until hot and well combined. Add the fresh herbs.

7 Serve with the shredded lettuce to the side and the boiled eggs as a garnish.

Evaluating

1 Describe two properties that egg adds to this dish. Refer back to p.40 to review what 'properties' means.

2 Justify whether Nasi Goreng is suitable for a quick vegetarian lunch.

3 Suggest an additional ingredient for non-vegetarians. Remember the other requirements for the lunch.

4 List two additional vegetables that could be included. Describe the properties that each vegetable will add to the dish. How could you make an omelette to feed a family of four from one egg? With an ostrich egg – it is eight to 10 times larger than a chicken egg.

Tasty Trivia

An ostrich egg is the equivalent of about 24 chicken eggs. An emu egg is about half that size.

DESIGN BRIEF: OMELETTES

An omelette is a quick, tasty meal that is a traditional dish in many countries. Omelettes can be savoury or sweet. The main ingredient is beaten egg, which is quickly and lightly fried. It can be eaten for breakfast, a light lunch or as a starter for a meal or a snack.

Each country has a slight variation, usually with regard to the filling, but omelettes can also vary in the way they are cooked. For example, a plain omelette is folded and a Spanish omelette is flat. A Swiss omelette is a variation that uses cheese.

You are planning to have an omelette for lunch, as it is economical, but you want a variation as you are having friends join you. You want the omelette to be filling and tasty.

The following websites – Australian Eggs, Farm Pride and Pace Farm – have recipe sections that you can use to investigate different types of omelettes or frittatas to help you get started with your omelette design.

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8.10 ACTIVITY

Design your own omelette

Investigating

1 Prepare three criteria for success using the information in the design brief.

2 A plain omelette is one of the fastest meals you can cook **from scratch.** Omelettes cook quickly, so any filling must also cook quickly. Suggest three different fillings for an omelette for breakfast or lunch.

3 Different fillings suit different occasions. Generate three ideas for fillings suitable for a lunch omelette.

4 Investigate the other main ingredient in a Spanish omelette.

5 Frittatas are like Spanish omelettes. List three different flavouring ideas for frittatas.

from scratch Prepared from fresh ingredients, without the use of anything pre-cooked or packaged.

Generating

Design your own omelette. Draw an egg like the one illustrated below. Write your idea, suggest what the ingredients could be, justify your choice and include possible issues. For example, if you select tomato, it would need to be firm or the omelette will be watery.

Planning and managing

Create a production plan as a flow diagram for your omelette production.

Create a design sketch to show how you will present your omelette.

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Plain omelette

RECIPE

Main tools and equipment

Fork, measuring spoons, frying pan

Production skills

Measuring, beating

Cooking processes

Frying

SERVES 1

Preparation time: 3 minutes

Cooking time: 3 minutes

Total time: 6 minutes

Ingredients

 2 eggs	 1 tablespoon milk	 Salt and pepper	 1 teaspoon butter	 Small sprig parsley (garnish)

Method

1. Lightly beat the egg and milk, add the salt and pepper.
2. Melt the butter in an omelette pan or small non-stick frying pan over a moderate heat.
3. Pour the egg mixture into the pan and gently stir, moving the cooked mixture away from the edge of the pan and allowing the raw mixture to flow to the edge while rolling the pan. Only do this 3 or 4 times.
4. Allow the mixture to set. If flavourings are being used, these can be placed on one half of the omelette. Fold the omelette over in half.
5. Slide the omelette onto a plate. Garnish with parsley and serve immediately.
6. The omelette can be flavoured with 2 tablespoons of tasty cheese, 2 slices of chopped ham or 1 tablespoon of fresh herbs such as parsley, basil and/or thyme. A traditional Japanese-style omelette includes fried rice, like Nasi Goreng, as filling and chicken and seafood can be added. It is often served with tomato sauce over the top.

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Evaluating

1 Evaluate your omelette by answering your criteria for success questions.

2 Reflect on your project-management skills. Complete a self-assessment of work in the investigation and production of the omelette by copying and completing the traffic lights graphic organiser shown in Figure 8.13.

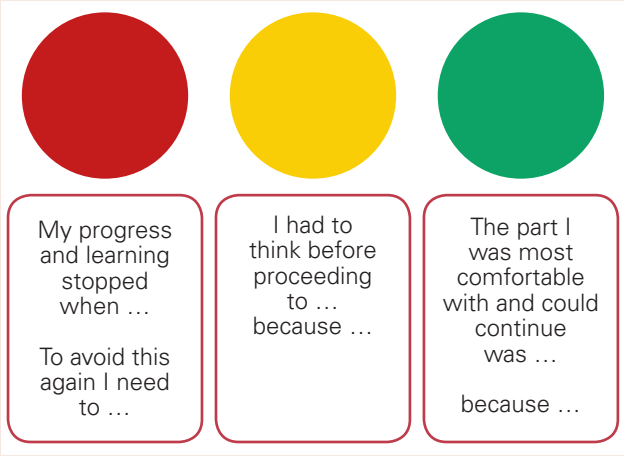

Figure 8.13 How well did this investigation go?

REFLECT ON LEARNING

1 Discuss the reasons why there is a difference in the cooking time of the egg white compared with the egg yolk.

2 Describe the best way to boil an egg.

3 An egg is often called a 'super food'. Explain why.

4 Describe two uses of eggs in cooking and give an example of a food for each use.

5 Eggs are a perishable food item. Define this term and explain the best way to store perishable items.

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8.5 Milk: The basics

micro-organism A tiny single-celled organism that is only visible under a microscope. Three types connected with food are yeast, moulds and bacteria.

pasteurisation A process in which milk is heated to a temperature just below boiling point and held at that temperature to kill micro-organisms. The milk is not boiled as this would also destroy nutrients.

Milk is the one food newborn mammals need to live and thrive for the first few months of their lives. It is white in colour and is the secretion from the mammary glands of all mammals after a baby is born. In Australia, cows are the main source of commercial milk, with goats also supplying milk to a lesser extent. Milk contains many naturally occurring **micro-organisms**, so in Australia all milk must undergo heat treatment, called **pasteurisation**, before it is sold. This destroys any micro-organisms, but retains the nutrients.

In other countries, a range of animals such as buffalo, camels, mares, reindeer, ewes and yaks are a source of milk. Milk can be made into an extensive range of products that have all become a part of daily eating patterns. These are **butter**, cheese and yoghurt.

butter A dairy product that is produced by churning milk or cream until the fat solidifies and forms a spread.

Figure 8.14 The purpose of milk is to feed a newborn mammal.

Tasty Trivia

In Kazakhstan, the popular milk drink, called *koumiss*, is fermented horse milk. Refrigeration is not available and the local Kazakhs are used to the taste and love it, but to most Western tastes it is really unpleasant.

Soy milk | Rice milk | Almond milk

Figure 8.15 These products are called 'milk', but they are not really milk according to the official Australian standards for milk, which state that it must come from an animal. These products contain no lactose, so they are suitable for people who are lactose intolerant.

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History of milk

Since animals have become domesticated, they have become a source of milk, and other dairy products evolved from the milk.

For **nomadic** people in many African countries and northern China, camels and yaks were ideal animals with which to travel because they not only supplied milk, which could be drunk, churned into butter and fermented for yoghurt, but also provided meat when needed. The skin became clothing and lining for the walls of their houses. The animals were like a moving mini-department store.

nomadic Describes people of no fixed abode who move according to the seasons from place to place in search of food and water.

Milk is now usually purchased in cartons and plastic containers from a shop, but up until the late 1960s it could be delivered daily to your door. You supplied empty glass bottles that the milkman replaced with full ones. The milk was delivered daily because not everyone had refrigerators, but as they became common in households the need for a daily delivery decreased.

Primary production: Milk

homogenisation The process used to break down the fat particles in milk to a smaller size.

Figure 8.16 Milk production process

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Tasty Trivia In the 1960s, primary-school children were supplied with a small bottle of milk every day for morning tea. The milk was provided by the government as part of a public health scheme because of concerns that children in many households were not receiving their recommended daily dose of calcium. Although the scheme was well intentioned, the milk often sat unrefrigerated in the playground for several hours, so was warm and not very pleasant to drink.

8.11 INVESTIGATE IT

There are many varieties of milk available to purchase. These milks, such as no-fat or reduced-fat milk, all begin as full-fat milk.

1 Investigate the processing that occurs when producing no-fat or reduced-fat milk.

2 Design a flow chart to show the steps in milk processing, from milking the cow to the milk being available in the supermarket.

Types and properties of milk

Dairy milk has gone from being available only as the traditional full-cream variety to many different product types. Not only are there several varieties, but also several different ways of buying milk:

- powdered milk
- condensed milk
- **ultra heat treated (UHT)** long-life milk
- evaporated milk.

Why would customers buy these products rather than fresh milk?

ultra heat treated (UHT) Milk that is heated to a very high temperature for a short time, which means that it does not need to be refrigerated and has a long shelf life.

8.12 LET'S COLLABORATE

Do you drink milk? Name the type of milk you drink. How many other varieties of liquid milk can you think of? Try to name at least 10, then compare your results with those of the person next to you.

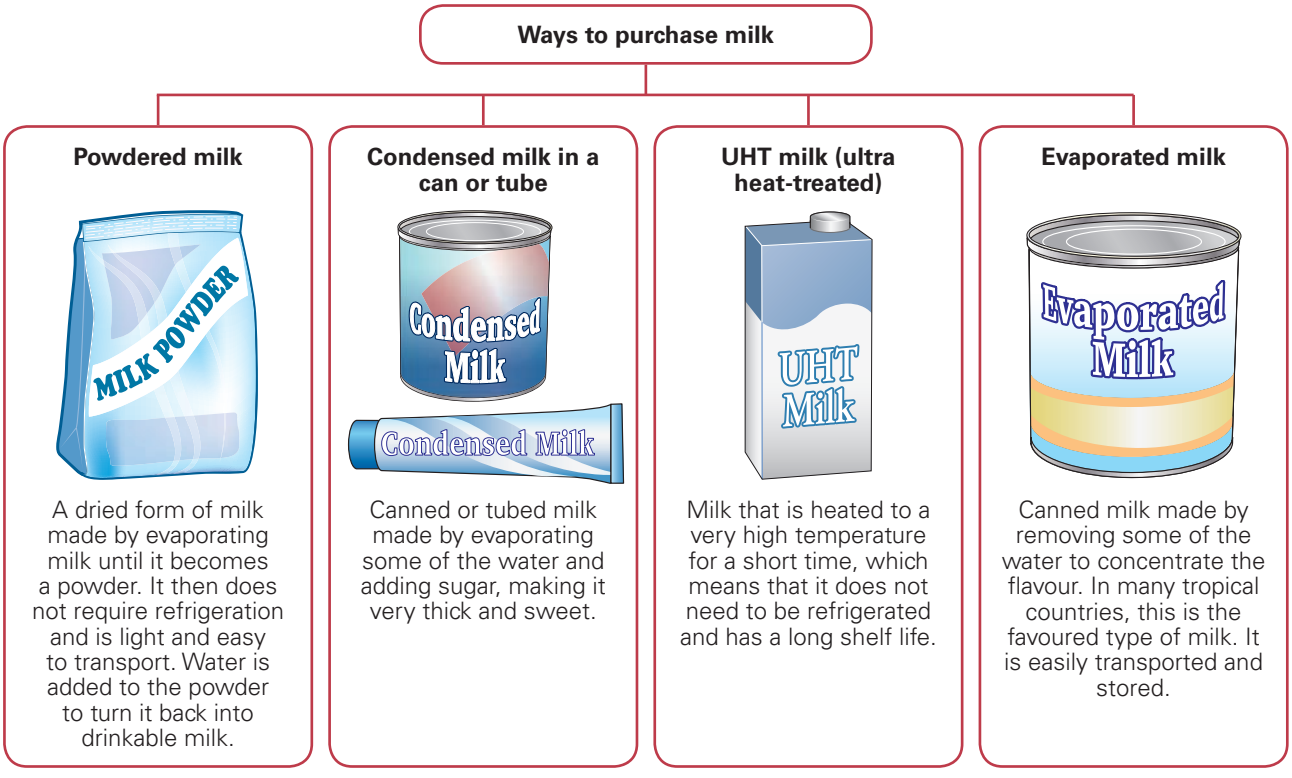

Figure 8.17 These four types of milk will all be available at your local supermarket.

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Quality considerations

Figure 8.18 Things to consider when purchasing milk

8.13 ACTIVITY

Milk tasting

Compare the physical and sensory properties of different varieties of milk by copying and completing this table.

Milk	Appearance	Aroma	Taste	Mouthfeel
Full-cream milk				
No-fat milk				
Reduced-fat milk				
Pauls Smarter White Milk				
Soy milk				
Rice milk				
Almond milk				
Lactose-free milk				
Goat's milk				
Organic milk				
A2 milk				

8.14 INVESTIGATE IT

What is the standard?

The sale of 'raw' (unpasteurised) milk for human consumption is illegal in Australia.

- Visit the Food Standards Code on the FSANZ website and find the definition of milk.
- See whether you can also find out the differences between 'milk' and a 'milk drink', or 'milk beverage'. List three examples in your response.

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8.6 Nutritional value of milk: Chemical properties

Like eggs, milk is also an almost perfect food; it is called a 'super food' because of the number of nutrients that can sustain life and growth, the most important of these being protein and calcium. Dietary fibre and iron are two significant nutrients that are lacking.

Life starts with milk being a critical food, and the importance of milk or milk-product consumption continues for the rest of our lives. Milk is a major source of protein, which is essential for body growth, as well as of calcium, which is also essential for bone growth and maintenance.

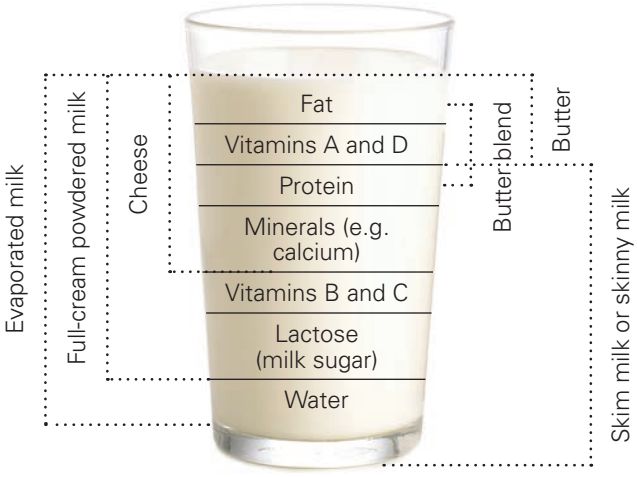
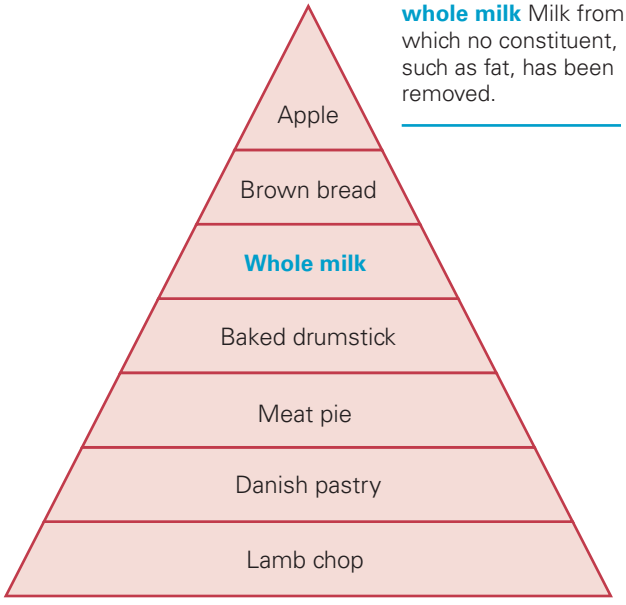


Figure 8.19 Nutrients in full-cream fresh milk and other milk products

Young children up to the age of two should have full-fat milk because it is an excellent source of vitamin A, which is important for brain development. After the age of two, low-fat milks are acceptable. Weight-conscious people can choose low-fat varieties, although many other popular foods have a much higher fat content than milk.



whole milk Milk from which no constituent, such as fat, has been removed.

Figure 8.20 Don't stop drinking milk because you think you will put on weight. Compare the amount of fat per 100 g of these foods.

8.15 INVESTIGATE IT

Lactose is the main sugar found in milk. It is broken down and digested in the body by an enzyme called lactase. People who are **lactose intolerant** are unable to digest the lactose found in milk and dairy products so they need to consume alternative similar products. They are the biggest consumers of soy products, such as milk, yoghurt and ice-cream.

1. Visit the So Good website to discover more about lactose-free products.
2. Create a poster that displays lactose-free alternatives for people who are lactose intolerant.

lactose intolerant Unable to digest lactose (milk sugar), such as that found in milk and cheese.

8.16 LET'S COLLABORATE

Cream is not on the diagram in Figure 8.19. Using the information shown, what nutrient do you think it contains? Is this an 'everyday' or a 'sometimes' food? Discuss with a partner.

Tasty Trivia

How else can you get one serve of dairy if you do not like milk? A 'serve' of dairy is equal to a 250 ml glass of milk, a 200 g tub of yoghurt or 40 g (2 slices) of cheese.

8.17 LET'S COLLABORATE

Which stage of the lifespan requires the greatest amount of milk? Explain why and discuss with your partner.

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8.18 ACTIVITY

Which milk is best?

Copy this table into your workbook and write your milk varieties in the left-hand column. Compare the nutrient content of the different milks.

Milk variety	Protein content	Calcium content	Sugar	Fat content	Any added nutrient such as iron
Full-cream milk					
No-fat milk					
Reduced-fat milk					
Pauls Smarter White Milk					
Soy milk					
Rice milk					
Almond milk					
Lactose-free milk					
Goat's milk					
Organic milk					
A2 milk					

1. Rank each milk according to its protein content, calcium content, sugar content and fat content, as well as added nutrients (such as iron).
2. Use a drawing of a ladder to rank the milks. Put the milk with the most of each nutrient at the top of the ladder and the lowest at the bottom of the ladder.
3. Identify the target market for each of the milks tasted.
4. Using the information from this chapter, suggest the type of milk or milks that would be best if you have the following requirements (justify your choice):
   - **a** You are vegan.
   - **b** You would like to consume no-fat milk.
   - **c** You are a 15-year-old and you want to make sure your bones develop as well as possible.
   - **d** You are lactose intolerant.
   - **e** Your grandpa likes the taste of real milk.
   - **f** You are making a milk drink for your two-year-old brother.
   - **g** You are calcium deficient.

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CREATE A SOLUTION

Your younger sister hates milk and fights with your parents every day when they pour her milk to drink. They know it is important for her to include milk and dairy every day to ensure she is consuming a balanced and nutritious diet. You need to design a high-calcium drink featuring milk for your sister. Your drink still needs to be healthy and nutritious, but it should not taste like milk so your sister will drink it without a fuss. It also needs to be quick and easy to prepare so she doesn't see you making it with milk.

Milk products

There are many varieties of milk products. These are foods made from milk and are available to buy to help vary your diet and act as milk substitutes. Milk products on the market are also referred to as dairy products.

Figure 8.21 displays the three most popular milk products. Other well-known milk products are different types of cream and ice-cream, and dairy desserts like custard. All the main products are available in low-fat, no-fat, low-salt and high-calcium versions. A less well-known milk product is **buttermilk**.

buttermilk The liquid that remains after butter is made from cream. It has a tangy, almost sour, taste and is used to make muffins, pancakes and some breads.

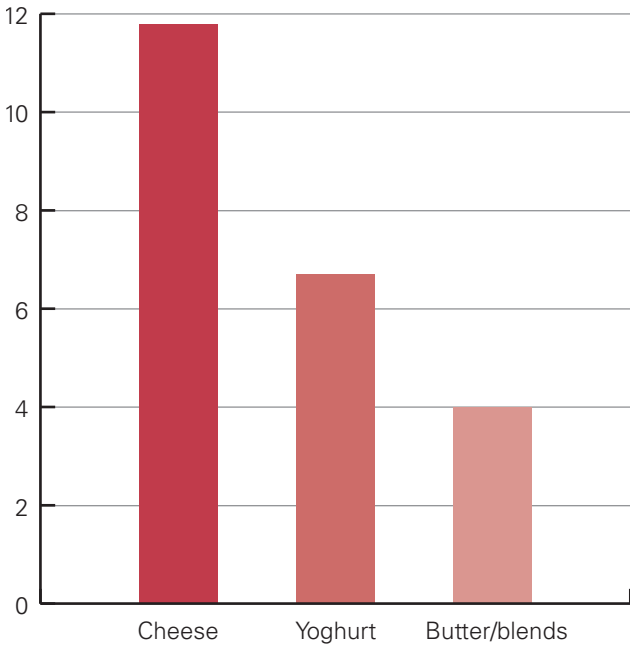

Figure 8.21 This graph shows the most popular milk products consumed per person in Australia.

REFLECT ON LEARNING

1. Name the source of the majority of milk consumed in Australia.
2. Describe two important steps in the processing of milk.
3. Outline why it is important for children to have full-fat milk, but many adults choose to consume reduced-fat or no-fat milk.
4. You want to store milk in a cupboard for emergency use. Suggest three types of milk that make this possible and list the advantages and disadvantages of each milk.
5. Identify the type of milk that is a suitable choice for an elderly person who needs to maintain strength in their bones. Justify your response.

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Apple pikelets

UNITED KINGDOM

Main tools and equipment

Whisk, medium bowl, grater, frying pan, egg lift, measuring cup, measuring spoons

Production skills

Measuring, melting, sifting, whisking, coring, grating

Cooking processes

Frying

SERVES 2

Preparation time: 10 minutes

Cooking time: 10–15 minutes

Serving and presentation time: 3 minutes

Total time: 23–28 minutes

Ingredients

 1 egg, beaten	 250 ml buttermilk	 1 tablespoon caster sugar	⅔ cup (100 g) plain flour
 ½ teaspoon baking powder	 15 g butter, melted	 ½ small Granny Smith apple, cored and grated	Extra butter

Method

1. Whisk the egg, buttermilk and sugar to combine.
2. In a medium bowl, sift the flour and baking powder. Make a well in the centre.
3. Pour into well the egg mixture, melted butter and grated apple. Mix until well combined with no lumps.
4. Heat a frying pan with a little bit of the extra butter to grease the pan.
5. When hot, pour ¼ cup of the batter into the pan. When bubbles appear on the surface of your pikelets and it is golden brown underneath, turn over using an egg lift. Cook until brown.
6. Remove from pan.
7. Add another small amount of butter and, when melted, repeat steps 5 and 6.

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CREATE A SOLUTION

Your pikelets are ready to eat, but there is no garnish or topping included in the recipe. Design a garnish or topping to complement your apple pikelets.

8.19 LET'S COLLABORATE

Since the mid-1980s until the last four years, the average annual milk consumption has been around 100 litres per person. With a partner, suggest why we have not seen dramatic increases in milk consumption, even though science and nutrition knowledge provide more and more evidence that we need milk for bone growth. What changes do you predict for the future?

8.20 ACTIVITY

What dairy products do you consume?

1. Using Survey Monkey, design a survey to gather data on the types of milk and milk products households buy. Set up survey questions to get the answers you will need to complete the task. Each group could survey a different product and the class could then compile the results. If households buy more than one variety of each product, record all varieties.
2. Graph the results using a bar graph via an ICT graphing program.
3. Write a conclusion about the most popular variety of milk and the most popular milk products consumed in your class.
4. Compare the proportions of milk, cheese, yoghurt and butter consumed by the Australian population and your class. Suggest reasons for the similarities and/or differences.

Check out cheese

starter A culture that starts the process of coagulation of the protein.

rennet Made from rennin, an enzyme used for clotting milk. It occurs naturally in the stomach lining of mammals. It coagulates or clots the protein in milk, making it easier to digest.

Cheese is made from the coagulated milk of cows, goats, buffalo and sheep. The milk needs a **starter** such as **rennet** to start the coagulation process. Like eggs, because cheese contains a lot of protein it will toughen and go rubbery if over-cooked. As there are many different cheeses produced in different ways, you need to select the best type for food preparation. For example, have you noticed that when you have a good pizza, the cheese has melted and it stretches into very thin strands? This is often a soft cheese called mozzarella. A very hard cheese such as parmesan is best for grating on top of a lasagne or for flavouring cheese sauces.

Tasty Trivia

The early Greeks used fig tree branches as rennet to start the coagulation of the milk.

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Cheese is made by adding rennet to milk. This sets the milk solids, and **curds** and **whey** form. The curds are drained and salt is added, resulting in soft, fresh cheese. The cheese is then pressed; the amount of pressing determines whether you get a soft cheese or a hard cheese. A hard cheese has been firmly pressed over a period of time and then left to mature to develop flavour and texture. Have you ever tried blue-vein cheese? Some cheeses such as blue-vein varieties are injected with harmless moulds that spread throughout the cheese, giving it a sharp flavour.

curds The solids in milk, formed when the protein has coagulated after the addition of rennet or lactic acid.

whey The liquid in milk, left when cheese is made.

You could conduct a cheese tasting of one of each of the cheeses mentioned in Figure 8.22. This is dealt with in more detail in the extended response activity at the end of this chapter.

DESIGN THINKING

Have you ever eaten junket (like Little Miss Muffet's curds and whey)? It is very easy to make. Investigate what ingredients you will need to make junket. Produce your junket and enjoy!

Tasty Trivia

It takes about 10 litres of milk to make 1 kilogram of cheese.

Type of cheese	
Fresh cheese: unripened curd. Eaten while fresh. Examples are cottage cheese, ricotta, mozzarella, feta. 	**Soft cheeses:** briefly ripened, usually have a high percentage of fat and moisture. Spread easily. Examples are brie, camembert, feta. 
Semi-hard cheeses: matured with less moisture. Can be grated and melt easily. Easy to cut. Examples are cheddar, edam, gouda. 	**Hard cheeses:** matured for a long time, have a low moisture content and a higher fat content. Good for grating and melt easily. Examples are parmesan, pecorino. 
Blue and smoked cheeses: have a strong flavour; they may be soft, semi-hard or hard. Examples are Castello Blue, stilton, gorgonzola.  	

Figure 8.22 Types of cheese

DESIGN BRIEF: PIZZA

Decide for yourself which is best: your homemade pizza or frozen supermarket-bought pizza. Using the Perfect pizza recipe on p.218, produce your own homemade pizza. Time how long it takes for you to prepare and produce it.

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Perfect pizza

ITALY

RECIPE

Main tools and equipment

Small bowl, rolling pin, measuring spoons, measuring cups, measuring jug, pizza tray, spatula

Production skills

Activating yeast, slicing, kneading, rolling, proving

Cooking processes

Baking

SERVES 2

Preparation time: 30 minutes

Cooking time: 15–20 minutes

Serving and presentation time: 2 minutes

Total time: 47–52 minutes

Ingredients

 1 tablespoon olive oil	 1 teaspoon yeast	 ½ teaspoon sugar	 ½ teaspoon salt	 ⅓ cup warm water	 1 cup plain flour
 2 tablespoons tomato paste	 ¾ cup grated cheese (mozzarella)	 ¼ onion, grated	¼ cup pineapple pieces	1 slice ham, thinly sliced	
 1 slice salami, thinly sliced	 ¼ capsicum, diced	 ½ teaspoon mixed herbs			

Method

1. Grease a pizza tray with a tiny amount of oil.
2. Combine the yeast, sugar, salt and water in a small bowl. Cover and stand for 10 minutes until frothy.
3. Sift the flour into a large bowl.
4. Add the yeast mixture and olive oil. Mix to form a dough.
5. Flour your bench and knead the dough until smooth and elastic.

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6 Lightly oil a bowl. Place dough in bowl, cover and prove for 15 minutes or until it has doubled in size.

7 Turn dough onto floured surface and roll into a round shape to fit the pizza tray. Line the tray with the dough.

8 Spread the base with the tomato paste. Do not spread the tomato paste all the way to the edge as it will burn.

9 Top with cheese, onion, pineapple, ham, salami, capsicum and mixed herbs.

10 Bake at 200°C for 15–20 minutes or until ready.

Evaluating

Purchase a frozen pizza and prepare it according to the instructions provided. Copy and complete the table below, then answer the questions that follow to help you investigate and compare the two pizzas and evaluate which is your preferred option.

	Homemade pizza	Frozen pizza
Time taken to prepare		
Appearance		
Aroma		
Flavour		
Texture		
Give each pizza a rating out of 5 (with 5 being the highest score)		

1 Identify which pizza presentation you preferred and explain why.

2 Identify which pizza you think had the best flavour and explain why.

3 List the ingredients you used to make your pizza.

4 List the ingredients used to make the frozen pizza as written on the label.

5 Identify which pizza is the healthier option.

6 Compare the time taken to prepare both pizzas. Discuss which pizza was the more time-efficient.

7 Determine which pizza was your favourite. Explain why.

8.21 ACTIVITY

Changing milk

1 Put 3 tablespoons of milk into a small saucepan.

2 Heat the milk until it boils. Observe and record what happens when milk boils.

3 Remove the saucepan from the stove. Add ½ teaspoon lemon juice. Observe and record what happens when an acid like lemon juice is added to milk. The changes that occur are:

   a The skin on boiling milk is coagulated milk protein.

   b Adding lemon juice curdles the milk and creates curds and whey. The solid curd you see is what is created first in cheese making.

4 Discuss whether you think it would be possible to make a milkshake with milk and lemon juice.

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8.22 ACTIVITY

Heat and cheese

1. Use a griller to test the impact of heat on cheese. Place the griller rack as high as possible and preheat the griller on high.
2. Cut three slices of low-fat cheese 3 mm thick and approximately 3 cm square.
3. Cut three slices of full-fat cheese the same size.
4. Place on foil.
5. Place under the griller for 1 minute on high.
6. Observe the changes.
7. Place the cheese back in the griller and continue cooking for 1 minute.
8. Observe the changes.
9. Place back under the griller and cook for a further 1 minute.
10. Observe the changes.
11. Write a conclusion about the impact of dry heat such as a griller on cheese.
12. Make a recommendation to a beginner cook about how long it is necessary to melt cheeses on an open sandwich.

A similar test can be conducted in a microwave:

1. Cut three slices of cheese 2 mm thick and approximately 3 cm square.
2. Place on kitchen paper.
3. Microwave for 15 seconds on high.
4. Observe the changes.
5. Place the cheese back in the microwave and heat for a further 10 seconds.
6. Observe the changes.
7. Place back in the microwave and heat for a further 5 seconds.

Describe the differences between the cheese heated in the microwave and the cheese heated under the griller.

DESIGN BRIEF: MINI FRITTATAS

Use cheese to add the properties of flavour, taste, texture and nutrients to a popular egg dish. The recipe below is for Mini Frittatas, but it can be made as one frittata, like an omelette, and served cut into wedges. Frittatas can be made using a variety of vegetables – for example, spinach, broccoli or a mixture of cooked vegetables such as potato, capsicum, onion, peas, tomatoes and pumpkin. It is a good way to use up leftover cooked vegetables. It can be served for breakfast, lunch or dinner.

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Mini frittatas

ITALY

RECIPE

Main tools and equipment

Muffin tin, frying pan, fork, measuring spoons, measuring cup, garlic crusher, fork, large bowl, wooden spoon

Production skills

Measuring, slicing, greasing, beating, combining

Cooking processes

Stir-frying, baking

MAKES 12

Preparation time: 20 minutes

Cooking time: 10–15 minutes

Serving and presentation time: 3 minutes

Total time: 33–38 minutes

Ingredients

 2 teaspoons olive oil	 1 spring onion, finely sliced	 1 clove garlic, crushed	 Pinch of dried oregano	 1 small zucchini (100 g), coarsely grated	 ¼ cup frozen peas
 2 semi-dried tomatoes, diced	 3 eggs	 ¼ cup smooth cottage cheese	1 tablespoons parmesan or tasty cheese		
 Salt and pepper	 25 g ham, diced (optional)	 1 teaspoon chopped parsley (optional)			

Method

1. Preheat the oven to 190°C.
2. Lightly brush a ½ cup muffin pan with olive oil.
3. Heat the oil in a frying pan over moderate heat.
4. Stir-fry the spring onion, garlic and oregano for 2–3 minutes, being careful not to let it burn.

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Mini frittatas – continued

5 Squeeze any excess liquid from the zucchini using a clean tea towel and add to the pan with the peas and tomato and stir for 2 minutes.

6 Remove from the heat and place in a bowl.

7 Beat the eggs with a fork and beat the cottage cheese until it is smooth, then stir in the egg and 2 teaspoons cheese.

8 Combine the egg mixture and the zucchini mixture. Add ham if desired. Flavour with salt and pepper. Stir thoroughly.

9 Spoon the mixture into the muffin pan.

10 Sprinkle the cheese on top. Bake at 190°C for about 10–15 minutes, until the frittatas are cooked through and lightly browned.

Evaluating

1 Describe the changes to the cheese on top of the frittatas before cooking and after cooking.

2 Using your knowledge of cooking eggs, explain the changes to the frittatas before cooking and after cooking.

3 Suggest two vegetables you could add to the frittatas to change the texture of the frittatas. Describe the texture change you would expect from your addition.

REFLECT ON LEARNING

1 Name three of the most common milk products.

2 When cooking, heat has a similar impact on egg and cheese. Describe these similarities.

3 Identify the nutrient that causes the changes in cheese while heating.

4 Explain the differences in processing between fresh cheese like ricotta and hard cheese like parmesan.

5 Describe the properties cheese adds to a meal like an omelette when sprinkled on top.

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Check out yoghurt

Yoghurt is a **cultured** milk product to which two types of bacteria are added. These cultured bacteria act on the lactose and the protein found in milk to give it a soft curd with a slight acidic taste. Yoghurt is rich in protein and calcium, making it a tasty and nutritious snack option as well as being a great addition to meals.

cultured Grown or propagated in an artificial medium.

8.23 LET'S COLLABORATE

Suggest ways you could incorporate more yoghurt into your diet. Highlight any current ingredients and recipes where you could make modifications for yoghurt.

DESIGN THINKING

Yoghurt is a quick and easy snack that can also be used in many different ways in cooking. It is also very easy to make your own homemade yoghurt.

1. Research the main ingredients used in yoghurt.
2. Investigate how to make natural yoghurt at home.
3. Research three different flavourings you could use for your yoghurt.
4. Create a production plan, including the equipment you will need to produce your yoghurt and the time it will take.

Producing

Produce your flavoured yoghurt.

Evaluating

1. Complete a sensory analysis of your yoghurt.
2. Complete a cost analysis of your homemade yoghurt compared with a commercially available version. Describe which is the most cost-effective.
3. Reflect on your project-management skills. Outline what you did well in your production today and two areas on which you should focus when needed in the kitchen.

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LOOKING BACK

1 Eggs are one of the most versatile ingredients used in cooking.

2 Eggs and milk are both described as almost perfect foods because they can sustain life with a high protein content and many other nutrients (but not dietary fibre).

3 The high protein content influences cooking of eggs and cheese, as protein sets when heated (coagulation) and becomes tough and rubbery when overcooked.

4 Eggs can be purchased in different sizes and different types, depending on how the hens or other birds are kept.

5 Milk is also available in many different types, and many popular products, like cheese, butter, yoghurt, cream and ice-cream, are made from milk.

6 Cheese is the most popular processed milk product and comes in many varieties, depending on the production process, from very fresh and unripened to very hard and mature.

7 Yoghurt is a cultured milk product, rich in protein and calcium.

TEST YOUR KNOWLEDGE

Multiple choice

1 When cooking eggs:
- **a** the white and yolk cook at the same time
- **b** the white cooks first
- **c** the yolk cooks first
- **d** they cook from the inside out.

2 Skimmed powdered milk has had:
- **a** the water removed
- **b** the water and fat removed
- **c** the fat removed
- **d** the lactose or sugar and water removed.

3 Coagulation is the process of:
- **a** adding rennin to milk and heating to get curds and whey
- **b** the process used to break up the fat particles in milk
- **c** heating milk to just below boiling point to kill micro-organisms
- **d** the changing of a protein from a liquid to a solid when heated or agitated.

True/false

1 Dietary fibre is one nutrient that is not present in milk or eggs.

2 Overcooked protein in eggs is soft and moist.

3 Yoghurt is a 'sometimes' food because it is high in saturated fat.

Short answer

1 Following is some information about the milk and milk products we consume and the changes that have occurred in the patterns of what we eat or drink. Select one of the changes and explain possible reasons for this change.
- **a** From the mid-1990s, we have been drinking less and less milk.
- **b** The amount of cheese we eat has stayed about the same, with a shift from cheddar to non-cheddar varieties.
- **c** The amount of butter we ate slowed during the 1970s and 1980s; however, this has changed over the last 10 years and we are now eating more butter.
- **d** The amount of yoghurt we eat has shown the biggest and steadiest increase from the 1990s.

2 Eggs are used for many different purposes in cooking. Select one purpose, give an example of a meal or recipe that uses an egg in this way and describe what happens to the egg in this meal/recipe.

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Extended response

Conduct a cheese tasting in a group of four. The same process can be used for a milk tasting. For milk, try different milk varieties in a 'blind tasting' (put the milk in a plain glass so no one can see the milk container). You will need:

- four plates
- four different cheeses, if possible: one fresh or soft, one semi-hard, one hard and one flavoured
- one glass of water each
- one celery stick each.

Method

1 Copy the table below to record the cheese-tasting results.

Name of the cheese	Appearance	Texture	Taste	Ranking (individual preference)

2 Cut each variety of cheese into four.

3 Label each variety of cheese.

4 As a group, brainstorm descriptive words for the appearance, texture and taste of the cheese.

5 Taste the cheeses one at a time, starting from the fresh or soft and working up to the flavoured cheese. Record your results. It is important to have a drink of water and a bite of celery to cleanse your palate before you taste the next cheese.

6 Individually rank each cheese. Give an explanation of why you have ranked the selected cheese as number 1. Use your descriptive words from the tasting in your response.

7 Compare your ranking with the ranking of the group. What was the most popular cheese in the group and in the class?

8 Complete a KWLH for the cheese tasting. Circle the word representing the letter:

a K – What do you *know* about cheese?

b W – What do you *want* to find out about cheese?

c L – What have you *learned* about cheese from this tasting?

d H – *How* did you learn during the tasting?

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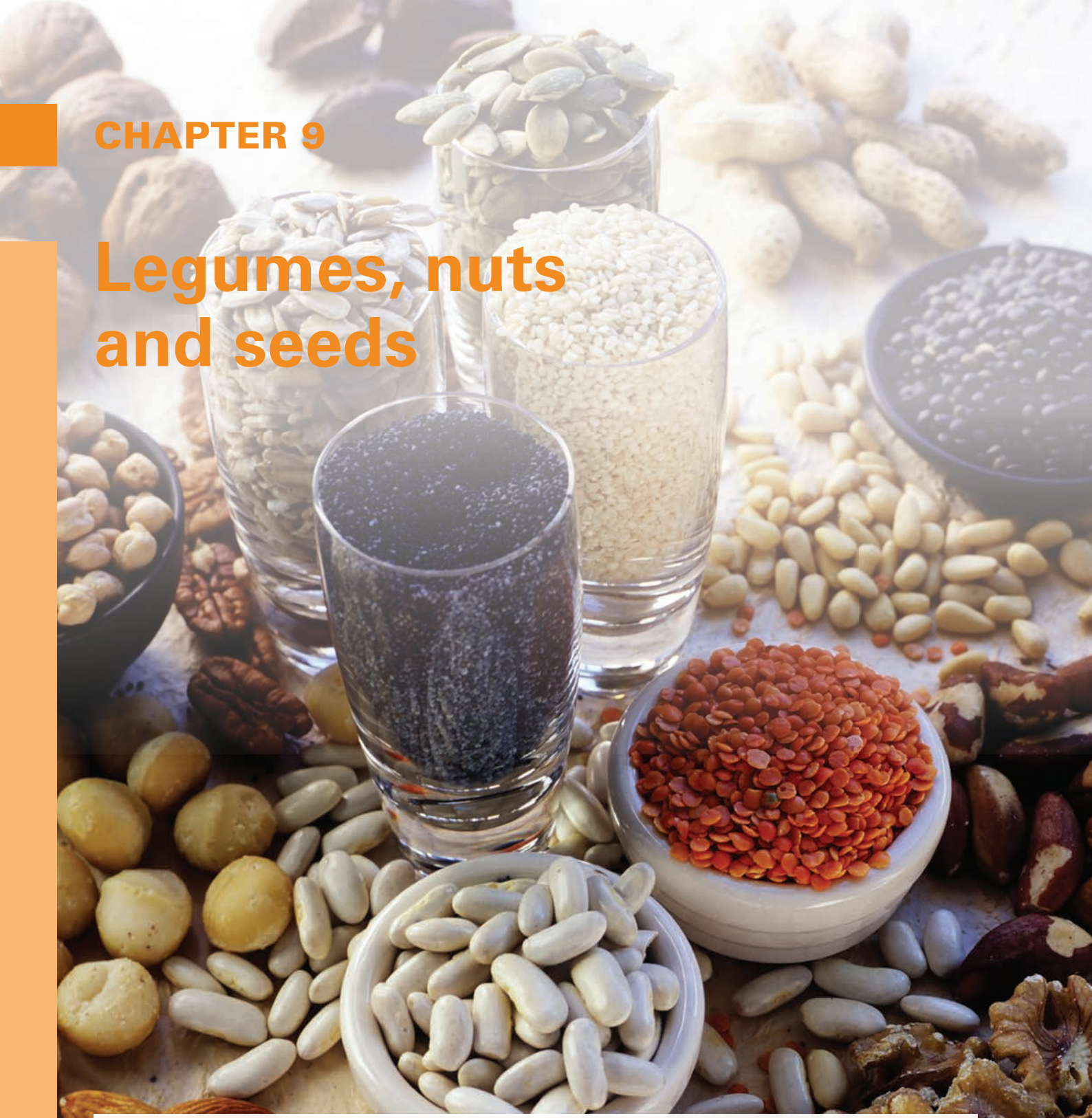
CHAPTER 9

Legumes, nuts and seeds



ACCESS PRIOR KNOWLEDGE

1. Define the term 'legume'.
2. Name as many different types of seeds as you can.
3. Outline the nutritional benefits of consuming nuts.
4. 'Meat-free Monday' is a campaign to include more legumes in your diet. Suggest four healthy meat-free meals you could make to feed your family.
5. Discuss why baked beans are good for your heart.

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9.1 Legumes, nuts and seeds: The basics

Legumes, nuts and seeds taste great and feature in many popular and delicious meals and food products around the world. By definition, **legumes** are the seeds from some pod-bearing plants, but they are most commonly recognised and known by people as beans, lentils, chickpeas and peas.

legumes The seeds from some pod-bearing plants.

Legumes are also often referred to as **pulses**, which are in fact dried legumes. While legumes grow on plants, **nuts** grow on trees and are defined as edible kernels in a hard shell. **Seeds** are dried from the flowers or fruits of plants such as the poppy, sesame, pumpkin and sunflower. Legumes, nuts and seeds are all very good sources of protein and are an important part of ensuring a balanced diet.

pulses Dried legumes.

nuts Edible kernels in a hard shell.

seeds The flowers or fruits of plants such as the poppy.

9.1 ACTIVITY

Introducing legumes

Have you ever had legumes, nuts or seeds before? Chances are you have, but you may not have realised it at the time. Below is a list of different food products made from legumes, nuts and seeds. Discover how many of these food products you have already consumed and enjoyed. Copy the table into your workbook and complete it (except for the last column) to discover your legume, nut and seed culinary experiences.

Food	Country of origin	Have you ever eaten this?	Did you enjoy this food?	Legume, nut or seed?	Class tally
Hummus					
Baked beans					
Dhal					
Falafel					
Frijoles					
Tofu					
Baklava					
Tahini					
Friand					
Chilli con carne					
Minestrone					
Almond milk					
Sesame snaps					
Praline					
Soy sauce					
Pesto					
Poppy seed cake					

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9.1 ACTIVITY continued

Figure 9.1 Falafel

Figure 9.2 Lemon and pistachio friands

Figure 9.3 A bowl of tahini

Collect and collate the responses from your classmates to determine the most and least consumed food products.

1. Graph the information gathered from your survey by using a computer graphing program or drawing by hand. Remember to label your axes correctly and give your graph an appropriate title. You also need to include a key for your data.
2. Based on the graph, which product has been consumed by your class most often?
3. Identify any products that nobody has tried before.
4. From the information in the table, identify which product you liked the most.
5. List any products that you did not enjoy.

DESIGN BRIEF: LEGUMES

Hummus is made using legumes. Prepare this dip and another dip that is low in fat and high in fibre, and that contains legumes. After your production, complete the evaluation questions.

You may like to serve this with bread. Ask your teacher about the recipe for Flat Bread that is available in the Teacher Resource Package.

Tasty Trivia

The word *hummus* means chickpea in Arabic.

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Hummus

Main tools and equipment

Food processor, small bowl, wooden spoon, measuring spoons, juicer

Production skills

Blending, presenting

SERVES 2

Preparation time: 10 minutes

Serving and presentation time: 5 minutes

Total time: 15 minutes

Ingredients

 150 g chickpeas, tinned	 ¼ teaspoon ground cumin	 Juice of 1 lemon	 2 cloves garlic	 3 tablespoons (60 ml) water
 2 tablespoons tahini	 2 tablespoons yoghurt	 Pinch paprika (garnish)	Turkish or pita bread	

Method

1. In a food processor, blend the chickpeas, cumin, lemon juice, garlic and water until the mixture looks like a thick cream or paste.
2. Spoon in the tahini and yoghurt. Blend again until combined.
3. Add additional water – just a small amount at a time – if consistency is too thick.
4. Add salt and pepper to taste.
5. Present on a plate and sprinkle with paprika for colour.
6. Serve with fresh bread such as Turkish or pita bread and/or vegetable sticks.

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Hummus – continued

Evaluating

1 Complete a taste comparison test of the prepared chickpeas and the hummus. Compare the similarities and differences between the main ingredient and the hummus using a Venn diagram.

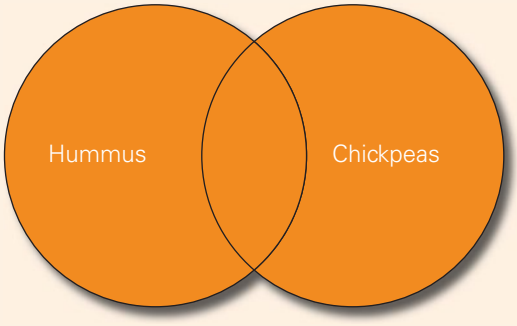
2 Using your sensory analysis skills, describe the appearance, aroma, taste and mouthfeel of your hummus.

3 Hummus is an 'everyday food'. Explain why.

4 List three different ways in which you could use your hummus.

5 Describe another way in which you could present your hummus.

6 Suggest why people might choose to use canned chickpeas when they produce this recipe.



9.2 LET'S COLLABORATE

Legumes have been produced and eaten all around the world for many years. Why do you think this is the case? As a class, see whether you can come up with three or four different reasons. (*Hint*: think about cultural, nutritional, economic and environmental reasons.)

Figure 9.4 Legumes, nuts and seeds can become part of every meal.

History of legumes, nuts and seeds

Legumes have been a **staple food source** all over the world for centuries because they are cheap to produce and purchase, and are very filling. In fact, the lentil is claimed to be the first food ever grown and harvested as a food source by humans. Mexico cultivated the first kidney, pinto and black beans, while China is famous for its soy and adzuki beans. Lentils were found in the tombs of the Egyptians for the pharaohs to eat in the next world.

staple food source
A food that is eaten regularly and in large quantities. It is the most eaten product in the diet.

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Today, legumes are available worldwide and their use in recipes has increased, with legumes becoming a popular alternative to meat. They can be eaten fresh or dried, and are available canned for easy preparation and use.

9.3 LET'S COLLABORATE

List examples of Australian staple foods. Select two different countries and discuss what you believe their staple food products are.

Nuts and seeds were the original snack food for the human race. Before food cultivation, humans would hunt and gather their foods, and nuts were a significant food source during these times. They were easy to gather and store as well as tasty and nutritious.

Tasty Trivia The macadamia and bunya nuts are the only nuts indigenous to Australia. All other nuts grown in Australia have been introduced and cultivated.

REFLECT ON LEARNING

1. Explain the differences between legumes and pulses.
2. Discuss why legumes are commonly eaten by vegetarians.
3. Lentils were found in the tombs of the pharaohs. Suggest why they were left there.
4. Outline the reasons why legumes are a staple food source for many countries.
5. Describe why nuts are often used as a snack food.

9.4 INVESTIGATE IT

Visit the supermarket or Coles Online and complete the following cost-comparison chart. Before you start, predict which protein source you believe is the cheapest per 100 g and which is the most expensive per 100 g. Then answer the questions that follow.

Product	Cost and amount of the item	Cost per 100 g	Ranking from best price to most expensive
Fillet steak			
Chickpeas, dried			
Chickpeas, tinned			
Lamb chops			
Chicken fillets			
Lentils, dry			
Lentils, tinned			
Salmon fillets			
Rump steak			
Low-fat beef mince (5 star)			

1. Identify which protein source is the most affordable. Explain your answer.
2. Identify which protein source is the least affordable. Explain your answer.
3. Suggest the most sustainable protein source. Justify your response.
4. Describe what you have learnt from completing this activity. Did any of the results surprise you? Discuss your response.

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9.5 ACTIVITY

Pricey protein

Legumes should be our number one protein source:

- It takes up to 30 times less land per kilogram to produce legumes compared with meat.
- It takes 25–35 kg of legumes of feed to produce 1 kg of meat. Think about the number of meals you could make with 25 kg of legumes, compared with 1 kg of meat.
- Land is being cleared for meat production, resulting in **land degradation**.
- Legumes are an extremely economical protein source:
  - They cost less to produce, manufacture, transport, store and prepare.
  - They have a much longer shelf life.
  - Once dehydrated or canned, they do not require refrigeration until cooked.
  - They can be packaged in recyclable and reusable materials.
  - They are just as versatile as meat.

land degradation
Deterioration of the quality of the land until it is no longer able to be used.

1. Describe how this issue of sustainable protein production makes you feel.
2. Compare how often you eat meat vs legumes at home.
3. Describe the changes you would have to make to your diet if meat were only consumed occasionally.
4. Explain the importance of protein in the human diet.
5. Present the arguments for both sides of this issue.
6. Justify your position on this issue.
7. Design a marketing campaign providing reasons why people should be consuming meat-free but protein-packed meals every week.

9.2 Quality considerations: Sensory properties

When purchasing legumes, nuts and seeds, you should consider the following characteristics:

- no signs of dirt or discolouration.
- packaging should show no signs of damage, in particular cans not dented
- skin should not be wrinkly.

Dried and canned legumes and seeds should be stored in a cool, dry pantry in an airtight container. Although they do have an extended shelf life, they should be consumed within six months. Once cooked, legumes need to be refrigerated and eaten within two or three days.

Figure 9.5 The characteristics of high-quality legumes

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Figure 9.6 Legumes and nuts can be purchased in a variety of ways.

Storing nuts

Because of their fat content, correct storage of nuts is important. They do have a shelf life and will go **rancid** after a while. To keep nuts fresher for longer, it is a good idea to store them in your refrigerator; otherwise, they can be kept in a cool, dry pantry in an airtight container.

rancid Describes a stale smell and flavour in fats and oils.

9.3 Nutritional value of legumes, nuts and seeds

Legumes, nuts and seeds are often described as some of nature's 'super foods' because they have a high nutritional value and are a cheap source of protein. They are inexpensive to produce, which makes them very affordable. In many countries, legumes and nuts are used instead of meat in everyday meals, with meat only being eaten on special occasions, as meat is costly to produce and expensive to consume.

Legumes, nuts and seeds have been an important protein source throughout history, and continue to be the major protein source for **vegetarians** and **vegans**, as they are a great alternative to meat. Legumes and nuts are an incomplete protein source, and therefore need to be combined correctly to ensure they provide a complete source of protein to make up a healthy diet. For example, beans and rice should be eaten together to create a complete protein source.

vegetarian Generally, a person who eats eggs and dairy products, but does not eat any animal flesh (this type of vegetarian is called lacto-ovo).

vegan A person who does not eat or use any animal products and eats only plant foods.

9.6 LET'S COLLABORATE

Research and discuss the differences between complete and incomplete protein. Outline the reasons for including protein in the diet.

Legumes are high in carbohydrates (but low in GI carbohydrates), fibre, folate and iron, making them a healthy food choice. Legumes are also low in fat.

Some people are cautious about eating nuts due to their high fat content, but nuts are a sensational snack food as they not only taste great but also contain many vitamins and minerals. They are, in fact, a source of **'good' fats**. (Fats are discussed further in Chapter 10.) As you can see from the Venn diagram in Figure 9.7 on p.234, the significant nutritional difference between legumes, nuts and seeds is fat content. While there are many similarities in nutritional composition, nuts do contain amounts of fat and some nuts are extremely high in polyunsaturated fat. On the whole, nuts are generally a nutritious food: they are a high source of protein and therefore another good food choice for vegetarians. It is important to eat small amounts of nuts at a time due to their high fat content. It is recommended that we eat only a handful of nuts per day, but we are encouraged to eat more legumes, which are very low in fat, every day.

'good' fats Fats that tend to lower cholesterol levels when they replace saturated fats in the diet, thus reducing the risk of heart disease.

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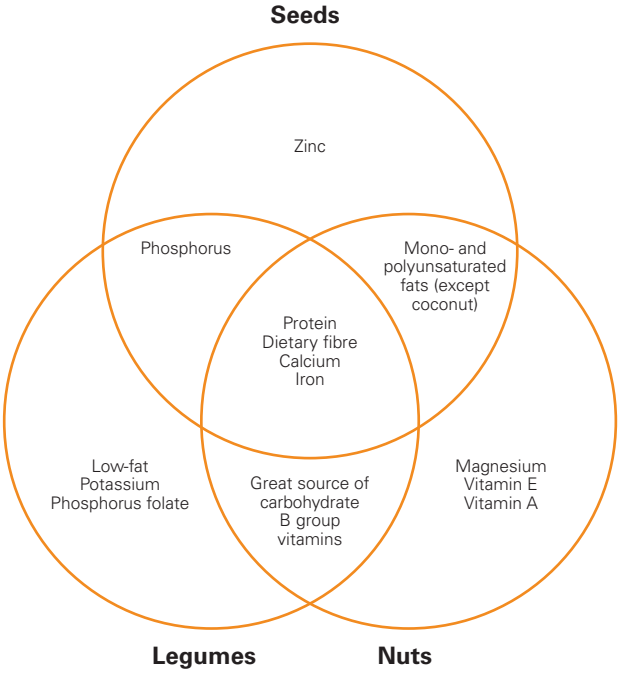

Figure 9.7 Comparing the nutritional properties of legumes, nuts and seeds

Tasty Trivia

The soybean is the only product in the legume family that is a complete source of protein. Soybeans have been cultivated by Chinese farmers since approximately 1100 BCE.

9.7 ACTIVITY

Which nut?

Using this fat content graph, answer the following questions.

1. Identify which nut has the lowest fat content.
2. Identify which nut has the highest fat content.
3. People often avoid nuts because of their fat content. Is this justified? Explain your response.
4. Discuss why nuts are a great snack food for outdoor activities like hiking.

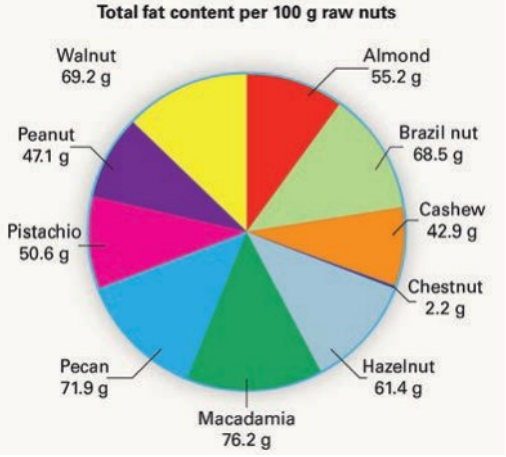

Figure 9.8 Total fat content per 100 g raw nuts

9.8 ACTIVITY

Nuts for sale

Nuts are often sold and served salted.

1. Explain why you think nuts are salted.
2. List the varieties of nuts you can buy salted.
3. Discuss how salting nuts could have an impact on their nutritional properties.
4. Explain why it is better to buy and cook with unsalted nuts.
5. Complete a taste test of a salted and an unsalted nut and compare the differences.
6. List which nut you prefer and explain why.

DESIGN BRIEF: VEGETARIAN DINNER

You have a friend coming over for dinner who is a vegetarian. You have bought some tofu and either have to design your own tofu recipe or try the following Fried Tofu and Dipping Sauce recipe. You also need an accompaniment to ensure you prepare a filling and tasty meal. Design a salad or vegetable dish suitable for a vegetarian that uses Asian flavours to complement your fried tofu. Or design your meal using tofu as your key ingredient. You don't have much time, so whatever you make needs to be quick.

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Fried tofu and dipping sauce

JAPAN

Main tools and equipment

Plates, chopping board, chef's knife, measuring spoons, measuring cup, measuring jug, frying pan, tongs

Production skills

Crumbing, slicing, whisking

Cooking processes

Shallow frying

SERVES 1 OR 2

Preparation time: 15 minutes

Cooking time: 10 minutes

Serving and presentation time: 5 minutes

Total time: 30 minutes

Ingredients

Fried tofu

 ¼ block tofu (90 g)	 2 tablespoons cornflour	 Pinch salt	 Pinch white pepper	 ½ egg, whisked	 ¼ cup panko breadcrumbs
 ¼ cup oil, for shallow frying	 ¼ spring onion, finely sliced	 ¼ chilli, finely sliced			

Dipping sauce

 1 tablespoon soy sauce	 1 teaspoon rice wine vinegar	 ¼ teaspoon sugar	½ teaspoon sesame oil	¼ spring onion, finely sliced
 ¼ chilli, finely sliced	 1 teaspoon ginger, minced	 1 clove garlic, finely chopped	¼ teaspoon sesame seeds	

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Fried tofu and dipping sauce – continued

RECIPE

Method

1. Slice tofu into 6 even-sized cubes.
2. Season cornflour with salt and pepper.
3. Prepare three separate plates ready for the three-stage crumbing: one has cornflour, one has beaten egg and the other has breadcrumbs.
4. Coat the tofu in the cornflour, egg and then breadcrumbs.
5. Heat oil in a frying pan.
6. Shallow fry the tofu gently, turning over when each side browns.
7. Drain on paper towel.
8. For the dipping sauce, prepare all ingredients, then combine.
9. Serve tofu and dipping sauce garnished with finely sliced chilli and spring onion.

CREATE A SOLUTION

Oh no! You have just found out your friend is vegan, not vegetarian. Redesign your tofu meal to ensure that your final meal solution is suitable for you to serve to them.

Start by identifying any ingredients that would not be eaten by a vegan, then suggest other alternative ingredients that you could use to modify or change the recipe.

Remember resistant starch

Resistant starch is a type of fibre that is unable to be digested by the body. Legumes are high in resistant starch. This type of fibre is called resistant because it is unable to be digested by the small intestine and passes through the body to the large intestine where it is broken down by fermentation. Resistant starch is also a vital component of a healthy digestive system – it keeps your bowels regular.

Canned beans

Canned beans can be a great source of vitamins C and B; however, the resistant starch found in canned legume products is hard for the body to digest, which can cause unwanted discomfort. There are a number of steps you can take when cooking with canned beans to help your body digest them easily. Try these tips the next time you make your own baked beans:

- Change the water a number of times during the soaking process. Don't use this water when cooking – start your recipe with fresh water.
- Simmer the beans slowly until they are tender – this makes them easier to eat and digest.
- When introducing canned beans into your diet, your body needs time to adjust to them. Start to eat them in small amounts and gradually increase your intake.
- If you are really worried about discomfort, eat lentils: they are broken down by your body much more readily.

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9.9 ACTIVITY

Researching resistance

There are a number of reasons why the body is unable to digest resistant starch. Go to the Australasian Science website and research resistant starch to answer the following questions.

1 Complete a PMI chart on what you have researched about resistant starch. Write at least four points for each column.

P(lus)	M(inus)	I(nteresting points)

2 Explain why our bodies cannot digest resistant starch.

3 Outline any health conditions that are linked to resistant starch and describe the connection.

4 Design a podcast or infographic to inform consumers about resistant starch. Include the following:

- **a** the recommended amount of resistant starch we should eat every day (on average, we consume 5–7 g per day)
- **b** why it is important to include resistant starch in our daily diets
- **c** foods that contain resistant starch.
- **d** at least five tips for ways to increase resistant starch consumption. (Here's one to get you started: add chickpeas to your rice or pasta salad.)

Figure 9.9 Baked beans, the musical food!

9.4 Love legumes!

Today the availability of the different types of legumes is increasing due to improvements in accessibility, exporting and importing, production of product varieties and convenience, with prepared and canned legume products readily available.

REFLECT ON LEARNING

1 Compare and contrast the significant differences between legumes, nuts and seeds.

2 State the dietary recommendations for legumes, nuts and seeds.

3 Legumes, nuts and seeds are all incomplete sources of protein. Define and explain incomplete protein. Name the legume that is the exception to this rule.

4 Discuss the importance of resistant starch in your everyday diet.

5 Suggest two ways to increase dietary fibre in your daily diet.

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Legume	Origin	Description	Cooking uses	Did you know?
Black-eyed peas 	Native to Africa and Asia.	White in colour with a black eye, these small-sized beans have a smooth texture and mild bean taste.	Casseroles, salads, soups	Black-eyed peas feature in South American and Jamaican 'soul food' cooking, travelling to the New World via the slave trade.
Cannellini beans 	Native to South America.	Pale white in colour and a medium size, these beans have a mild, nutty flavour.	Italian dishes, salads, soups, French cassoulet	These beans were first cultivated by the Incas and are very important to Italian cuisine. They are a great substitute for haricot or white kidney beans in recipes.
Lentils 	It is believed that lentils probably originated in Europe and Asia but, as they have been used since prehistoric times, it is hard to confirm.	Small and disc-like in appearance, these can be green, brown, red or yellow in colour.	Casseroles, dhal, pâtés, soups	A Hindu proverb says 'Rice is good, but lentils are my life.' The red lentil is the oldest of the lentil family. Lentils have fed us for thousands of years and in some areas are as important in today's diet as they were in earlier times. Unlike other legumes, lentils do not need to be pre-soaked before cooking.
Red kidney beans 	Native to the Americas.	A medium-sized bean with a smooth, mealy texture and a bright, rich red colour.	Casseroles, chilli con carne, salads, soups, stews	Cultivated by the Aztecs, these are among the most widely used legumes. They can cause food poisoning if they are not boiled for long enough before cooking.
Soybeans 	Native to Asia.	A small, smooth and creamy white coloured round bean that has a bland sweet flavour.	Casseroles, pâtés, fritters, tofu	Considered to be one of the 'five ancient grains' of China, the soybean has been grown for food in that country for over 2000 years.
Split peas 	Thought to have first originated in India.	A small round disc either yellow or green in colour; these are a variety of garden pea that has been peeled and split in half.	Casseroles, dhal, soups	Split peas have been found in archaeological sites dating back 2000 years. When choosing split peas, look for a strong colour.

Figure 9.10 Popular legumes

9.10 ACTIVITY

Left-out legumes

Figure 9.10 is not a comprehensive list of legume products.

1. List any legumes that are not listed in the table.
2. Add them to the table.
3. Research information so that you can fill in each column, reflecting the examples in the chart.
4. Prepare a meat-free meal using one of the listed legumes.
5. Design a recipe card to promote your meat-free meal.

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9.5 Cooking with legumes

Preparing legumes

Dried legume products such as beans and chickpeas need to be rehydrated before they can be used for cooking. Legumes should be soaked at room temperature in water for six to eight hours, or overnight, to improve their digestibility. This also reduces their cooking time when you are ready to cook them. Alternatively, you can use the 'quick boil' method – cover them in water and bring to the boil for two minutes. Then cover and leave to soak for an hour. Your legumes are now ready for cooking.

Cooking tip: try not to over-stir them while cooking, as this can often make them start to fall apart. You can also buy canned legumes that are ready for use immediately.

Check out chickpeas

The chickpea, also known as the Garbanzo bean, has a nutty flavour and has been grown throughout history in India. Chickpeas are ranked the 10th most consumed product in the world and are a popular ingredient in Spanish, Italian, Greek, Middle Eastern and Indian cuisines. They are a very versatile product, often found in salads, curry dishes, stews and dips, or just eaten roasted. Chickpeas got their name because it was thought that the shape resembled a chicken's beak. There are two types of chickpeas, the Desi of Indian origin and the Kabuli from the Middle Eastern and Mediterranean regions. Both varieties are grown in Australia. They are extremely versatile and can be milled into flour, known as besan flour, used predominantly in Indian cooking. They can be roasted and eaten plain, and they also come dried or canned ready to use.

Tasty Trivia

Do you have the correct legumes in your cupboard for your recipe? If not, it is not a problem. In most cases, you can substitute with another legume type and cook your recipe.

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Chickpea meringue nests

RECIPE

Main tools and equipment

Measuring spoons, measuring cup, electric beater, medium bowl, baking tray, baking paper

Production skills

Beating

Cooking processes

Baking

MAKES 2 NESTS

Preparation time: 20 minutes

Cooking time: 1.5 hours

Serving and presentation time: 10 minutes

Total time: 2 hours

Ingredients

					
200 g canned chickpeas (retain the liquid)	⅓ cup liquid from drained chickpeas	¼ teaspoon Cream of Tartar	¼ teaspoon white vinegar	½ cup icing sugar, sifted	½ teaspoon vanilla

Filling ingredients

		
¼ cup cream	1 teaspoon icing sugar	50 g raspberries or mixed berries

Method

1. Preheat oven to 120°C.
2. Line a baking tray with baking paper.
3. Drain chickpeas and reserve the liquid.
4. Beat chickpeas with electric beater until the mixture is white and foamy, forming soft peaks. This will take about 5 minutes.
5. Add cream of tartar and white vinegar. Beat until combined.
6. Gradually beat in icing sugar, a small amount at a time, until stiff and glossy peaks form.

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7 Beat in vanilla.
8 Spoon mixture onto baking paper, forming two meringue nests.
9 Use the back of a teaspoon to smooth the tops.
10 Bake meringues for 1.5 hours. Turn off oven and cool inside for 30 minutes.
11 Prepare the topping by beating the cream and sugar until a stiff peak is formed.
12 Wash and hull the berries.
13 To serve, spread the nests with the cream and decorate with the mixed berries.

Evaluating

1 This is a very unusual meringue. Describe why this is the case.
2 Describe the appearance, aroma, taste and texture of your finished meringue nests.
3 Outline how you could make this recipe suitable for a vegan.
4 Discuss the reason for cooking this product for such a long time and then cooling in the oven.
5 Describe the difference between soft peaks and stiff peaks.
6 Suggest two other topping ideas you could use if making this again.
7 Evaluate your skill level in completing this practical task.

DESIGN BRIEF: LEGUMES

Many people don't eat as many legumes as they should. Design your own affordable meal or snack using a legume product. It must serve two people and include at least five ingredients, including one vegetable or fruit. The final presentation of your dish must be visually appealing for your consumer and enhance the properties of your dish. Include the following design process steps when completing this brief:

1 Outline reasons why legumes do not appear in the everyday diet of many Australians as often as they are recommended.
2 Generate ideas to help you solve this brief.
3 Plan your production, including preparing a production plan.
4 Take a food-styled photograph of your final product to be displayed in your classroom to promote the consumption of legumes.

REFLECT ON LEARNING

1 Name your favourite legume. Explain your choice.
2 List five different types of legumes.
3 Draw a flow chart explaining the steps you need to follow to prepare legumes for cooking. Explain the reasons for each step.
4 You have a tin of red kidney beans in your pantry cupboard. Describe how you could incorporate these into tonight's dinner.
5 Discuss why legumes are often called a 'super food'.

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9.6 Nutritious nuts

Nuts are a versatile food commodity. There are many different varieties of nuts to choose from and they can be eaten raw or cooked into a number of different food products, including both sweet and savoury. Nuts can be purchased whole, roasted, salted, flaked, blanched, slivered and ground.

Tasty Trivia

Technically, the peanut is a legume but it is usually grouped in the nut category because it shares many physical and chemical properties with nuts.

Almond 	A flat-shaped nut with a pointy end and a smooth texture; creamy white colour covered with a brown skin.	Used in both savoury and sweet dishes, such as stir-fries, cakes, pastries, biscuits, confectionery and ice-cream.	Ground almonds are the main ingredient in marzipan. Half the world's almond supply is grown in California. They were cultivated as early as the second century BCE. Sugar almonds are a traditional food for births and wedding celebrations.
Brazil 	Long, three-sided creamy-coloured nut with a dark brown skin.	Great for desserts or on cheese platters, cakes, biscuits, confectionery and pastries.	Very high fat content. Brazil nut oil is often used in salad dressing. The world's supply of Brazil nuts is still gathered from wild trees, mostly located in the Amazon. Nuts have been known to kill or badly injure people when they fall off the tree.
Chestnut 	Large and round with brown flesh; they have a point at one end and a brown skin.	Sold roasted and puréed, used in savoury and sweet dishes.	This is the only nut that can be treated like a vegetable because it has more starch and a small amount of oil. Chestnuts are often roasted and sold on the streets during winter around the world.
Coconut 	Crunchy, white flesh and clear milk, encased in a brown fibrous husk.	Used in curries, for coconut cream and milk, cakes, biscuits, desserts and ice-cream.	Contains milk that is a refreshing drink and an important ingredient in Asian curries. Very high in fat – 87 per cent saturated.
Hazelnut 	Small, round, light-brown nut with a point at one end; it has a thin brown skin.	Great snack food; used in cakes, biscuits, stuffing, pastry, desserts, confectionery and ice-cream.	Mainly monounsaturated oil and a good source of vitamin E. 'Hazel' comes from the Anglo-Saxon word meaning 'hood' or 'bonnet'.
Macadamia 	White, smooth round nut.	Used in desserts, savoury dishes such as pasta, confectionery and ice-cream; also manufactured into macadamia oil and butter.	Excellent source of fibre. Native to Australia and an important food for Aboriginal and Torres Strait Islander peoples. A popular chocolate-coated treat.
Peanut 	Long pod-like nut with two to three seeds (the edible part), which are covered by a reddish, brown skin.	Great snack, used for savoury and sweet foods such as peanut butter, salads, satay, confectionery, desserts and ice-cream.	Not a real nut; actually a legume. Found in tombs dating back to 950 BCE.

Figure 9.11 Popular nuts

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Nut	Description	Cooking uses	Did you know?
Pecan 	Long, flat nut with a ridge running lengthways down the middle, covered in a thin brown skin.	Desserts, confectionery, cakes, biscuits, pastry and ice-cream.	Main ingredient of pecan pie. Unlike most nuts, these are low in fibre. Used by astronauts while in space because they are a concentrated energy source. Often confused with the walnut, as it looks similar, only flatter. Pecan shells are used for chicken litter.
Pistachio 	A small, green kernel covered in a thin red-coloured skin; usually comes in its shell.	Pâté, terrines, accompaniment to meats, desserts, pastries, confectionery and ice-cream.	An excellent source of iron.
Walnut 	This creamy brown, round nut has two joined hemispheres that resemble a butterfly; it has a light brown, thin skin.	Used in stuffing, biscuits, salads and salad dressing, pastry and confectionery.	Many people say this nut looks like a human brain. Can you see any resemblance? There are 15 different types of walnuts growing around the world.

Figure 9.11 Popular nuts (continued)

9.11 ACTIVITY

Nut recipes

Using the list of nuts from Figure 9.11, find a recipe for each nut listed. Then answer the following questions:

1. How many of the listed nuts have you eaten before?
2. Identify which nut was the easiest one for which to find a recipe. Suggest why this was so.
3. Identify which nut was the most difficult one for which to find a recipe.
4. Discuss whether you have ever produced or consumed any of these recipes before.
5. How many of the recipes have you never tried? List each new recipe.
6. Which recipe would you be most keen to cook in class? Explain why.

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Peanut butter

RECIPE

Main tools and equipment

Tea towel, measuring spoons, food processor, sterilised jar

Production skills

Shelling, blending

Ingredients

 250 g unsalted peanuts, shelled, roasted	 2 tablespoons peanut oil or polyunsaturated oil	 ¼ teaspoon salt, to taste

Method

1. Rub the skins off the peanuts.
2. Put peanuts in food processor and process until ground.
3. Gradually add oil and process until oil is absorbed and a paste is formed.
4. Add salt to taste and store in a sterilised jar.

Recipe tip: You can make a crunchy or smooth peanut butter. This recipe is for crunchy peanut butter. For a smooth peanut butter, put half the peanuts and half the oil in the processor and blend until smooth. Then gradually add the remaining peanuts and oil until you have a smooth paste.

Evaluating

Compare your peanut butter with a commercial variety using a table like this.

Describe the …	Homemade peanut butter	Commercial peanut butter
Appearance		
Aroma		
Taste		
Texture		

SERVES 2

Preparation time: 15 minutes

Serving and presentation time: 5 minutes

Total time: 20 minutes

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1 Which peanut butter did you prefer? Explain why.
2 Work out how much it cost to make your homemade peanut butter. Use the Coles Online website to help you work out the cost of the ingredients.
3 Compare this with the cost of the commercial peanut butter.
4 Which peanut butter represents better value?
5 Overall, discuss which peanut butter is best and explain why, with reference to cost and sensory properties.

Figure 9.12 Nuts can be used whole, slivered or crushed when cooking.

Tasty Trivia

Peanut butter has been traced to the Aztecs and the Incas – two ancient civilisations that lived in the area that we today know as South America.

9.12 ACTIVITY

Cooking with nuts

Roasting nuts really brings out their flavour – try it for yourself!

1 Preheat your oven to 300°C and spread the nuts out on a baking tray in a single layer. Roast for 10–15 minutes. Watch them closely as they can burn quickly due to their high fat content.
2 Compare the flavour between a raw nut and roasted nut.
3 Describe which tasting you preferred: the raw or cooked nut.
4 Describe the physical and sensory changes that occur once the nut has been cooked.
3 Investigate alternative methods available to cook nuts.

Check out cashews

9.13 ACTIVITY

Cashew conversation

Investigate the cashew nut and copy and complete the chart below, in a similar way to Figure 9.11 on pp.242–3. Research up to five facts for the last column.

Nut	Description	Cooking uses	Did you know?
Cashew			

ISBN 978-1-316-64912-1

Chicken and cashew nut stir-fry

CHINA

RECIPE

Main tools and equipment

Vegetable knife, measuring spoons, measuring cup, measuring jug, chopping board, frying pan, wooden spoon

Production skills

Slicing, measuring

Cooking processes

Stir-frying

SERVES 2

Preparation time: 10 minutes

Cooking time: 15 minutes

Serving and presentation time: 5 minutes

Total time: 30 minutes

Ingredients

1 teaspoon cornflour	1 chicken stock cube	¼ cup water	1 tablespoon soy sauce	1 tablespoon oyster sauce	2 teaspoons peanut oil
1 chicken fillet, thinly sliced	½ brown onion, sliced	1 clove garlic, crushed			
2 spring onions, thinly sliced	1 carrot, thinly sliced	½ red capsicum, sliced			
80 g Chinese broccoli, chopped	6 snow peas, sliced	1 bok choy, quartered			
1 teaspoon coriander, chopped	¼ cup (35 g) unsalted roasted cashew nuts	Small handful bean sprouts (garnish)			

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Method

1. Prepare all ingredients, starting with the vegetables and finishing with the chicken.
2. Combine cornflour, chicken stock cube, water, soy sauce and oyster sauce. Set aside.
3. Heat oil in a frying pan or wok.
4. Add chicken and stir-fry until cooked.
5. Remove chicken from pan.
6. Fry onion until transparent, then add all other vegetables and cook until just softened.
7. Add chicken, cashew nuts, coriander and sauces to the pan. Stir until the mixture boils and thickens slightly.
8. Garnish with bean sprouts and serve.

Evaluating

1. Identify the processes used to produce the Chicken and Cashew Nut Stir-Fry.
2. List five other vegetable ingredients you could use in this stir-fry to create a colourful, fresh and nutritious meal.
3. Outline three safety rules you had to consider when producing this recipe.
4. Describe the role of the cashew nuts in this recipe.
5. If you wanted to serve more people with this recipe, but didn't want to double the ingredients, what could you serve this with?
6. Describe the appearance, aroma, taste and texture of your stir-fry using sensory analysis language. Write a complete sentence for each one.
7. Describe what you learned from making this recipe.
8. If you made this recipe again, what would you do differently? Explain why.

Successful stir-frying

Stir-frying is a simple and quick technique to make tasty food fast. Have everything prepared before you start so that when it is time to cook you can stay with your food at all times. Always keep the ingredients moving by tossing them in your pan. This ensures everything cooks evenly.

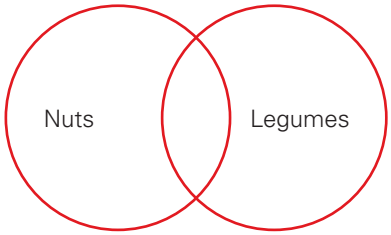
If cooking large quantities, cook your meat in batches. This helps it to brown and cook quickly. If you have too much in the pan at once, the meat will start to 'stew' in its own juices.

When stir-frying vegetables, it is best to start with those that take the longest to cook, like onion, carrot and broccoli; this way, your other vegetables won't over-cook and end up soft. A good vegetable stir-fry still has a crunch when you eat it.

Figure 9.13 Stir-fry should have a crunch to it.

REFLECT ON LEARNING

1. Copy and complete the Venn diagram by comparing and contrasting nuts and legumes.



2. Describe the reasons why nuts might be cooked.
3. List the different ways nuts can be purchased.
4. Identify the nutrients found in nuts. Explain why they are important for good health but should only be eaten in small amounts.
5. Stir-frying is a popular cooking method. Suggest three reasons why this is so.

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9.7 Sensational seeds

Seeds may look small and not very exciting, but they are packed with vitamins and minerals. They are used in a range of savoury and sweet dishes, and add colour, flavour and texture to your favourite dish.

9.14 LET'S COLLABORATE

With a partner, list all the food products you can think of that use seeds, either in the recipe or as a garnish – for example, poppy seeds on bread products.

Check out wattle seeds

You probably have seen the well-known Australian emblem, wattle, around your area blossoming in spring. The Acacia (wattle) not only has a very pretty flower, but its seed has been included in the diet of Aboriginal and Torres Strait Islander peoples for thousands of years. Wattle seed has long been a rich source of protein and carbohydrate, especially during drought times. Wattle seed is becoming popular in cooking due to its nutty, mild, coffee-like flavour. Wattle seeds are added to damper and muffins, and ground and used to thicken salad dressings, sauces and casseroles. The seed can be crushed into a flour and has even been used in dessert dishes.

Wattle seed contains calcium, iron, zinc and potassium in fairly high concentrations. Due to its low glycaemic index and being high in fibre, wattle seed is also very good for diabetics.

Be careful, as there are only a small number of edible wattle seed types, so don't gather your own! Wattle seed is an ingredient that needs to be purchased commercially for human consumption.

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Seed	Description	Cooking uses	Did you know?
Caraway 	Small, thin, brown black, crescent-shaped seed with a very strong and aromatic fragrance.	Seed cakes, Hungarian goulash, salads and served with vegetables; also added to cheese in Europe.	Aid the digestion of food. Used in love potions by the ancient Greeks and Egyptians to prevent your loved one from straying. Also served with baked apples in England to prevent flatulence.
Pumpkin 	Flat, oval-shaped green kernel encased in a creamy white shell.	Snack bars, salads, cakes, slices, biscuits and sprinkled in soups and casseroles.	High in protein, iron and vitamin C. Popular, healthy snack food. Dry your own using your microwave or direct sunlight.
Sesame 	Very small, flat cream-coloured seed.	Toasted and added to salad, meatloaf, casseroles, quiche and stuffing; also sprinkled on breads and made into a paste (tahini) and oil.	One of the oldest and most nourishing seeds, dating back to 1600 BCE. Contains a large amount of oil.
Sunflower 	Beige-coloured, small, flat, oval-shaped seed.	Popular in breads, added to salads (often roasted), cakes, biscuits and puddings.	Good source of iron, zinc and vitamin C.
Poppy seeds 	Very tiny, round, grey seed.	Commonly used on breads and dry biscuits, as well as cakes, pastries and strudels; can be ground and used to thicken curries.	Source of calcium.

Figure 9.14 Popular seeds

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Wattle seed and bush tomato risotto

AUSTRALIA

RECIPE

Main tools and equipment

Measuring cups, measuring spoons, measuring jug, chef's knife, chopping board, wooden spoon, saucepan

Production skills

Measuring, dicing

Cooking processes

Sautéing, simmering

SERVES 2

Preparation time: 10 minutes

Cooking time: 30–35 minutes

Total time: 40–45 minutes

Ingredients

 1 teaspoon oil	 1 clove garlic, crushed	 ½ brown onion, diced	 ½ cup Arborio rice
 2 cups vegetable stock	 ½ teaspoon ground wattle seed	 ½ tablespoon ground bush tomato	¼ diced tomato as garnish
 5 basil leaves, shredded	 1 teaspoon cream	 20 g parmesan, shaved	

Method

1. Place the oil into a saucepan and heat. Add the onion and garlic and sauté until translucent.
2. Place saucepan onto a low heat. Add the rice and stir for a couple of minutes to seal the rice.
3. Add the vegetable stock, a quarter at a time. The rice should always be covered by liquid. Stir well after each amount of liquid.

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4 When half your stock has been added, add your wattle seed and bush tomato. Stir well. Continue adding your stock.

5 Cook until rice is just tender or *al dente*. Add cream, diced tomato and basil leaves, mixing well.

6 Remove from heat and garnish with parmesan cheese before serving.

Evaluating

1 List five other ingredients that could be included in your risotto.

2 Describe the flavours of the bush tomato and wattle seed.

3 Suggest an alternative ingredient you could use if you are unable to get bush tomato for this recipe.

4 Explain how you were able to tell when your rice was cooked.

5 Outline what you should do with any leftover risotto.

Quick ideas for seeds

1 Sprinkle over your breads, cakes and biscuits before cooking them.
2 Combine with your muesli or chopped up with fruit in your yoghurt for a great breakfast to start off your day.
3 Add a spoonful to your pasta, rice, hamburgers and casserole dishes. Sprinkle over your salad.
4 Add to your stir-fries, sprinkle over food after cooking for a nutritious, colourful and tasty garnish.

Figure 9.15 Pumpkin seeds are versatile as well as being incredibly nutritious.

9.15 ACTIVITY

Investigating legumes, nuts and seeds

1 Go back to Activity 9.1 on p.227. Fill in the last column, identifying which legume, nut or seed is featured in this food product.

2 Have you tried any new foods since filling out this chart? Go back and use a different-coloured pen to check off the food products listed that you have now tried.

3 Add any new legumes, nuts and seeds to your chart that you may have studied but that have not been included. An example is wattle seed.

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REFLECT ON LEARNING

1. Research and then describe how poppy seeds are used in Indian cooking.
2. Identify the main nutrient provided by wattle seeds.
3. Explain how you might use pumpkin seeds.
4. Outline the benefits of including seeds in your diet.
5. Provide two tips for incorporating seeds into your diet.

9.16 ACTIVITY

Fact or fiction?

1. Pick five different food items from this chapter.
2. For each one, list three factual statements and one that is fiction.
3. Play 'fact or fiction' with the class. Everyone has to guess which one of your statements is fiction. Here is an example for the caraway seed:
   - **a** The caraway seed is often found in sweet treats such as cakes.
   - **b** In England, the caraway seed was served with baked apples to prevent flatulence.
   - **c** The caraway seed was so named because it was first discovered being eaten by caraway birds.
   - **d** The caraway seed has a long association with love, being used in ancient love potions.

   (Answer: Fiction – statement c.)

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LOOKING BACK

1 Legumes are the seeds from some pod-bearing plants – for example, chickpeas, lentils and red kidney beans; pulses are dried legumes. They are a good source of protein and are high in carbohydrate, fibre, folate and iron, and low in fat. Legumes are available dried or canned, and also already prepared.

2 Nuts are an edible kernel in a hard shell, such as hazelnuts, macadamia nuts and cashew nuts. They are a source of 'good' fat, and must be stored correctly so that they do not become rancid, due to their fat content. There are many different types of nuts, which can be purchased whole, roasted, salted, flaked, blanched, slivered and ground.

3 Seeds are dried from the flowers or fruits of plants, such as poppy, sesame, pumpkin and sunflower.

TEST YOUR KNOWLEDGE

Multiple choice

1 Legumes, nuts and seeds are:
   - **a** all high in fibre and low in fat
   - **b** all high in fat and low in fibre
   - **c** not very nutritious but taste great
   - **d** all a great source of fibre.

2 The best way to store nuts is:
   - **a** uncovered in the fridge
   - **b** covered in the pantry
   - **c** uncovered in the pantry
   - **d** covered on the bench.

True/false

1 Nuts are edible kernels in a hard shell.

2 Legumes must be cooked to improve their palatability.

3 Seeds can give food products colour and texture when used in cooking.

Short answer

1 Legumes are very high in dietary fibre and resistant starch. Explain why this is important for good health.

2 Legumes are a sustainable and affordable source of protein. Describe why this is so.

Extended response

As you have discovered, legumes are a highly nutritious and delicious food source, yet many people do not include them regularly in their diets. Design a daily menu that features legumes, nuts and seeds, and have a complete protein source for at least two meals. Don't forget some snack foods and drinks. Include the recipe for your evening meal. Use the table below to help you.

Breakfast	
Morning snack	
Lunch	
Afternoon snack	
Dinner	

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CHAPTER 10

Flavoursome: Fats and food flavourings

ACCESS PRIOR KNOWLEDGE

1. Explain the difference between 'good' fats and 'bad' fats.
2. Develop a list of reasons why extra virgin olive oil is better for you.
3. Draw a flow chart to show how to make your own butter in your school Home Economics room.
4. Is it possible for coriander to be both a herb and a spice? Explain your answer.
5. Discuss why sugar and salt are found in so many different food products.

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10.1 Starting with fats and oils

The word 'fat' is used commonly to describe both fats and oils, but in fact the correct term for this group is **lipids** because there are distinct differences between fats and oils. **Fats** are solid at room temperature and usually come from animal sources, whereas **oils** are usually liquid at room temperature and often come from plant sources (seeds and nuts). Lipids play a very important role in food as they contribute to flavour, texture and aroma. For example, the smooth creamy texture chocolate creates as it melts in your mouth is due to its lipid content.

lipids Substances that are insoluble in water, such as fat and oil.

fats Compounds, usually derived from an animal source, that are solid at room temperature and liquid when heated – for example, butter.

oils Compounds, often derived from a plant source – for example, nuts and seeds – that are liquid at room temperature.

Fats and oils provide a wonderful mouthfeel and flavour to food items. Imagine eating toast without butter!

History of fats and oils

People have been using the fat from animals in their food preparation and cooking since early hunting and gathering days, about 12 000 years ago. During this period in history, the men would hunt to kill wild animals while the women would gather nuts, fruits and grains for their staple food supply.

butter A dairy product that is produced by churning milk or cream until the fat solidifies and forms a spread.

Butter was discovered by accident. Milk was carried by travellers and was accidentally churned in its container during transport. As a result of the milk being sloshed around, the first butter was produced. The first margarine was developed by a French chemist in 1869, as there was a butter shortage and the French wanted a product they could give to their soldiers. Today, margarines are generally made from vegetable oils and are designed to be lower in cholesterol, soft and easy to spread straight from the fridge.

Butter was mostly a northern European food. Olive oil was more popular in Mediterranean countries like Greece and Italy. It is believed the cultivation of the olive began about 6000 years ago in the Mediterranean region. Olive oil became Greece's major export as far back as 3000 BCE.

Figure 10.1 Oils are liquid at room temperature.

Figure 10.2 Fats are solid at room temperature.

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Tasty Trivia

The ancient Irish and the Vikings used to flavour butter with garlic and other herbs, and bury barrels of it in the peat bogs. It would be left there for at least a year and sometimes they would plant a tree over the spot to help them remember where it was.

Figure 10.3 Butter separating from cream in a butter churn.

10.1 ACTIVITY

Make your own butter

Have you ever made your own butter? It is very simple – why not give it a try? Follow these steps and take pictures of each step as you go.

1. Pour 600 ml of unthickened cream into a bowl.
2. Beat with electric beaters. After some time, you will start to see the cream separate into butter and buttermilk. The butter will cling to the beaters.
3. You now need to 'pat' the butter together into a ball. Make sure all the buttermilk (the liquid from this process) has been carefully squeezed out or your butter will spoil more quickly.
4. You may like to add some salt to taste.
5. Complete a taste test, comparing your butter with a commercial variety and also with margarine.
6. Copy and complete the table below.

Describe the …	Homemade butter	Commercial butter	Margarine
Appearance			
Aroma			
Taste			
Texture			

a Identify which product you preferred. Explain why.

b Calculate how much it would cost to produce your homemade butter. Use the Coles Online website to help you work out the cost of the cream.

c Compare your answer with the cost of the commercial butter and margarine.

d Suggest which product represents the best value for money.

e Discuss which product is your preferred option and explain why, with reference to both cost and sensory properties.

f Annotate your pictures to create a digital image recipe flow chart.

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Figure 10.4 Most of us have only ever tasted commercially produced butter.

Tasty Trivia

Have you ever eaten bad fish and chips or been to a fish and chip shop that stinks of old fat? This is rancidity, which is when fats and oils react with oxygen to become rancid or go off, producing an unpleasant odour and flavour.

Tasty Trivia

The word 'butter' originates from the Greek word 'cow cheese'.

CREATE A SOLUTION

After making butter, you are also left with homemade buttermilk. Your family is trying to live more sustainably, so rather than throw away your buttermilk, find a way to use it.

1. Conduct a sensory analysis of the buttermilk to investigate its sensory and physical properties.
2. Generate ideas for how you could preserve your buttermilk to use in the future, reducing waste of this food item.
3. Generate some recipe ideas that will ensure you are able to provide a solution to the brief.
4. Evaluate your product to determine whether you have created a successful design solution.
5. Suggest why buttermilk is used in many baked products.
6. Reflect on the project-management processes that you have employed throughout this design process. Provide some information on areas where you went well as well as those where you would like to do something differently when working through the process again. Also list two skills you learnt or developed when completing this design task.

REFLECT ON LEARNING

1. Identify the sources of most fats.
2. List the sources of most oils.
3. Explain why lipids play an important role in food production.
4. Identify who invented margarine and the reason for designing this food product.
5. Complete the comparison alley below comparing butter and margarine.

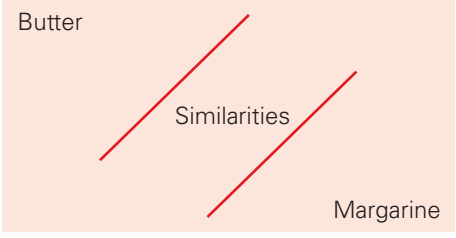

Figure 10.5 Comparing butter and margarine.

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Structure and classification of fats and oils

essential fatty acids (EFA) 'Good' fats; the body does not produce these, so they must be consumed from food. Examples of foods that supply EFA are nuts, avocado and fish.

saturated fats 'Bad' fats that clog our arteries, such as those found in animal products like full-fat dairy items and fatty meat, as well as some plant-based sources.

unsaturated fats 'Good' fats that can help to reduce cholesterol levels. They are divided into monounsaturated fats and polyunsaturated fats.

Fatty acids are found in oils and fats. Some fatty acids can be made by the body but others are only available from foods. These are known as **essential fatty acids (EFA)**. Lipids may be **saturated** or **unsaturated** depending on their chemical structure. There are four main types of fats: saturated, monounsaturated, trans and polyunsaturated. Each type is determined by the chemical bond between the atoms.

Monounsaturated fats

Monounsaturated fats are considered a 'good' fat, as they tend to lower cholesterol levels. They should be used to replace saturated fats in your diet, reducing the risk of heart disease.

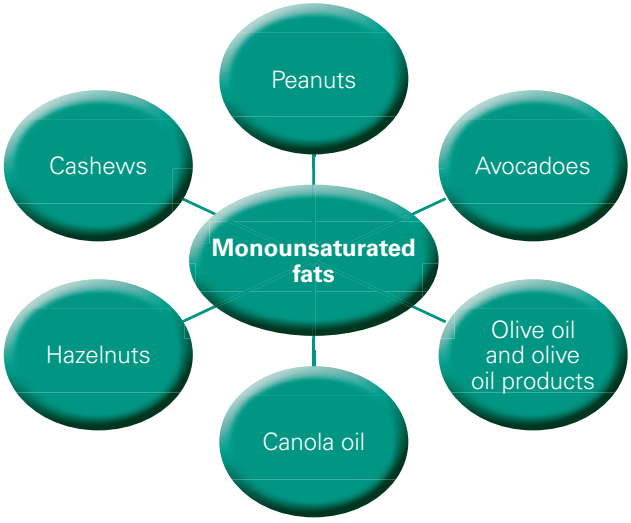

Figure 10.6 Sources of monounsaturated fats

Figure 10.7 Some examples of food sources of monounsaturated fats.

Polyunsaturated fats

Like monounsaturated fat, polyunsaturated fat is also considered a 'good' fat because of the benefit of replacing saturated fats with this type of fat. Polyunsaturated fats are found in plant and fish products. These fats contain omega-3 and omega-6, which have many health benefits, including lowering blood cholesterol, reducing blood pressure and reducing the risk of heart disease and strokes.

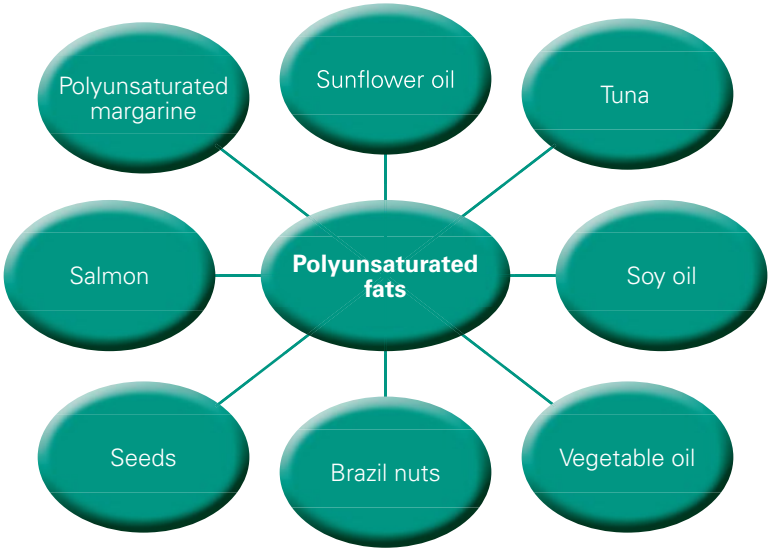

Figure 10.8 Sources of polyunsaturated fats

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Figure 10.9 Some examples of food sources of polyunsaturated fats

Saturated fats

Saturated fats are found in all animal products and a few vegetable products. They are generally solid at room temperature and contribute to the risk of heart disease by increasing blood **cholesterol** levels. It is recommended that we replace saturated fats with monounsaturated and polyunsaturated fats for better health.

cholesterol A waxy, fat-like substance used by the body to build cell walls. It is either produced in the liver or absorbed from animal fats eaten. It is necessary for good health; however, excess levels are detrimental.

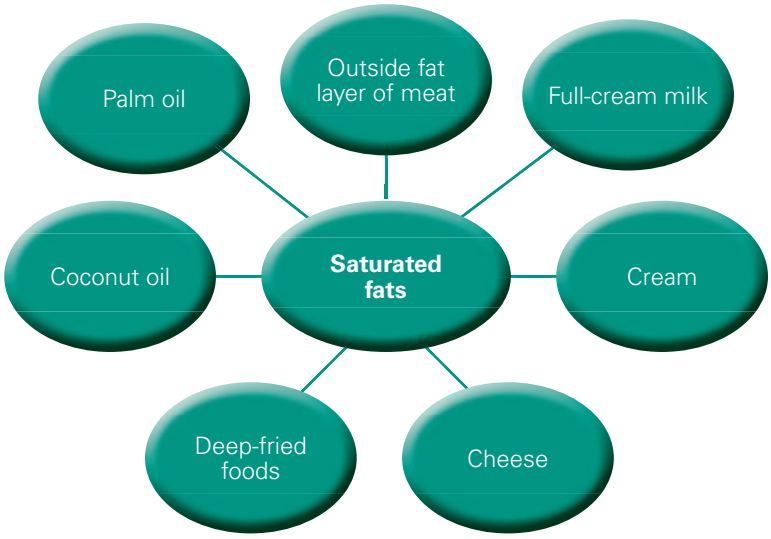

Figure 10.10 Sources of saturated fats

Figure 10.11 Some examples of food sources of saturated fats

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Trans fats

Trans fats, otherwise known as hydrogenated vegetable oils, are much like saturated fats, raising cholesterol levels and increasing the risk of heart disease. Small amounts of trans fats are found naturally in food, but most are created when liquid oil is changed into a solid fat. They are often referred to as 'ugly fats' because their impact on health is worse than that of saturated fats. These fats are mostly used in the food industry, as they are cheap to buy and have a long shelf life.

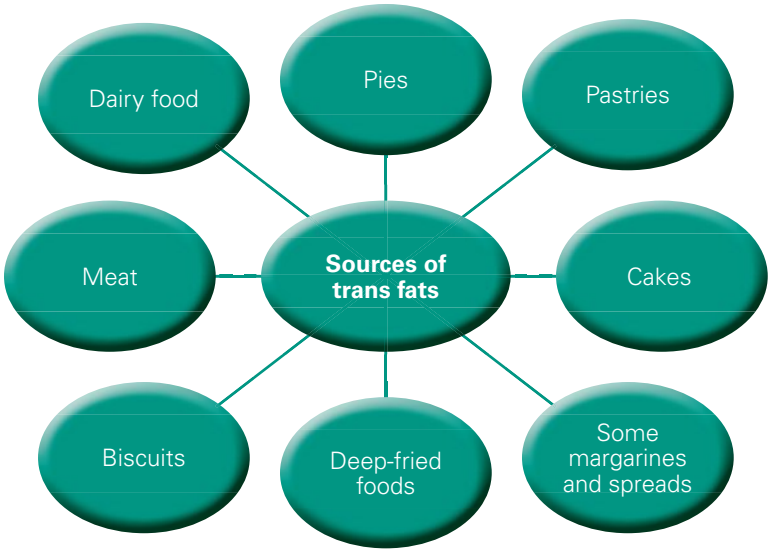

Figure 10.12 Sources of trans fats

Figure 10.13 Some examples of food sources of trans fats

10.2 LET'S COLLABORATE

The World Health Organisation has called for a ban on trans fats being used in food production globally. Suggest why it would do this. Discuss as a class.

10.3 LET'S COLLABORATE

So many of the foods we eat contain fat. List the different sources of fat in our diet. Suggest some alternative products that could be eaten instead. How many ways can you think of to reduce the amount of saturated fat in your everyday diet? Collate the responses as a class.

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Lipid	Source/origin	Uses in cooking	Did you know?
Almond oil (monounsaturated) 	Plant: almond	Salad oil and baking	Almond oil is used more as a moisturiser for the body than for cooking. The ancient Egyptians used it to prevent wrinkles.
Butter (saturated) 	Animal: cow	Spread, frying, cake making and baking	It is a regulation that butter contain no less than 80 per cent milk fat. It is an excellent source of vitamin A.
Coconut oil (saturated) 	Plant: coconut	Used for confectionery, margarine, ice-cream and cooking oil	This is one of the few plant oils that is a saturated fat. Also used as a nourishing hair oil, and to make soaps and cosmetics like lip gloss.
Ghee (saturated) 	Animal: cow	Frying	Ghee is 'clarified butter', which is butter with the milk solids and salt removed. Ghee can be heated to higher temperatures than butter without burning. Ghee is of particular importance to Indian cooking because of the flavour it creates and the high temperature it can reach.
Lard (saturated) 	Animal: pig	Pastries, frying and roasting	Use lard sparingly as it is almost 100 per cent fat! Lard is the clean white fat rendered from pigs, used by humans since early hunting days. It is great for cooking as it is able to heat to high temperatures and produce a crispy final product.
Margarine (monounsaturated) 	Plant: vegetables	Spreads and baking	Margarine is an emulsion that has been hydrogenated to make it solid. Colour, salt, milk, flavour and antioxidants are all added to margarine.
Olive oil (monounsaturated) 	Plant: olives	Salad dressing and cooking oil	Excellent source of vitamin E which, in connection with monounsaturated lipids, reduces the incidence of heart disease. The largest producers of olive oil today are Italy and Spain.
Peanut oil (monounsaturated) 	Plant: peanut	Used in cooking, stir-frying, mayonnaise, margarine and salad dressings	Peanut oil was used as the original fuel source for the diesel engine.

Figure 10.14 Popular lipids

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Lipid	Source/origin	Uses in cooking	Did you know?
Shortening (saturated and monounsaturated) 	Mixture of fats, both animal and plant	Deep frying, baking and pastry making	In Australia, shortening is 100 per cent fat. It is mostly produced for the food industry and is not readily available to the average consumer.
Suet (saturated) 	Animal	Pastry and puddings	Purchased from the butchers, it is an ingredient of a traditional Christmas pudding.
Sunflower oil (polyunsaturated) 	Plant: sunflower	Cooking, salad dressings, margarine and shortening	Richest oilseed source of vitamin E. Believed to have originated in Mexico; today the major producing countries are Russia, the United States and Argentina.
Vegetable oil (mix of polyunsaturated and monounsaturated) 	Plant: blended	General cooking and salad oils	Now more commonly used instead of animal fats for health reasons.
Duck fat 	Animal: duck	Roasting, **confit**, commonly used in French cooking	Unlike butter, duck fat can be kept and reused when cooking. The smoke point of duck fat is higher than that of butter and many oils, so it can be heated to higher temperatures.

confit Different foods that have been cooked in oil or syrup, then sealed and stored.

Figure 10.14 Popular lipids (continued)

CREATE A SOLUTION

Your pantry is full of jars of different oils. It is time to unclutter the pantry cupboard and use some of the leftover oil before it reaches its best-before date.

1. Investigate the range of oils available. Choose a variety of oils that you have not worked with before to compile a list.
2. Research different recipes that include these oils as a key ingredient.
3. Suggest why these oils are used rather than other available varieties.
4. Generate a list of different recipes that you could prepare in class. Choose a recipe and justify your choice.
5. In preparation for your production, list five safety considerations you will need to follow. Explain the reasons for these practices and discuss how you will manage safety issues.
6. Produce this recipe in class and share with your class colleagues.
7. Explain the purpose of the oil in this recipe and reflect on whether the oil used could be substituted with a different variety. Explain your reasons.

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REFLECT ON LEARNING

1. List the main food sources of saturated fats.
2. List two main sources of monounsaturated fats.
3. Explain the benefits of consuming polyunsaturated fats.
4. Identify which countries are the largest producers of olive oils.
5. Use a three-circle Venn diagram to identify and compare the differences and similarities between the three types of lipids.

Tasty Trivia

Fat is a key ingredient in sausage making. You can use any fat, but pork is the most popular. Usually between a quarter and half of the volume is fat to ensure the sausage isn't dry. If the texture is grainy, there isn't enough fat. Sausages can easily be made at home – have a go yourself!

10.2 Nutrition and chemical properties of fats and oils

Fats and oils provide more **kilojoules** per gram than any other food. It is important that we monitor our intake of fats and oils so as not to consume more energy than our bodies need. We require only about 20 g of fat every day – that's just one tablespoon. Some fats are better for your body than others. These are often referred to as 'good' fats because of their benefits for health. The saturated fats are referred to as the 'bad' fats because of the negative impact these have on health. The 'good' fats are both the monounsaturated and polyunsaturated fats. We need to include fats – particularly monounsaturated and polyunsaturated fats – in our diet as they are the source of **fat-soluble vitamins** (A, D, E and K). Fat is also a major energy source.

kilojoule Unit used to express the energy or fuel value of food.

The major sources of fat in the Australian diet include:

- spreads – butter and margarine
- meat and meat products
- dairy products – full-cream milk and milk products
- chocolate
- takeaway and snack foods, especially fried foods
- cakes, pastries and biscuits.

fat-soluble vitamins Vitamins (A, D, E and K) that are not soluble in water and that need to be stored in the body in either the liver or fatty tissues. They are transported around the body by special proteins.

10.4 INVESTIGATE IT

Statistics from the Australian Institute of Health and Welfare show that Australians are consuming far too much fat. Research how best to reduce your fat intake in everyday eating and design a video or podcast to promote these changes.

Food of the gods

One of the meanings of the word 'chocolate' is 'food of the gods'. It is believed that chocolate originated in the Amazon more than 4000 years ago. Australians are certainly eating their fair share of chocolate, with each person consuming an average of 5 kg of chocolate per year. It is a $75 billion a year industry in Australia. Chocolate started off as currency – it was the ancient Aztec coin. It is the fat in the cocoa butter that gives chocolate its 'melt-in-the-mouth' texture.

REFLECT ON LEARNING

1. Identify the amount of fat required daily. Discuss whether Australians are consuming more, less or the correct amount of fat. Justify your response.
2. Explain why it is important to monitor our intake of fats and oils.
3. Name the fat-soluble vitamins.
4. List five major sources of fats and oils in the Australian diet.
5. Describe what gives chocolate its melt-in-the-mouth texture.

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Check out olive oil

Olive oil has increased in popularity in Australia over the last 10 years or so, although it has been popular within Mediterranean countries for many years – figures from the European Union found that in Greece people are consuming nearly 18 kg of olive oil per year! You may have noticed the many different types of olive oils available. The flavour of olive oil can depend on where the olives are grown. Most olive oil is produced in Italy or Spain, although we are producing **boutique** olive oil in Australia, and many Australians are choosing to purchase our local produce.

boutique Describes a very specialised product that is usually produced in small quantities.

To make the oil, the olives are washed then pressed into a paste. The oil and water are separated out. From here, the oil is graded into three categories: extra virgin, virgin and pure olive oil.

10.5 INVESTIGATE IT

Conduct an investigation to find out whether any oils are produced in the region where you live.

Figure 10.15 Olive oils come in different varieties.

Extra virgin olive oil

Considered the best of the olive oils, this oil has the strongest flavour as it comes from the first pressing of the olives and has only 1 per cent acidity. This type of oil contains the most beneficial nutrients and **antioxidants**, but is also the most expensive. This oil is not usually used for cooking as the heat alters the taste. It is best used in salad dressings or served with bread as a healthy alternative to butter. If you must use this oil for cooking, mix with equal quantities of vegetable oil to give it a better taste.

antioxidant A substance, such as vitamin C or E, thought to help fight free radicals in the body that can cause disease.

Virgin olive oil

This is the oil produced from the second pressing. It can be used in much the same way as the extra virgin olive oil, although it can also be used for cooking (though not deep frying). It is often considered an ideal all-purpose oil but is a more expensive choice compared with its vegetable oil partners.

Pure olive oil

Pure olive oil is produced when the olives have had more than one pressing and undergoes some processing to remove any impurities. This oil has a lighter flavour than the virgin oils and is suitable for all types of cooking.

Light olive oil

This oil has gone through considerable processing to make it lighter in colour. The 'light' only refers to the colour and not the fat content. The flavour is also affected by the processing: this oil only has a light olive oil taste.

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10.6 ACTIVITY

Sensory analysis: Get tasting!

For this activity, you will need four small pieces of bread, one to taste each type of oil. Toast the bread before you start. This is the method used in Italy to assess oil quality. Copy and complete the table below, and then taste one olive oil at a time in order to fill in your results. You will also need to read the bottle labels to collect all the information required. Remember, you are tasting the oil, not the bread. After you have finished, complete the questions below.

Appearance	Aroma	Texture	Taste	Saturated fat per 100 ml	Total fat per 100 ml
Extra virgin olive oil					
Virgin olive oil					
Light olive oil					
Pure olive oil					
Olive oil that is produced in your region of Australia					

1 Identify the oil you liked the most. Explain your choice.
2 Identify the oil you liked the least. Explain your choice.
3 Compare the oils. Was there a difference between the oils? Explain your answer.
4 Suggest what the term 'light' means to you.
5 Explain what you think the term 'light' means to consumers.
6 Describe how light olive oil is 'lighter'.
7 Discuss whether labelling this oil as 'light' is misleading to consumers. Justify your opinion.

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Lemon myrtle and eucalyptus shortbread

RECIPE

Main tools and equipment

Sieve, measuring cups, measuring spoons, electric beater, baking tray

Production skills

Sifting, creaming, dough making, rolling, cutting, baking

MAKES 10 BISCUITS

Preparation time: 30 minutes

Cooking time: 30 minutes

Serving and presentation time: 5 minutes

Total time: 1 hour and 5 minutes

Ingredients

 1½ cups plain flour, sifted	 ¼ cup rice flour, sifted	 ½ teaspoon baking powder, sifted	
 ½ teaspoon ground lemon myrtle	 150 g salt-reduced butter	 ¼ cup caster sugar	 1 egg white
 200 g icing sugar	 1 teaspoon lemon juice	 ¼ teaspoon eucalyptus oil (for cooking)	

Method

1. Preheat oven to 160°C.
2. Combine sifted dry ingredients (plain flour, rice flour and baking powder) with lemon myrtle in a bowl.
3. Cream butter and sugar in a large bowl.
4. Stir in the flour mixture to form a soft dough. Cover with plastic wrap and rest in a cold place for 15 minutes.
5. Roll dough out onto a lightly floured surface to 3 mm thickness.
6. Cut into long fingers or triangles – you choose the shape for your biscuits!

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7 Place onto an oven tray sprayed with eucalyptus oil and bake for 30 minutes or until the shortbread is pale golden in colour.

8 Remove from tray and cool on a wire cake rack.

9 To make icing, beat the egg white until a soft peak is formed, fold in lemon juice and icing sugar and mix well.

10 When biscuits are cool, ice with your own designs.

Evaluating

1 Name and describe the processes used in this recipe.

2 List two health and safety rules you had to consider when producing this recipe.

3 Explain why extra virgin olive oil is used in this recipe.

4 Describe the appearance, aroma, taste and texture of your shortbread using sensory analysis language. Write a complete sentence for each.

5 Explain how you tested your shortbread to check it was cooked.

6 Suggest how you could modify this recipe.

7 If you made this recipe again, explain what you would do differently.

DESIGN BRIEF: AFTER-SCHOOL SNACKS

Nutritionists are encouraging all Australians to reduce their intake of saturated fats. One of the main sources of fat in our diet is in cakes and sweet treats, which many teenagers eat during the day or after school as a snack. Design a cake suitable for an after-school snack that includes a reduction in saturated and trans fats.

The carrot cake recipe on p.268 is included because it does not contain butter, a source of saturated fat. Suggest the ingredients containing 'good' fats that you may like to use or substitute for another ingredient in your cake recipe. Investigate the ingredients you may want to use in your cake.

Ethical issue: Say no to palm oil

Palm oil is an edible vegetable oil that is derived from the palm fruit. Palm oil is grown throughout Africa, Asia, North America and South America. Some 85% of the palm oil produced is exported from Indonesia and Malaysia. The palm oil industry DOES NOT think sustainably. It is linked to major issues of deforestation, habitat degradation, climate change, animal cruelty and abuse of land rights for Indigenous people. Large areas of forests have and still are being cleared for the development of oil palm plantations.

World Wildlife Fund, Say No to Palm Oil, www.saynotopalmoil.com/Whats_the_issue.php.

According to the World Wildlife Fund, an area the equivalent size of 300 football fields of rainforest is cleared each hour to make way for palm oil production.

Find out what you can do about this issue. Act sustainably and prepare an information item for your school website or newsletter informing people to stop purchasing products made with palm oil.

REFLECT ON LEARNING

1 Define the term 'lipid'.

2 Explain why we need to include some fat in our everyday diet.

3 Discuss how virgin olive oil is produced.

4 Describe three dietary changes people could make to reduce their saturated fat intake.

5 Is light olive oil better for you than ordinary oil? Explain your answer.

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Carrot cake

RECIPE

Main tools and equipment

Grater, measuring cups, measuring spoons, measuring jug, loaf tin, large bowl, wooden spoon, spatula, skewer, cooling rack, whisk

Production skills

Grating, greasing, mixing, combining, beating

Cooking processes

Baking

SERVES 6–8 (1 CAKE)

Preparation time: 20 minutes

Cooking time: 45–50 minutes

Serving and presentation: 10 minutes

Total time: 75–80 minutes

Ingredients

Cake

 ½ cup olive oil	 2 eggs	 ¾ cup brown sugar	2 carrots, grated	1 cup self-raising flour	⅓ cup sultanas
 1 tablespoon crushed pineapple	 ½ teaspoon mixed spice	 ½ teaspoon cinnamon			

Cream cheese icing

 125 g cream cheese	 3 tablespoons (60 g) icing sugar	 1 tablespoon (60 ml) lemon juice

Method

1. Preheat oven to 180°C.
2. Brush or spray a loaf pan with oil and line with baking paper.
3. Combine oil, eggs and sugar.

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4 Add all other ingredients and mix well.

5 Place into your loaf tin and bake at 180°C for 45–50 minutes. Your cake is cooked when it shrinks slightly from the sides of the pan and springs back to the touch, or the skewer comes out clean and dry.

6 When cooked, let your cake cool in the tin for 5 minutes. Then continue to cool on a cooling rack.

7 For the icing, beat the cream cheese until smooth.

8 Gradually add the icing sugar.

9 Add the lemon juice and beat well until combined.

10 Spread on cake and serve.

Evaluating

1 Describe the appearance, aroma, taste and texture of your cake using sensory analysis language. Write a complete sentence for each of these.

2 List three safety rules you had to follow when producing your cake.

3 Explain the main role of the oil in this recipe.

4 Describe how you tested your cake to check that it was cooked.

5 Explain how your cake provided a solution to the design brief to reduce saturated fat intake.

6 Complete the following sentences:

- **a** My strength today was …
- **b** If I was to make this again I would change …
- **c** Something interesting I learnt from completing this production was …
- **d** I could have improved my performance today by …

DESIGN BRIEF: FLAVOURED OILS

Flavoured oils can be used for cooking, in salad dressings or poured over dishes for presentation. They also make great gifts. There are many different varieties available in the supermarket but flavoured oils are easy to make yourself.

Using at least two complementary ingredients, design your own flavoured oil that you could give to a friend as a gift. You may like to use the recipe on p.270 to help you get started. Include two recipes in which your oil could be used.

Design a label to go on your oil. Include the requirements needed on a food label.

ISBN 978-1-316-64912-1

Rosemary oil

ITALY

RECIPE

Main tools and equipment

Bottle, oven

Production skills

Sterilising, infusing

Ingredients

 300 ml olive oil	 3–4 sprigs rosemary

Method

1. Sterilise a bottle by washing it in hot soapy water and then leaving in an oven heated to 100°C for 20 minutes.
2. Fill the clean bottle with olive oil, almost to the top.
3. Add three or four stalks of rosemary to the bottle and put on the lid.
4. Place in a cupboard and leave for three days. Gently turn the bottle twice a day to disperse the rosemary essential oil through the olive oil.
5. After three days, your oil is ready for use.
6. Your oil will last up to six months if stored correctly.
7. Use your rosemary oil in stir-fries, in bread making, on pasta or as a dipping oil.

SERVES APPROXIMATELY 12

Preparation time: 20 minutes sterilising, 10 minutes preparing, 3 days resting

Serving and presentation: 5 minutes

Total time: 3 days, 35 minutes

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10.3 Sugar and spice and all things nice

Many of the foods we enjoy have salt, sugar, herbs and spices listed in their ingredients. The main reason we add sugar, salt, herbs and spices to food is to enhance flavour, aroma and colour. Many of the foods available today could not be produced without these ingredients.

Your tastebuds become accustomed to the taste of sweet and salty foods, such as savoury snacks, chocolate and lollies.

10.7 ACTIVITY

Finding salt

1 When reading food labels, identify the word you are looking for to locate the salt quantity in the product.

2 List the products you can find in your home or school pantry that do not contain this.

10.8 ACTIVITY

What are you eating?

1 Collect 10 different labels from your pantry or your lunchbox, some sweet and some savoury. If you can, try to include instant noodles, a breakfast cereal, soup and a muesli bar.

2 Copy the table below into your workbook and read each label to find out the information required.

3 Before you start, predict which products you think have the:

- **a** highest sugar content
- **b** highest salt content
- **c** highest saturated fat content
- **d** lowest sugar content
- **e** lowest salt content
- **f** lowest saturated fat content
- **g** lowest trans fat content.

Product name	Total fat	Saturated fat	Trans fat	Salt	Sugar	Flavours
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

4 Now answer these questions using your results:

- **a** Were you surprised by any of these figures? Discuss your reasons.
- **b** Describe the short-term and long-term effects of eating products that are high in sugar, salt and fat.
- **c** List an alternative food item for each of the items highest in the investigated areas.
- **d** Explain why you think food manufacturers use such large amounts of sugar, salt and fat.

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Salt

The chemical term for **salt** is sodium chloride. Salt comes from two main sources: the sea (sea salt) and mining deposits (rock salt). Salt is used not only in savoury dishes, but also in sweet dishes to enhance flavour. While our bodies require a small amount of salt, there are concerns that we are consuming more salt than we should because we have developed a taste for it, just as we have for sugar.

salt Sodium chloride.

Tasty Trivia

In Japanese theatres, salt used to be sprinkled on the stage before each performance to prevent evil spirits from casting a spell on the actors.

Sugar

Sugar is an energy-dense carbohydrate mainly made of sucrose. Sugar is used in most commercial products, even those you would not expect, like tomato soup and peanut butter, as it makes food tasty and brings out flavours, encouraging people to consume more. Sugar has a very important role in many recipes and cooking techniques, with the most important of these being to provide sweetness. Sugar is also a preservation agent, inhibiting the growth of micro-organisms in products like jam and confectionery. Our diet would be very different without the use of sugar.

sugar An energy-dense carbohydrate mainly made of sucrose.

Tasty Trivia

In 2001, astronomers discovered simple sugar molecules floating in the gas around a star about 400 light-years away.

Herbs and spices

Herbs are the leaves of plants, which can be purchased fresh or dried. Herbs deteriorate as they age, losing their colour and flavour. Most herbs grown in the garden can be air-dried. Pick the herbs in the morning, clean the leaves to remove any traces of dirt and lay them flat on a cake rack in a dark, well-aired location. Or you can tie your herbs in bunches and hang them for drying. **Spices** are the dried seeds, buds, fruits, barks or roots of plants. Spices are often sold in their original state – for example, cumin seed – or as a ground powder. Spices do not have a long shelf life once ground, so it is important to buy them in small amounts. As they age, they lose their flavour and fragrant aroma.

herbs The leaves of plants, used to season food.

spices The dried seeds, buds, fruits, bark or roots of plants, used to season food.

History of food flavours

Salt

People have been using salt for preservation for thousands of years. Our appetite for salt grew when our ancestors started settling the land and learnt about the functions of salt. Not only did salt preserve foods such as meat, thus increasing shelf life; it also enhanced food flavour. Salt has an indefinite shelf life, but does absorb moisture, which can make it go lumpy. A great trick is to put a few grains of rice into your salt shaker to help it stay separated.

Sugar

Wild honey was the first form of sugar used as a sweetener by humans and has naturally been part of our diet since time began. The hives of wild bees were raided for the sweet, energy-dense liquid and later bees were encouraged to settle in hives and honey production started. During the sixteenth century, Christopher Columbus brought sugar cane to the Americas and it was cultivated there. Sugar was expensive during these times and was considered a luxury. The first factory to produce raw sugar was opened in Europe in 1801–02. In Australia, we now have a thriving sugar-cane industry.

Tasty Trivia

The traditional diet of Aboriginal and Torres Strait Islander peoples did not contain much sugar. Sweetness was added to their meals using honey from the native bees, blossoms and honey ants.

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Herbs and spices

All traditional cultures have used herbs and spices in their food products. They have often been used throughout history to hide the foul aromas and tastes of foods that may have spoiled or been preserved with large amounts of salt and eaten during the winter, when it was hard to find fresh food. Not only are herbs and spices bursting with flavour, aroma and colour; they are also used for their medicinal properties and some have been used to preserve foods. Many herbs and spices were used in traditional medicine and continue to be used in natural remedies today. For example, ginger tablets are a popular treatment for nausea and motion sickness.

The search for spices was one of the reasons the great explorers such as Marco Polo and Columbus went on their sea expeditions. Spices were brought back to Europe from Asia and Africa, and they were highly valued for their medicinal properties, perfumes and flavour. This made spices very expensive during this time. Some of these spices include cardamom, ginger, cloves, coriander and cinnamon.

Figure 10.16 We regularly use herbs and spices to enhance a dish.

10.9 LET'S COLLABORATE

Typical herbs used in Europe during Medieval times included basil, bay leaves, chives, dill, fennel, juniper berries, marjoram, parsley, rosemary, sage and thyme. Name the herbs you recognise today on this list. List as many food products and recipes for each of these herbs as you can. Do you think any of these products were eaten during Medieval times? Research and explain your answer.

10.10 ACTIVITY

Spices of the world

Read through the spices of world cuisines below. Copy and complete the table below. Research and find two recipes that could be prepared using one or more of the spices listed – ensure that they are traditional recipes for that country. Add two more countries to the table and find out the spices used in their cuisines.

Spices found in popular cuisines

Country/ cuisine	Spices	Two recipes using one or more of these spices
India	Coriander seed, turmeric, cinnamon, cumin, fenugreek seed and leaf, ginger, pepper, chilli, cloves, tamarind, cardamom, saffron	
Morocco	Coriander seed, turmeric, paprika, cumin, cinnamon, ginger, cloves, pepper, chilli	
Africa	Coriander seed, cumin, allspice, ginger, pepper, fenugreek seed	
Middle East	Paprika, pepper, cumin, coriander seed, sumac, thyme, cassia, cloves, cardamom	

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10.10 ACTIVITY continued

Spices found in popular cuisines (continued)

Country/cuisine	Spices	(Two) recipes using one or more of these spices
Indonesia	Coriander seed, cumin, fennel seed, cassia, turmeric, lemongrass, galangal, ginger, pepper, cloves, chilli	
Malaysia		Satay Nasi Goreng
Thailand		Pad Thai Massaman curry
China		Pickled cucumber salad Spring onion flatbread
Japan		Miso soup Chicken kara-age
Mexico		Chili con queso Sweet Mexican corn cake

REFLECT ON LEARNING

1. Explain why sugar is used in food products.
2. Identify the chemical name for salt.
3. Name the original source of sugar.
4. Explain why herbs were used originally in cooking.
5. List some of the spices brought back from the Far East to Europe and the foods produced with these.

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10.4 Nutritional values: Chemical properties

Too much salt and too much sugar are not good for our health, but how do we know how much we are allowed? The *Australian Dietary Guidelines* can help you and your family to determine safe amounts of all flavourings.

Salt

Australians are probably eating more than double the daily recommended salt intake. It is estimated that 75 per cent of our salt comes from processed foods such as bread, margarine, butter, breakfast cereals and cheese. We do need some salt in our diet, as sodium is necessary to maintain the internal water balance within our bodies. However, a high sodium intake has been linked directly to high blood pressure.

Salt occurs naturally in almost all foods and is important because it provides flavour, which is why 'salt' or 'sodium' is listed on the label of almost every food product at the supermarket. Salt is also used to preserve foods, as it draws out moisture and prolongs a product's shelf life. It is positive to see so many products responding to the request to reduce our salt intake. There are now many 'no added salt' and 'low-salt' products on the market. These products must contain no more than 120 mg sodium per 100 g.

10.11 LET'S COLLABORATE

With a partner, research and discuss why we add salt to foods such as eggplant.

10.12 INVESTIGATE IT

Fish sauce is often used in Asian recipes instead of salt. Have you ever tasted fish sauce? Research how this commonly used Asian ingredient is produced and write a short report on the process.

Sugar

While there are many types of sugar, despite their different physical characteristics all sugars are nutritionally the same and do not contain any nutrients other than carbohydrate in the form of **sucrose**. Sugar is high in energy, not nutrients, and while your body does require energy, the best energy source is not sugar but the carbohydrates found in starchy foods like wholegrain cereal products.

sucrose A complex carbohydrate found in many plants and used as a sweetening agent.

fructose The sugar found in fruit.

An exception is **fructose**, the sugar found in fruits, because consuming fruits provides other nutritional benefits such as dietary fibre and vitamins. The major concern about high sugar consumption is the development of tooth decay. Sugar in the mouth is converted to a sticky substance that forms plaque on the surface of teeth; this eats away at the tooth enamel, causing decay and holes.

Herbs and spices

Herbs and spices add excitement to dishes. They can improve the flavour of any product and are often used to flavour healthier dishes that have had their fat, sugar and/or salt content reduced. Research has shown that herbs and spices provide a wide range of nutrients and phytochemicals that help prevent disease and contribute to better health. They contain high concentrations of antioxidants, as well as a variety of vitamins including vitamin C. Chinese medicine uses many herbs and spices in treatments – for example, garlic for protection against coughs and colds, and liquorice for the relief of constipation.

REFLECT ON LEARNING

1. Discuss why nutritionists are concerned that we are consuming too much salt.
2. List three everyday strategies to reduce salt intake.
3. Describe the consequences of consuming too much sugar.
4. Herbs contain phytochemicals. Explain what they are and why they are important for good health.
5. Other than for flavour, list two reasons for the use of herbs and spices in foods.

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Types of sugar

The sugar with which most people are familiar is white table sugar, which is used commonly in households every day. However, there are a number of different types of sugar available and used in food production. Sugar is extracted from sugar cane or sugar beet and then refined into a number of different forms.

Tasty Trivia

Can you believe that one can of soft drink contains 7–15 teaspoons of sugar? Measure out this amount to see just how much sugar this really is. Do you still feel like having a soft drink with lunch?

Sugar	Description	Uses in cooking
Brown 	Soft, moist, brown-coloured sugar with a very fine crystal size; often clumps together and needs separating.	Baking and dark confectionery
Caster 	A white-coloured fine crystal.	Cakes, meringues and puddings
Cube 	White sugar granules moistened and moulded together to form a cube shape.	Popular with coffee and tea drinkers as the exact measure can be guaranteed every time.
Golden syrup 	A golden brown syrup made from the sugar cane refining process.	A main ingredient in the popular Aussie 'Anzac' biscuit; used in cake and biscuit making.
Honey 	Golden to pale brown sweet syrup.	Commonly used as a spread, but also popular in baked goods, confectionery and breakfast cereals.
Icing sugar 	A fine white powder, which forms lumps if stored for long periods.	Confectionery and icing, and often sprinkled on cakes as decoration.
Raw sugar 	A duller white, larger-sized sugar crystal.	Used mostly as table sugar but also for baked goods and confectionery.
Treacle 	A dark brown to black-coloured, thick syrup with a strong aroma.	Liquorice, confectionery and baking.

Figure 10.17 Popular sugars

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Cinnamon scone scrolls

SWEDEN

Main tools and equipment

Sieve, measuring cups, measuring spoons, measuring jug, large bowl, baking tray, pastry brush, cooling rack

Production skills

Measuring, rubbing in, kneading, rolling, slicing, glazing

Cooking processes

Baking

SERVES 8

Preparation time: 30 minutes

Cooking time: 12–15 minutes

Serving and presentation time: 5 minutes

Total time: 47–50 minutes

Ingredients

 30 g butter	 2 cups flour	 ¾ cup milk	75 g butter
 ½ cup brown sugar	 3 teaspoons cinnamon	 1 teaspoon milk (glaze)	

Method

1. Preheat oven to 200°C. Line a baking tray with baking paper.
2. Rub 30 g of butter into the flour until it resembles breadcrumbs.
3. Add milk until mixture comes together to form a soft dough.
4. Turn dough onto a lightly floured bench and knead until just smooth.
5. Roll dough into a rectangle, about 5 mm thick.
6. Cream the 75 g portion of butter with the sugar. Add the cinnamon and mix well.
7. Spread cinnamon mixture over dough.

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Cinnamon scone scrolls – continued

8 Roll up into a log and cut into between 10 and 12 equal portions.

9 Lay portions flat on a baking tray. Remember that they will rise and spread, so leave space between each one.

10 Glaze with milk.

11 Place in oven to bake for 12–15 minutes or until golden brown.

12 Remove from oven and cool on a wire cooling rack.

Evaluating

1 Describe how you knew you had successfully rubbed in your butter.

2 Explain the role of the cinnamon in this recipe.

3 Suggest what would or wouldn't happen if you forgot to glaze your scrolls with milk.

4 Imagine that you have run out of cinnamon. Suggest alternatives that you could use.

5 Determine whether this recipe is an 'everyday' or a 'sometimes' snack. Justify your decision.

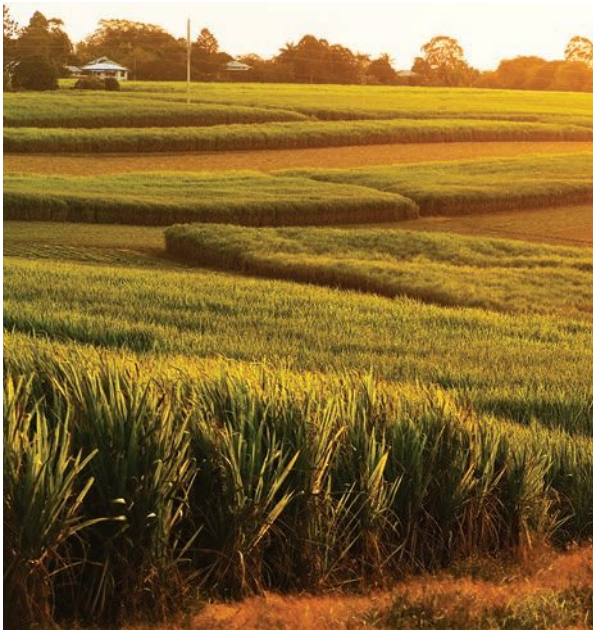
10.13 ACTIVITY

Sweet sugar

Research the process through which sugar goes from the sugar cane field until it ends up as refined sugar available for purchase in the supermarket. Design a poster or comic that illustrates and describes each processing stage.

Use your preferred browser to search for the following websites to help you get started:

- Bundaberg Sugar
- Sugar Knowledge International
- The Sugar Association.



DESIGN BRIEF: A CLASSIC DESSERT

The Golden Syrup Dumplings recipe on p.279 is an old-fashioned, popular dessert, which uses, obviously, golden syrup. Golden syrup has a long history in Australia due to our big sugar plantations in Queensland. Investigate and produce another old-fashioned, classic dessert that uses a sugar product such as sugar, honey or golden syrup as a main ingredient.

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Golden syrup dumplings

UNITED KINGDOM

Main tools and equipment

Sieve, measuring cup, measuring spoons, measuring jug, metal spoons, saucepan, baking dish

Production skills

Measuring, sifting, rubbing in

Cooking processes

Boiling, baking

SERVES 2

Preparation time: 5 minutes

Cooking time: 30 minutes

Serving and presentation time: 5 minutes

Total time: 40 minutes

Ingredients

Dumplings

 1 tablespoon (20 g) butter	 ½ cup (75 g) self-raising flour	 ¼ teaspoon powdered ginger	1 egg, beaten	 1 tablespoon (20 ml) milk

Syrup

 ¾ cup (190 ml) water	 2 tablespoons (40 ml) golden syrup	 2 teaspoons (10 ml) lemon juice	1 tablespoon (20 g) butter

Method

1. Preheat oven to 190°C.
2. Rub the butter into the flour and ginger using your fingertips until it resembles breadcrumbs.
3. Add egg and milk, and mix into a soft dough.
4. Place spoonfuls of the dough mixture into a medium-sized baking dish.
5. Place syrup ingredients in a saucepan and stir until dissolved.
6. Bring to the boil. When boiling, pour over dough in baking dish and bake at 190°C for 30 minutes.
7. Serve on its own or with cream or ice-cream. An alternative is to sprinkle with coconut.

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Golden syrup dumplings – continued

Evaluating

1 Using your sensory analysis skills, describe the appearance, aroma, taste and mouthfeel of your dessert.

2 Explain the role of the golden syrup in this old-fashioned, classic dessert.

3 Suggest another way you could present your sweet treat.

4 Did you find this task difficult? Explain your answer.

5 Complete the following statements:

- **a** I'm proud of this because …
- **b** My strength today was …
- **c** I needed help with …
- **d** What I need to improve most now is …
- **e** One thing I am still not sure about is …

10.5 About thyme: Herbs

Herbs are a fantastic way to add flavour to your food, and there are so many different varieties that can be used in so many different ways. It is important to remember to always wash your herbs and shake them dry before you use them to ensure they are free of dirt and insects. You can use either fresh or dried herbs in a recipe. One tablespoon of fresh herbs is equivalent to a teaspoon of dried herbs.

Herb	Source/origin	Uses in cooking	Did you know?
Basil 	Greece and Italy; also an important ingredient in the cuisines of Thailand, Vietnam and Laos.	Main ingredient in pesto; used in pasta dishes, salads, herb butters and vinegars, and even used to make sorbet.	The name 'basil' comes from the Greek word for 'kingly herb' and this herb was cultivated by monks. There are different varieties of basil, such as purple and Thai basil.
Bay leaf 	Native to Mediterranean countries, including Greece and Italy.	Bay leaves are used to flavour stocks, soups, casseroles, corned beef and marinades; the leaf is usually removed from the dish after cooking.	Bay leaves were used to make wreaths to crown heroes in ancient times. They can be picked from the bush and used straight away.
Coriander leaf 	South-western Asia.	Used in many cooked and fresh dishes, such as curries and stir-fries, as well as salads and dips.	Coriander is the only product that can be both a herb and a spice, as we use the seeds, stems and leaves of the coriander.
Lemongrass 	Native to South-East Asia.	Commonly used in Thai cooking, in marinades, chicken, fish and soup dishes.	You have to bruise the stalk before use to release the oils and only the white section is used in cooking.
Lemon myrtle 	Native to Australia, one of the most commonly used indigenous ingredients.	A very versatile herb used in both savoury and sweet dishes, including ice-cream, bread, fish, chicken and tea.	One of the most popular of Australia's native herbs, lemon myrtle is also used in products such as shampoo and soap for its pleasant aroma and essential oil components.

Figure 10.18 Popular herbs

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Herb	Source/origin	Uses in cooking	Did you know?
Mint 	Native to Mediterranean countries, including Greece and Italy.	Used in lamb dishes, desserts, confectionery, ice-cream, beverages and tea.	The most popular mint species are peppermint, spearmint and more recently apple mint. Mint is the most popular toothpaste flavour. Mint is a good companion plant, repelling pest insects.
Oregano 	Greece and Italy.	Pizzas, pastas, fish and meat dishes, casseroles and marinades.	Oregano is very important in Greek and Italian cuisines.
Tarragon 	France.	Béarnaise sauce, chicken, fish and egg dishes.	Tarragon is one of the four 'fine herbs' of French cooking.

Figure 10.18 Popular herbs (continued)

10.14 ACTIVITY

Using herbs

1 Name a herb that is:
   - **a** used to flavour vinegar
   - **b** used in many Italian dishes and featured as a garnish on many dishes
   - **c** used commonly with fish and seafood dishes
   - **d** used to make a sauce that is served with roast lamb
   - **e** often used in soups and casseroles but always removed before eating.

2 Now list five more herbs not mentioned in the table and compare your list with that of a classmate.

Check out parsley

You will probably be familiar with the 'humble' parsley. It is easily grown in the backyard herb garden and has been a simple but common garnish on plates for many years. It is said in Greek mythology that parsley grew from the blood of Archemorous, the forerunner of death, and one of the ways in which the ancient Greeks used parsley was for funerals. There are two different types of parsley: flat leaf or Italian parsley; and curly parsley.

Parsley is rich in iron and vitamins A, B and C, and can be a good source of these nutrients because there are recipes where parsley is eaten in large amounts. For flavour, the parsley should have unwilted leaves and a firm stem. It is best to store parsley in cold water; it should last up to a week.

Figure 10.19 Curly leaf parsley (top) and flat-leaf parsley.

10.15 LET'S COLLABORATE

1 Investigate the countries where rosemary, parsley and mint traditionally are used. Find one recipe that uses each herb for each country you have identified.

2 With a partner, research and identify any recipes that include large amounts of parsley as an ingredient.

10.16 INVESTIGATE IT

Why not try growing your own herbs at home or at school? Visit the Yates website for lots of information and podcasts to help you get started. Now you just have to decide what to grow.

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Tabbouleh

LEBANON

RECIPE

Main tools and equipment

Chef's knife, measuring spoons, chopping board, kettle, small bowl

Production skills

Washing, chopping, dicing, mixing

Cooking processes

Combining

SERVES 2

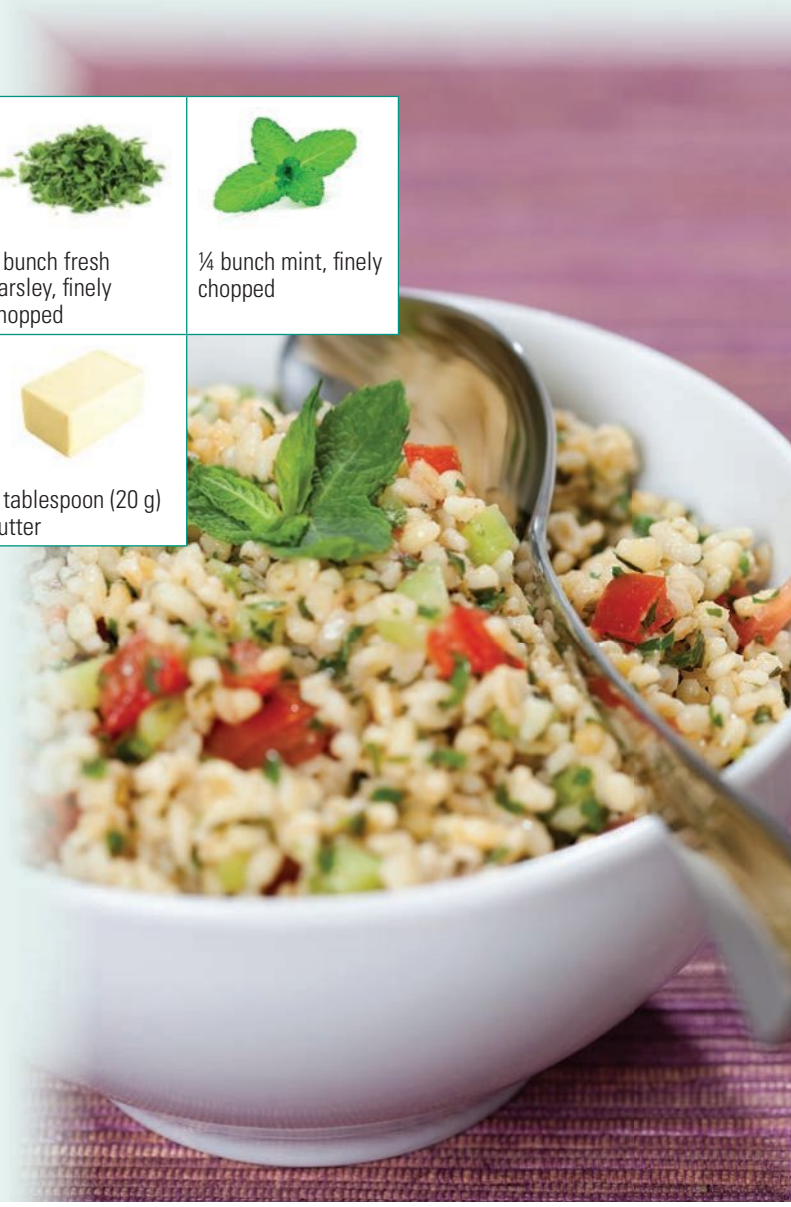
Preparation time: 20 minutes

Serving and presentation: 5 minutes

Total time: 25 minutes

Ingredients

 2 tablespoons (40 ml) lemon juice	 2 tablespoons (40 ml) boiling water	 2 tablespoons (40 g) burghul	1 bunch fresh parsley, finely chopped	¼ bunch mint, finely chopped
 2 tomatoes, finely diced	 2 spring onions, finely chopped	 2 teaspoons olive oil	1 tablespoon (20 g) butter	



Method

1. Wash and drain the herbs well and dry on a paper towel.
2. Pour lemon juice and boiling water over burghul and leave to soften for 10–15 minutes.
3. Combine the parsley, mint, tomatoes, spring onions and softened burghul.
4. Mix in olive oil and season with salt and pepper to taste.
5. This can be served on its own. Alternatively, serve with flat bread, souvlaki or falafel.

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10.6 Spice up your life: Spices

Like herbs, spices are also an excellent way to add flavour, aroma and colour to food. Most of the important spices are native to Asian regions, such as cinnamon, pepper, ginger, cloves and nutmeg. Allspice, vanilla and chillies come from the West Indies and Central America, and coriander, fennel, fenugreek and mustards are all found in the Mediterranean region.

Spice	Part used	Uses in cooking	Did you know?
Cinnamon 	Bark	Used in both savoury and sweet dishes, including curry pastes, Moroccan tagines and Indian rice, chocolate desserts, cakes, drinks and cinnamon toast; also used for mulled wine.	Cinnamon is indigenous to Sri Lanka. It is often used in incense and potpourri. There are references to cinnamon in the Bible.
Cloves 	Bud	Add flavouring to roasted meats; used in pies, baked fruit dishes, cookies, biscuits and gingerbread.	The word 'clove' comes from the French word for 'nail', as it is shaped like a small fingernail. Indonesia produces 80 per cent of the world's cloves. In Roman times, the clove, along with the nutmeg and pepper, was highly prized.
Coriander seed 	Seed	The seed is ground to flavour curries and Indian dishes.	Coriander is the only product that can be both a herb and a spice, as we use the seeds, stems and leaves of the coriander.
Saffron 	Stamen	Used in curry powders, sauces, soups, paella, bouillabaisse, risotto; it is not only used for its flavour, but also its vibrant yellow colour, which dyes the food.	Saffron is the most expensive spice in the world because each stamen has to be hand picked. Also used as a dye by many cultures, including Buddhist monks, who colour their robes with it.
Star anise 	Pod	Used to flavour Asian soups, marinades, spice mixes and chai tea; an ingredient commonly used in Indian, Chinese and Vietnamese cuisines.	Star anise fruits are harvested unripened and dried in the sun, during which time they develop their characteristic aroma and flavor, and deep, reddish-brown colour.
Vanilla 	Bean	Used in ice-cream, custards, baking and chocolate; you can also make vanilla sugar by placing a bean in a jar of sugar.	Vanilla has been used for centuries by the Aztecs in Mexico and was offered as a tribute to the Aztec emperor by his people. Real vanilla is expensive, so cheap, chemical imitations are common. This product is known as vanilla essence; vanilla extract is natural. Vanilla is not only used in foods, but is also found in many perfumes.
Wattle seed 	Seed	Native to Australia, wattle seed is used in many ways, including flavouring ice-cream, thickening sauces, being added to breads and damper, and in casseroles.	Wattle seed is a good source of protein and carbohydrate, and has been part of Aboriginal and Torres Strait Islander peoples' diets for thousand of years. Seeds can be crushed to make flour.

Figure 10.20 Popular spices

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10.17 LET'S COLLABORATE

Black pepper is the most popular spice around the world. Cumin is the second most popular. Answer the following questions as a class.

1. Do you know these spices?
2. Why do you think these two are the most popular?
3. Can you name any countries that use these spices?

Tasty Trivia It is very easy to make your own chai tea. It is simply a mix of spices and tea leaves with milk added if you wish. Try it for yourself.

10.18 ACTIVITY

Using spices

1. Name a spice that matches each of the following descriptions:
   - **a** the common ingredient used to flavour ice-cream
   - **b** used in many Indian dishes
   - **c** the most expensive spice because it has to be picked by hand
   - **d** used commonly in many dishes, often fried up with onions
   - **e** used to sprinkle on the top of a true Italian cappuccino (it is not chocolate and in its natural state it is rolled up)
   - **f** often used in apple crumble but always removed before eating.
2. Now write five of your own spices and swap your list with a classmate.

Figure 10.21 Traditional chai tea is brewed with an aromatic array of star anise, cinnamon, cloves, allspice and white peppercorn.

Check out ginger

Ginger is a root vegetable with a fresh and zingy flavour. It is used in products for its great flavour and aroma, and is a very versatile spice as it is used in both sweet and savoury dishes, such as ginger ale, gingerbread, curries and confectionery. Ginger was originally cultivated in China and has been used for centuries in traditional medicine. It was one of the first spices to reach Europe during the spice trade. When purchasing fresh ginger, it is best to buy a firm, fresh-looking root that doesn't bend. It can be stored in the fridge for two weeks if wrapped in foil. When cooking with fresh ginger, peel off the skin with a vegetable peeler, then slice or grate as required. It is also great in fresh tea with hot water, lemon and a little honey for a quick pick-me-up.

Tasty Trivia Ginger is resorted to as the best cure for some of the simple ailments or common problems such as vomiting, nausea, digestive complaints and morning sickness. A cup of ginger tea in the morning may provide you with more vigour and freshness than an ordinary cup of tea.

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Figure 10.22 Ginger can be used for both sweet and savoury dishes.

REFLECT ON LEARNING

1. Explain why soft drink is often referred to as 'empty calories'.
2. Describe the difference between herbs and spices.
3. Identify the parts of the plant that can be used as a spice.
4. Name five different spices that are used in sweet dishes and identify the recipes.
5. Describe the different forms in which herbs and spices can be purchased.

10.19 ACTIVITY

Reflections

Reflect back on your learning from this chapter by answering the following questions:

1. What did you learn from completing the activities and recipes in this chapter?
2. Of the activities that you completed, which did you enjoy most?
3. Of the activities that you completed, which did you find the most challenging?
4. What would you do differently if you were to complete these activities again?
5. Which areas would you like to learn more about?

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LOOKING BACK

1 Lipids play a very important role in food as they contribute to flavour, texture and aroma. Fats, a type of lipid, are solid at room temperature and are usually from animal sources, whereas oils are usually liquid at room temperature and often from plant sources (seeds and nuts). Fats are a major energy source, and also contain vitamins A, D, E and K.

2 There are four main types of fats: saturated, trans, monounsaturated and polyunsaturated. Saturated fats are found in all animal products and a few vegetable products, and are generally solid at room temperature. Fats are often described as 'good' fats and 'bad' fats. The 'good' fats are both the monounsaturated and polyunsaturated fats.

3 Sugar is an energy-dense carbohydrate mainly made of sucrose. Herbs are the leaves of plants, which can be purchased fresh or dried. Spices are the dried seeds, buds, fruits, barks or roots of plants. The main reason why we add sugar, salt, herbs and spices to food is to enhance its flavour, aroma and colour.

4 Salt occurs naturally in almost all foods. It is important because it provides flavour and also preserves foods. Sugar does not contain any nutrients other than carbohydrate. Herbs and spices add excitement to dishes; they can improve the flavour of any product and research has shown that herbs and spices provide a wide range of nutrients.

TEST YOUR KNOWLEDGE

Multiple choice

1 Which of the following are sources of 'good' fats?

- **a** avocado
- **b** olives
- **c** tuna
- **d** all of the above.

2 Which of the following parts of a plant can be used as a spice?

- **a** seed
- **b** bark
- **c** root
- **d** all of the above.

True/false

1 Sugar is a nutrient-dense carbohydrate.

2 Saffron is the most expensive spice to use.

3 All fat should be avoided.

Short answer

1 Australian Dietary Guideline number 3 says, 'Limit intake of food containing saturated fat, added salt, added sugars and alcohol.' Explain the reason for this guideline. Suggest two strategies to reduce consumption of saturated fats, added sugar and added salt in your everyday diet.

2 Discuss in detail the reasons why fat, salt, sugar, herbs and spices are used in so many different food products.

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Extended response

Choose one herb and one spice to research that has not been discussed in this chapter. Investigate the following information:

1. Describe the appearance of the herb and spice.
2. Explain which part of the plant is used for the herb and spice.
3. Summarise the history of each.
4. Describe any medicinal ways in which the herb or spice may be used.
5. Find two recipes for each.

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CHAPTER 11

Making considered food choices

ACCESS PRIOR KNOWLEDGE

1. Discuss how your family influences the foods that you eat.
2. Outline cultures/religions that have specific food rules and customs.
3. Describe how where you live impacts your food choices.
4. What we eat is an issue of sustainability. Name the environmental concerns influencing our food choices.
5. Discuss whether organically produced foods are better for you.

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11.1 What factors influence the food choices of a young person?

internal Describes factors that influence food choices of people – for example, family and culture.

external Describes factors that influence food choices that are outside a person – for example, advertising and the media.

culture Beliefs, customs, traditions and social practices of a group of people.

peer group A social group of people who are equal in terms of age.

ethics The science of how we should live or attempt to live. Behaviours and decisions that reflect right or wrong.

social factors The factors influencing food choice that are related to the interaction of people.

cultural factors The beliefs, customs and practices of a particular group of people that influence food choice.

family A group of related people, including parents, children and grandparents.

lifespan The length of time that a person can be expected to live and the stages through which they will progress – for example, infancy and adolescence.

Choosing food for good health is often difficult. Think about the food that you have eaten today. Were you really hungry when you ate? Who prepared the food you ate?

There are a large number of **internal** and **external** factors that influence the food choices of a young person. Our family, **cultural** background, religion and beliefs, friends or **peer group**, our **ethics**, the properties of food and the way we are feeling (our emotional state) all have an influence over the foods that we choose to eat.

Social, ethical and **cultural factors** play a major role in the foods that we eat.

11.2 Social influences

Some activities that we share with our family and friends involve food and eating. These two groups of people therefore play an important role in introducing us to new foods as well as in shaping our food opinions and preferences.

Family

Our **family** has a major influence on the foods that we choose to eat. Throughout our **lifespan** it is mainly our family who influence our food skills and knowledge. They have a major impact on our nutritional knowledge and therefore our food consumption.

11.1 LET'S COLLABORATE

What did you eat last week? Develop a list of the foods that you have eaten, where you ate them and with whom. With a partner, talk about who prepared the food you ate. Explain whether you chose the food or whether it was prepared for you by someone else. Identify the cultural influences and the country of origin related to the foods you ate.

Figure 11.1 Our peers are likely to influence our food choices.

Figure 11.2 Family has a major influence on our food choices.

Our food preferences (likes and dislikes) and willingness to try new foods are the result of family influences, as are the foods that are available to us.

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Figure 11.3 You can do much more with Brussels sprouts than boil them!

Consider this: if your parents choose to purchase Brussels sprouts, cook them in an interesting way and encourage you to try them, then you may discover that they are a delicious vegetable. Likewise, if the person who purchases the food in your family chooses to buy a variety of fresh fruits, you are able to see that these really are a tasty snack. Additionally, if you eat these foods regularly, your body comes to crave them.

Tasty Trivia

A Chinese meal may start with some cold dishes, like boiled peanuts and smashed cucumber with garlic. These are followed by the main courses, hot meat and vegetable dishes. Finally, soup is brought out, which is followed by the starchy 'staple' food, which is usually rice or noodles or sometimes dumplings.

Family meal patterns also influence the foods we choose to eat. Research suggests that those people who sit down to the table to eat a meal together as a family are more likely to eat foods that are healthier. Some families whose members do not sit at the table and eat together are more likely to eat foods that are higher in saturated fat and are often not prepared with fresh ingredients.

11.2 ACTIVITY

Family meals

1 Conduct a quick survey of your classmates. Find out the number of people who usually:
   - **a** sit at the dinner table as a family to eat their dinner
   - **b** sit on the couch to eat their dinner
   - **c** eat breakfast at the table with another person
   - **d** do not eat breakfast at all
   - **e** eat fast foods on the run.
2 Explain how breakfast is consumed in your family. Describe how this compares with the rest of your class.
3 Discuss why breakfast is one of the most important meals of the day.
4 Describe three factors that influence your eating habits at home.
5 Explain the reasons why you think people talk to each other more if they sit at the table to eat.
6 Outline the family values that can be reinforced when family members are eating meals at a table.
7 If you sit at the table, food is often eaten more slowly. Suggest why you think this is so. Explain why you think this is better for our digestive systems.
8 Discuss reasons why families are eating together less than they did in the past.

11.3 LET'S COLLABORATE

It can be a challenge for families to sit and share a meal every night. Identify the barriers to this. Design a tweet that could be posted to encourage families to share at least one meal together each week.

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Figure 11.4 Different families have different eating habits.

11.4 ACTIVITY

Our Australian food and culture

Research the meal patterns of Aboriginal and Torres Strait Islander peoples living in traditional ways. Develop a picture collage of 10 different foods consumed.

Compare these with those of non-Indigenous Anglo-Australian families or another group of Australians (such as Chinese, Greek or Lebanese Australians). Remember that when we compare we should discuss both similarities and differences. Collate your findings using a Venn diagram.

Figure 11.5 A grandparent showing young children how to gather traditional foods.

Social influences, such as the daily lives of our families, also have a major impact on the foods that we eat. Often, our parents have to go to work, and this influences the time they have available to prepare meals.

Our cooking skills, food and nutritional knowledge are a result of what we have learned from our family members. Grandparents or the elders of the family often pass their cooking skills on to their children and grandchildren.

Think about who is important in your family when it comes to teaching food skills. Explain what you have learnt from your family about cooking and food choices.

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11.5 LET'S COLLABORATE

In many cultures, cooking is a family celebration. For example, Sauce or Sugo Day is an annual event in many Italian families, with members spending the day together making the sauce for the rest of the year. Cooking skills and food knowledge have been passed from generation to generation within families.

Are there any special or secret recipes in your family? Do you have family celebrations or days based on cooking? Share your answers with the class.

CREATE A SOLUTION

You have been asked to share your family cooking secrets with your class.

Ask your family members about special family recipes, cooking secrets or signature dishes. Prepare a food order and time plan for your production.

Produce your special family dish at school. Invite your family member to school to make it a real social celebration of food sharing.

Peers

Peers are one of the major social influences on our food choices. Peer influence is an indirect influence – this is where we learn from our peers' behaviours and often copy or model their behaviours subconsciously. The same is true when it comes to food choices. Peers can have a negative impact on food choices. Consider what happens when several young people visit the school canteen – it is likely that they will copy each other's behaviours and choose the same or similar foods to eat. These foods are often poor food choices in terms of their nutritional content.

11.6 LET'S COLLABORATE

Discuss how your peers or friendship group members influence your choice of foods, as well as when and where you choose to eat.

Peers can also have a positive influence on food choices. The social support provided by our peers can have a beneficial effect on food choices and on healthy dietary change. Social support provided by peers in terms of healthy food choices can mean that we have a sense of group belonging – it is like a 'we are all in this together' feeling.

Figure 11.6 Who influences your food choices?

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11.7 ACTIVITY

Evaluate your food consumption

Most meals these days are still eaten inside the home, although an increasing proportion of meals are being eaten outside the home: at school, at work and in restaurants.

1 Think about your food consumption over the past two weeks. Using your workbook or computer, develop a table like the one below. Complete the table to make a list of the times food was consumed inside the home or outside the home in another social setting.

Foods consumed inside the home	Foods consumed outside the home

2 In what social settings did you consume food? Discuss food consumed inside and outside your home.

3 Discuss the foods that you ate when you were with your friends. Evaluate the nutritional value of these foods.

4 Analyse how the place or venue where you consumed food affected your choice of food. Explain your findings.

5 Discuss the types of foods that were available to be eaten at home. Do you consider these to be healthy food choices? Discuss your response.

6 List the types of foods that were available to be eaten outside the home. Do you consider these to be healthy food choices? Discuss your response.

Figure 11.7 Is a hotdog that you buy from a vendor the same as the hotdog you make at home? Which is better?

11.3 Cultural influences

Cultural influences that come from different ethnic groups can have a huge influence on people's food choices. Culture can influence the consumption of certain foods, can provide the traditional methods used to prepare foods and can lead to restrictions placed on the consumption of certain foods, such as the **exclusion** of meat and milk from the diet.

exclusion Preventing someone from eating a certain food.

Culture has also influenced the number of different foods available in Australia. Migrants to Australia have brought with them lots of different food products and ingredients, methods of cooking and other food knowledge. This knowledge and these products have now become part of our everyday Australian food culture.

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Figure 11.8 Chinatown in Melbourne is a popular destination for many people to eat out; there is a choice of almost 100 places to eat and drink.

11.8 LET'S COLLABORATE

Many cities have a Chinatown. Discuss the influence that these types of cultural hubs have had on our food consumption.

Tasty Trivia

Cultural influences can change. When people move to a new country, they may adopt particular food habits of the local culture, but research shows that the food people cook at home is the last to change. Australia truly has a multicultural food culture.

11.9 ACTIVITY

Food from around the world #1

As a result of immigration, Australia has foods from many different cultures.

1. Develop a list of the foods from different cultures that you have consumed in the past week.
2. Develop a list of the foods from different cultures that your family eats regularly.
3. Compare your list with those of your classmates.
4. List the three most commonly eaten foods from another culture. Try to predict the answers before you have the results.

If you walk through the supermarket today and take a close look at the shelves, you will see that there is an array of food items from many different cultures. Large supermarkets even have sections of their shelves dedicated to particular foods – for example, Indian or Mexican.

Figure 11.9 Many different cultures contribute to the foods you can find in the supermarket deli and on the shelves. Can you identify some of the countries of origin of the food in these pictures?

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11.10 ACTIVITY

Food from around the world #2

1 Investigate foods from around the world. Choose from one of the places listed below, then prepare a dish to share with your class so that you can have a world feast:

- China
- England
- Fiji
- France
- Germany
- Greece
- Indonesia
- Ireland
- Italy
- Jamaica
- Japan
- Korea
- Latvia
- Lebanon
- Malaysia
- Mexico
- Morocco
- Nepal
- Pakistan
- Portugal
- Russia
- Samoa
- Scotland
- South Africa
- South America
- Thailand
- Turkey.

2 Share with the class why you have chosen to prepare your dish.

11.11 ACTIVITY

Food from around the world #3

Visit your local supermarket and collect supermarket catalogues. Alternatively, go to a supermarket website like Coles Online to answer the following questions:

1 Make a list of five products that are on the shelf from each of these cultures:

- Asian
- Greek
- Indian
- Italian
- Lebanese
- Japanese

2 Find five other food products that you have never eaten or seen before. Write down the names of these products and suggest the food culture from which they have originated.

3 Find three products on the shelf that are not made in Australia. Write down the names of these products and their country of origin.

DESIGN THINKING: REDESIGNING THE AUSSIE BARBECUE

Barbecues are popular in countries where there is good summer weather, like Australia. The best barbecue meats must cook quickly and be tasty to eat.

You want to celebrate the contribution that other food cultures have made to Australian cuisine by having an Aussie barbecue with a difference, one that represents barbecue foods from different countries.

Investigate barbecue foods from at least three different countries – for example, Greece, Italy and Fiji. One example of a barbecue dish from Greece is Souvlaki. Traditionally, it is served with lamb, onion and red capsicum. Name three other salad vegetables with which it could be served. Suggest a different sauce or flavouring with which the souvlaki could be served.

Write three criteria for success from the brief.

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Greek souvlaki (skewered lamb)

GREECE

RECIPE

Main tools and equipment

Knife, grater, bowl, measuring spoons, measuring cup, skewers

Production skills

Dicing, grating, marinating

Cooking methods

Grilling

SERVES 2

Preparation time: 40 minutes

Cooking time: 8 minutes

Serving and presentation time: 5 minutes

Total time: 53 minutes

Ingredients

 250 g lamb, cut into 2 cm cubes	 ½ tablespoon olive oil	 2 tablespoons lemon juice	 1 teaspoon lemon rind, finely grated	 ¼ teaspoon dried oregano
 1 clove garlic, finely chopped and 1 clove garlic, crushed	 ½ bay leaf	 ¼ teaspoon crushed black pepper	¼ cup Greek-style plain yoghurt	2 slices pita bread

Method

1. Place the cubed lamb into a small bowl.
2. Add the olive oil, lemon juice and lemon rind, oregano, chopped garlic, bay leaf and black pepper.
3. Toss to coat lamb. Place aside for 10 minutes.
4. Place the yoghurt and crushed garlic into a bowl, mix together well.
5. Drain the lamb and pat dry.
6. Thread onto four skewers and cook under the grill for 5 minutes.
7. Turn and cook for a further 3 minutes.
8. Place the souvlaki into the pita bread and serve with the garlic yoghurt.

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Evaluating

1 Evaluate the Greek souvlaki using the criteria for success from the brief.

2 Critically evaluate and analyse your own level of skill when producing the Greek souvlaki.

3 Analyse the sensory properties of your final product. In your analysis, consider appearance, aroma, taste/flavour and texture.

4 Research other green foods that traditionally would be served with Souvlaki.

CREATE A SOLUTION

Develop a grilled souvlaki that you could serve to a person who is a vegetarian.

Religion and personal beliefs

Religion and food are often closely related. Individuals and religious communities have sets of beliefs or opinions with regard to food and food consumption. It is these personal beliefs or values by which a person lives that can influence their food choices. Each religion has evolved with a set of rituals or customs that are important to the members of that religion and often includes food customs.

religion A strongly held set of beliefs, values or attitudes by which someone lives.

Food plays a number of different roles in religion. For some people, food is considered a way by which the individual can communicate with their god. Food is also a way to demonstrate faith through acceptance of requirements concerning the consumption of certain foods. It could also be a way of developing discipline or faith through fasting.

11.12 LET'S COLLABORATE

Name an occasion when your family comes together to eat. Explain the significance of this special occasion for your family. Discuss any other influences related to this occasion.

For some religions, dietary restrictions can influence food choice, preparation and consumption. Dietary restrictions associated with religion can include: foods that can and cannot be eaten; foods that can be eaten at certain times of the year or day; how food should be prepared; and when and how long to fast.

Figure 11.10 The food you eat may depend on your religion – for example, Hare Krishna devotees practise vegetarianism.

We all have our own personal beliefs about food, which for some are influenced by religion. Sometimes food is just about fun and enjoyment – many people get pleasure out of the experiences that they have when eating a particular food. At other times, the foods that are eaten are significantly influenced by religious or cultural beliefs. For example, all people belonging to the Hare Krishna movement eat a vegetarian diet.

Aboriginal and Torres Strait Islander peoples

Aboriginal and Torres Strait Islander peoples' traditional beliefs and cultural practices vary according to their region, although all groups do share in a common world-view that the land and other natural phenomena possess living souls. The collection of stories of these powerful beings and the knowledge represented in these stories shape Aboriginal and Torres Strait Islander peoples' culture and influence food choices.

The Dreaming is the English name given to the beliefs of Aboriginal and Torres Strait Islander peoples.

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Figure 11.11 A totem, such as the emu shown in this dot painting, should not be eaten.

totem A totemic being represents the original form of an animal, plant or other object (totem), as it was in the Creation period.

Their **totem** has an influence over their food choices. Some groups prohibit an individual from eating their own totem and others need permission to catch another person's totem on their land – for example, a man whose totem is a waterfowl would not eat that bird.

11.13 INVESTIGATE IT

Research the traditional foods of Aboriginal and Torres Strait Islander peoples, particularly foods used for celebrations. Prepare one of these foods in your Home Economics class.

Christianity

Christianity is the predominant religion in Australia. Strict Roman Catholics follow the dietary practice of not eating any meat on Friday. This practice is also followed on Good Friday, during Lent and before communion.

The Orthodox religion has strict fasting days every Wednesday and Friday, and during Advent and Lent. 'Fasting' for this religion means avoiding certain foods, but not all foods. All animal products and fish are avoided on fast days. There are also a number of specific feast days when particular foods are consumed.

The Protestant faith has considerable diversity with little emphasis on fasting or holy days except for Christmas and Easter.

Figure 11.12 This mackerel and orange salad is a good food choice for Christians who avoid eating meat on Fridays.

Figure 11.13 For many Christians, Christmas is a time for family, friends and neighbours to get together and celebrate the birth of Christ.

Tasty Trivia

Seventh-Day Adventists are **lacto-ovo vegetarians**; they avoid tea, coffee and alcohol, as well as tobacco products; and they also practise moderation.

Seventh-Day Adventists A Christian denomination distinguished by its observance of Saturday as the Sabbath.

lacto-ovo vegetarian A type of vegetarian who eats dairy and egg products but no meat.

11.14 INVESTIGATE IT

The Methodists, Jehovah's Witnesses, Baptists and Mormons belong to Christian denominations. Use the internet to investigate their food practices and beliefs. Prepare a multimedia visual display to present to the class that summarises your findings.

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Judaism

Kashrut is the body of Jewish law dealing with what foods are permitted and how these foods should be prepared and eaten. 'Kashrut' comes from Hebrew meaning 'fit', 'proper' or 'correct'. The more commonly known word, **kosher**, describes food that meets these standards. Kosher can also be used to describe ritual objects that are made in accordance with Jewish law and are fit for ritual use.

kosher Food that has been prepared so that it is fit to eat under the food requirements of the Jewish religion.

Kosher foods are the permitted foods, and these foods must have been prepared according to the kosher rules.

Figure 11.15 This label indicates to Jewish people that the food has been prepared according to kosher rules.

A number of holy days and festivals are celebrated by the Jewish faith. These include:

- **Sabbath (Shabbat)**. Begins at sundown on Friday and ends at sundown on Saturday. It is a day of rest and spiritual enrichment, and food must not be prepared on the Sabbath.
- **New Year**. Ten solemn, holy days, from Rosh Hashanah (Day of Judgement) to Yom Kippur (Day of Atonement – a day of fasting). This occurs in September or October.
- **Festival of Pesach (Passover)**. This lasts for eight days, during which time no leavened bread or flour is allowed.
- **Sukkot (Tabernacles)**. This is a nine-day festival. During the first eight days, meals are eaten in outdoor huts with covers made of palm branches called 'Sukkahs'.
- **Chanukah**. This is an eight-day festival. It is customary to eat oily foods such as doughnuts and latkes (potato pancakes).

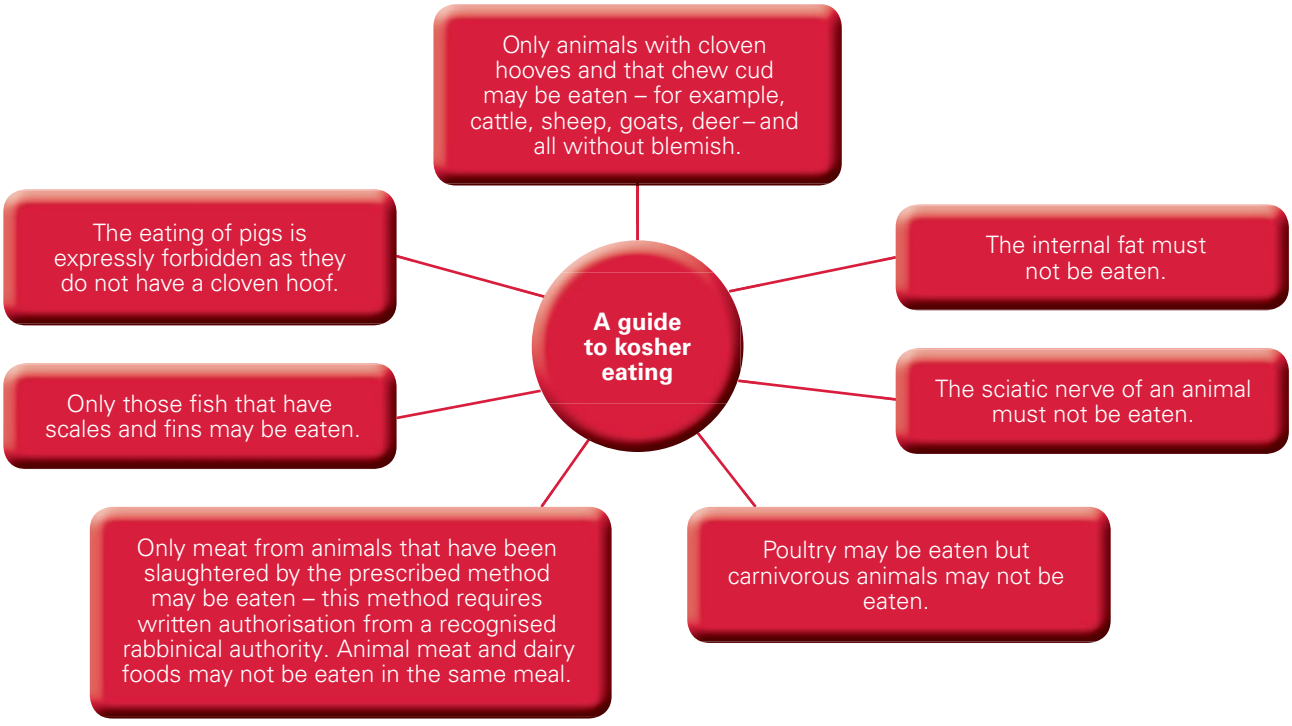

Figure 11.14 A guide to kosher eating.

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Figure 11.16 Every Friday at sunset, Jewish families around the world start their observance of the Sabbath (Shabbat). A part of the ritual is the breaking of a special bread, called Challah.

DESIGN THINKING

Food plays an important role in the Jewish religion. There are many traditional food products that are consumed during special religious observances. Research and produce a traditional Jewish meal.

Islam

Islam contains a range of different food customs, which depend very much on local cultures. In Islam, eating is considered a matter of worship. An individual is to eat for survival and good health – self-indulgence is not permitted. Food is to be shared and is not to be thrown away or wasted. Dietary restrictions are very similar to Jewish law with the **prohibition** of pork, carnivorous animals and blood. **Halal** animals such as cattle, goats and so on must be slaughtered according to Islamic rites.

Ramadan, which occurs in the ninth lunar month of each year, is the holiest month in the Islamic calendar. Fasting is prescribed in this month. It is a month in which the holy Qur'an was **revealed**. It requires complete abstinence from food and water from sunrise to sunset for one month.

prohibition The act or process of not permitting the consumption of a food, often due to personally held beliefs.

halal An Arabic word meaning 'lawful' or 'permitted'.

revelation A way of showing what is believed to be the truth.

Figure 11.17 This label indicates to Muslim people that the food has been prepared according to halal rules.

Figure 11.18 During Ramadan, Muslims break the daily fast by eating date palms.

11.15 LET'S COLLABORATE

There are a number of holy days and festivals celebrated by the Islamic faith, such as:

- Eid al-Fitr Ramadan, the month of fasting, which ends with the festival of Eid al-Fitr. This literally means the 'Festival of Breaking the Fast'. A sense of generosity and gratitude colours these festivities. As the month draws to a close, Muslims are obligated to share their blessings by feeding the poor and making contributions to mosques.
- Mawlid al-Nabi, a holiday that celebrates the birthday of Muhammad, the founder of Islam.

Research another festival on the internet and write a short report on it.

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Hinduism

The Hindu **caste system** determines the social structure within the Hindu faith, including foods to be eaten. Most deeply religious Hindus are vegetarian; this is due to the fact that they believe in non-violence against all life forms. Some Hindus do not eat eggs, and most Hindus will not consume beef as the cow is considered sacred and is deeply respected. Some people, especially those of the lower castes, will eat pork and chicken. Milk and **ghee** are sacred because they are products of the sacred cow.

caste system A way of dividing Hindu society into different classes.

ghee Butter that has had the impurities removed or been clarified.

Coconut, which is used as an offering at temples, is also sacred, as the three 'eyes' of the coconut represent the three eyes of Shiva. Other forbidden foods include the domestic fowl, salted pork, onions, garlic, turnips and mushrooms. Some Hindus also avoid red foods such as tomatoes and red capsicum because of their association with blood.

Figure 11.19 As many people in India belong to the Hindu faith, cows freely roam city streets.

Buddhism

Buddhists vow to abstain from killing or otherwise injuring living creatures; however, some Buddhists do eat meat and many eat fish.

Buddhist monks may fast twice a month, on a new moon and full moon, and most monks do not eat after noon.

Figure 11.20 Offering food is one of the oldest rituals of Buddhism. In countries like Thailand, monks still rely on receiving food from believers.

11.16 INVESTIGATE IT

Did you know that the orange robes worn by Buddhist monks are dyed using the spice saffron? Find out more about Buddhists from the About Buddhism website.

DESIGN BRIEF: BUDDHIST CUISINE

You have been asked to prepare a meal for a group of Buddhist monks who are visiting your school. Work in teams to plan for a two-course meal and an Aussie 'treat' that they can take home. Generate a list of foods eaten by Buddhist monks and then decide as a team which ones are suitable for the school visit. Prepare the meal and ask your fellow class members to critically evaluate it.

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REFLECT ON LEARNING

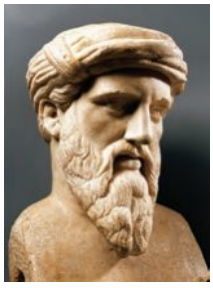
1. Develop a list of social factors that can influence a person's food choices.
2. Explain how a young person's peers can influence their food choices.
3. Supermarkets are getting bigger and bigger. Discuss the impact culture has played in supermarket growth.
4. Outline the role of religion in food choice and family meal patterns.
5. List four religious observances that have special foods as part of their celebrations.

11.4 Ethical influences: Vegetarianism

Another set of eating patterns based on strongly held beliefs is vegetarianism. It is thought that Christian groups led the initial vegetarian movement in Western culture. Members believed that Christ's teachings of mercy should be extended to animals as well as to people. They also believed that a vegetarian diet was healthier than one based on meat and that Christians had a duty to maintain good health in order to do God's work.

Tasty Trivia

The Greek mathematician Pythagoras was a vegetarian – in fact, vegetarians were called Pythagoreans up until the 1800s.



Today, vegetarians hold many varied ethical and personal beliefs. Individuals become vegetarians for many different reasons, such as an awareness of the importance of diet in maintaining health, an interest in Eastern philosophy and religion, and a concern about killing or mistreating animals or the **degradation** of the environment.

degradation Deterioration or a decline in the quality of life.

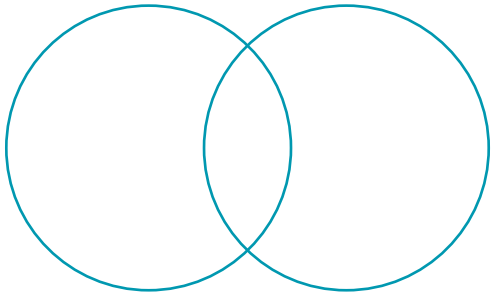
Some people who call themselves vegetarians are actually semi-vegetarians. They may have eliminated red meat because they dislike the taste or for health reasons, but they may still choose to eat fish and/or poultry.

Not all vegetarian diets are alike. Figure 11.21 on p.304 shows the differences in what some major vegetarian categories include.

11.17 ACTIVITY

Comparisons = similarities + differences

Complete a Venn diagram to compare two different categories of vegetarianism. Use this diagram to show the similarities and differences in what the two types of vegetarians do and do not eat.



DESIGN BRIEF: VEGETARIAN HOT POT

Prepare a vegetable recipe for a non-vegetarian that is interesting, looks good, tastes good and that your peers would want to eat. This no-meat meal will also be economical. Most importantly, as there is no meat, the dish still needs to contain some protein. The protein needs to be provided through a combination of cereal foods, legumes and vegetables. Alter the vegetarian hot pot recipe in order to satisfy the requirements of the brief.

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Vegetarian hot pot

Main tools and equipment

Knife, measuring spoons, measuring jug, saucepan

Production skills

Peeling, chopping, dicing

Cooking processes

Sautéing, boiling, simmering

SERVES 2

Preparation time: 25 minutes

Cooking time: 17 minutes

Serving and presentation time: 5 minutes

Total time: 47 minutes

Ingredients

 1 tablespoons olive oil	 1 clove garlic, crushed	 ½ onion, peeled and chopped	 ½ teaspoon cumin	 ½ teaspoon coriander	 ½ teaspoon ginger
 ½ teaspoon turmeric	 2 vegetable stock cubes, crumbled	 1 cup water, boiled	150 g pumpkin, peeled and diced	150 g peeled and diced potato	
 50 g green beans, washed	 220 g canned tomatoes	 75 g red lentils			

Method

1. Sauté oil, garlic and onion for 2 minutes in a large saucepan.
2. Add cumin, coriander, ginger and turmeric to the saucepan. Cook until fragrant.
3. Dissolve the stock cube in the water and pour into the saucepan.
4. Add all the other ingredients and bring to the boil.
5. Cover and simmer slowly for 15 minutes until vegetables are soft.
6. Serve.

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Vegetarian hot pot – continued

Evaluating

1 Develop three criteria for success from the brief.

2 Use these criteria to critically evaluate the vegetarian dish that you have prepared. In your evaluation, be sure to consider sensory properties.

3 Develop a list of five other cereal, vegetable or legume options that can be used in this recipe.

4 Suggest an ingredient list for a lacto vegetarian.

	Eggs	Dairy	Meat	Plant sources
				
Ovo vegetarian	✓	x	x	✓
Lacto vegetarian	X	✓	x	✓
Lacto-ovo vegetarian	✓	✓	x	✓
Vegan	x	x	x	✓

Figure 11.21 Different categories of vegetarian diet

11.18 ACTIVITY

How healthy is a vegetarian diet?

Refer back to Chapter 4, which looks at nutrients, and develop a list of nutrients that might be missing from the diet as a result of a person becoming:

1 an ovo vegetarian

2 a lacto-ovo vegetarian

3 a lacto vegetarian

4 a vegan.

Make appropriate suggestions of foods to include in their everyday food consumption to ensure nutritional balance.

11.5 Sustainable influences

Farmers face almost impossible expectations from consumers – they have to produce more food and do so faster while simultaneously reducing the size of their environmental footprint!

Access to foods

Food access can affect your food choices in a number of ways, and availability can differ for many people. Availability of food may be due to what is in season; the takeaway food shops where you live; your nearest supermarket and other food services such as baker or butcher; and your ability to access these food resources because of transport. Many people have difficulty accessing food supplies, as they may have a disability, they may lack transport or do not have access to public transport, or their location may cause a problem.

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rural Describes an area determined by a population size of 25 000–99 000 people (large rural) or 10 000–24 000 people (small rural).

remote Describes an area determined by a population size of fewer than 5000 people.

People who live in **rural** or **remote** areas may have great access to the fresh foods that are produced in their area, but may not have access to other fresh foods as it can be difficult and costly to deliver these food products to food stores. In some cases, nutritious foods may not be available to purchase. Think about what you can buy from a service station. Often, the foods available are energy-dense products and, as these are easy to access, these types of products may be what is purchased.

11.19 LET'S COLLABORATE

Think about your access to food products. Suggest the different groups that may experience difficulties with food security and access to food in Australia. Outline why. Suggest possible solutions to improve access to food.

Seasonal foods

There are a number of food items that are **seasonal**. These include fruits, vegetables and some meats like lamb and veal. Understanding when certain foods are in season can assist in meal planning and also help to keep food costs down. Foods that are out of season always cost a lot more. Why do you think this might be the case? Season also impacts food choice, as there are times of the year when you may not be able to consume your favourite fruit and will need to find an alternative product.

seasonal Describes a type of food that is at its best or in abundance at a certain time of the year, determined by the weather.

Globalisation and effective transportation have reduced the influence of season on products available in the supermarket. You can purchase most foods all year round, thanks to their importation and transportation from wherever they are in season. Transporting food around the world does have an impact on our environment, however, particularly the amounts of carbon pollution created through transport by air.

globalisation The connectedness of the world.

food miles The distance food products travel from where they are produced to where they are purchased and consumed.

The distance that food travels from where it is produced to where it is purchased is known as **food miles**. Foods that are out of season and available to consumers may have travelled great distances to be available. However, in other circumstances, some foods can only be grown in another location and must be transported for production and purchase; thus importing this product might be best for the environment.

11.20 LET'S COLLABORATE

Not every food item is grown in Australia. Can you think of any foods that are grown overseas and for which we really do not have the best growing conditions? Look at the images below to provide a start.

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11.21 ACTIVITY

What's in season?

1 Find 10 different food items that are available for each season: summer, autumn, winter and spring. You must include a variety of products, not all from the same food group. You could use the following websites to help you:
   - Market Fresh
   - Meat and Livestock Australia
   - Sydney Fish Market.

2 Produce a poster, podcast or Comic Life that illustrates each of the seasons and include information on what is fresh and available at that time of year.

3 Design a meal that promotes one of your seasonal ingredients as the hero.

Figure 11.22 A collection of summer fruits – grapes, watermelon, kiwifruit, pear, oranges, lemon, bananas

Figure 11.23 A collection of winter fruits – oranges, tangerines, cumquat, lemons

CREATE A SOLUTION

Using food in season

You are off to a friend's house for dinner and need to bring dessert. Your friend loves fruit so you were thinking maybe a cherry pie or crumble, but when you get to the supermarket you realise that they are too expensive and you can't afford to buy the amount you need with the money you have. Realising that your budget is limited, reflect on the current season and design a fruit pie or crumble dish that can be made cheaply with ingredients grown in Australia – even locally, if possible – to use in your dessert.

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11.22 ACTIVITY

Product availability

1. Identify your favourite seasonal product.
2. Explain why lamb is a seasonal food product.
3. Do some research online and define the term 'food miles'.
4. When you visit the supermarket, you often see fruits like cherries available out of season. Explain why it is possible to purchase some foods when they are not being harvested in Australia.
5. Explain the impacts on either the product or the consumer of buying products out of season.
6. Describe the impacts on the environment of buying products out of season.
7. Suggest why supermarkets sell out-of-season produce.

11.23 INVESTIGATE IT

There has been much discussion about the growing of rice in Australia.

1. Research rice-production farming practices.
2. Identify where in Australia rice is grown.
3. Identify where in the world rice is grown.
4. Discuss the reasons why you believe there has been environmental concern related to the farming of rice in Australia.
5. Should we grow locally or import? Justify your opinion.

Tasty Trivia

In wealthier countries, cost is the second most important influence on personal food choice. (Sensory is first.) In less well-off countries, cost is the most important factor.

11.24 ACTIVITY

Interview

Conduct an interview with an adult who is aged 60 or older. Ask them the following questions:

1. Name your favourite foods when you were an adolescent.
2. Explain what foods were a special treat and why this was so.
3. Were most of the foods you consumed homemade?
4. How often did you eat takeaway foods and what were they?
5. Explain how food availability affected what you were eating.
6. Could you purchase food items such as cherries or lamb out of season? Explain why.
7. Can you remember any new and exciting foods that became available when you were a teenager? What were they?
8. Now write down your responses to these questions.
9. Write a concluding paragraph that summarises the information you have learnt and that compares food consumption then with food consumption now.

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Farmers' markets

Farmers' markets have become very popular in Australia. They are held in both city and country locations. A farmers' market is usually held outdoors and is a place where farmers sell their fresh produce directly to the public, rather than through shops or supermarkets. The market operates regularly in the community and offers consumers fresh produce 'picked yesterday, sold today'. Prices are often cheaper because the farmer is selling directly to the public.

Figure 11.24 Many customers like to meet the people who produced their food.

11.25 INVESTIGATE IT

To find your local farmers' market, check out the Australian Farmers' Market Association website and respond to the following questions:

1. When is the next market being held?
2. Where is it located?
3. Have you ever been? If not, check it out.

11.26 ACTIVITY

What's the cost?

Visit your local supermarket and answer the following questions. (Alternatively, you could go 'virtual' shopping at the Coles Online website.)

1. Identify how much it costs to buy a kilo of fresh green beans.
2. Identify how much it costs to buy a tin of green beans. Record the weight of the tinned beans.
3. Identify how much it costs to buy a packet of frozen beans. Record the weight of the frozen beans.
4. Comparing the price with quantity, identify which product is the best value for money.
5. Choose a barbecue chicken. Find out what size the chicken is and how much it costs to purchase.
6. Now find an uncooked chicken of the same size in the meat section of the supermarket. Record how much this chicken costs.
7. Name which chicken is the best value for money.
8. Investigate how much it costs for a litre of plain milk.
9. Investigate how much it costs for a litre of skim milk.
10. Investigate how much it costs for a litre of milk with added nutrients.
11. Investigate how much it costs for a litre of flavoured milk.
12. Determine which milk is most expensive. Explain why you think this is the case.
13. Determine which milk is the cheapest to purchase. Explain why you think this is the case.
14. Write a summary on what you have discovered from your visit to the supermarket. As you write this summary, reflect on why it is more economical to purchase fresh foods and prepare them from scratch than it is to purchase pre-prepared convenience foods.

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Organic farming

Organic farming involves the growing, production and processing of foods without the use of chemicals (fertilisers, pesticides, herbicides or antibiotics). It is also about the humane treatment of animals. Organic farming methods are concerned with lessening the impact of farming on the environment. Many organic farmers use traditional farming methods such as crop rotation, which helps to prevent the depletion of nutrients in the soil.

Organic farming
Farming practices that produce foods without the use of chemicals.

Figure 11.25 When farmers do not use harmful chemicals on their crops, they have to think of alternative ways to control pests. Why do you think geese are patrolling this vineyard in the Limestone Coast region of South Australia?

11.27 LET'S COLLABORATE

Organic farming is concerned with protecting the environment. Discuss the ways by which this approach to food production is protecting and preserving our ecosystems.

11.28 ACTIVITY

Taste the difference

Compare the difference between an organic and non-organic food product such as a banana or chocolate.

Copy and complete the table comparing the two products, then answer the questions that follow.

Product	Appearance	Aroma	Taste	Mouthfeel	Cost per 100g
Organic					
Non-organic					

1. State which product had the best overall taste.
2. State which product had the best appearance.
3. Discuss which product was the most expensive and why.
4. List the benefits of organic farming for producers.
5. List the benefits of organic farming for consumers.
6. List two disadvantages of organic farming for producers.
7. List two disadvantages of organic farming for consumers.
8. Outline which product you preferred overall. Justify your response.

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Moroccan lamb sausage rolls

MOROCCO

RECIPE

Main tools and equipment

Bowl, oven tray, wooden spoon, measuring cup, measuring spoons, pastry brush

Production skills

Dicing, chopping, folding

Cooking processes

Baking

SERVES 2

Preparation time: 20 minutes

Cooking time: 20 minutes

Serving and presentation time: 5 minutes

Total time: 45 minutes

Ingredients

 2 sheets frozen puff pastry	 250 g organic lamb mince	 2 organic lamb sausages, meat squeezed out into a bowl	 2 cloves garlic, minced	 ½ onion, diced	 ¼ cup parsley, finely chopped
 2 tablespoons coriander	 ½ teaspoon ground ginger	 ½ teaspoon ground cumin	½ teaspoon sea salt	Pinch ground black pepper	
 ½ tablespoon olive oil	 1 egg, beaten for brushing + 1 egg for meat mixture	 Sesame seeds	Tomato sauce or Thai sweet chilli sauce (to serve)		

Method

1. Thaw the puff pastry and set the oven to 175°C.
2. Line a baking tray with greased paper.
3. In a large bowl, mix together the ground lamb and meat from the sausages.
4. Add the garlic, onion, parsley and coriander to the meat and mix well.
5. Add the ginger, cumin, and salt and pepper. Mix again.

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6 Add the mixture to a blender or food processor and add the olive oil and egg. Blend until the mixture becomes relatively smooth.

7 Meanwhile, cut the pastry into rectangles and brush one edge with beaten egg.

8 Put some sausage mixture into the middle of the pastry.

9 Fold the pastry over and seal it carefully. Lift the whole thing up and turn it over so that the sealed edge is underneath.

10 Cut off the ends of the sausage roll to ensure that it is neat and that meat isn't falling out. Repeat the process.

11 Brush the tops of the sausage rolls with beaten egg and then sprinkle on sesame seeds.

12 Place the rolls on the lined baking tray and bake for 20–25 minutes or until golden brown.

13 Serve with tomato sauce or Thai sweet chilli sauce.

Evaluating

Think about the sensory properties of food of your Moroccan Lamb Sausage Rolls. Complete a strengths, weaknesses, opportunities and threats (SWOT) analysis of this recipe. Be sure to think about the taste, texture, appearance, aroma and sound of the ingredient before cooking, and the food product once it has been cooked.

Strengths	Weaknesses
Opportunities	Threats

Animal welfare

The treatment of animals in farming and food production is an ethical food issue. You learnt about pork production in Chapter 7 and about egg production and the treatment of hens in Chapter 8. Yet there are many other animal welfare considerations, such as the use of growth hormones, steroids and the ways in which animals are kept, such as the use of feed lots.

11.29 LET'S COLLABORATE

Do you ever consider where your food comes from? Should you?

11.30 INVESTIGATE IT

1 Research an animal welfare issue.
2 Explain why this is an ethical issue.
3 Discuss the reasons for this farming practice.
4 Discuss the reasons why the farming practice should change.
5 Describe the impact of this issue on food production.
6 Present your findings to your class.

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Food waste

Food waste is costing Australians billions of dollars – we waste more than $5.2 billion worth of food each year. That's around $620 for each Australian household.

About 60 per cent of Australia's waste goes straight into **landfill**, which is having a direct impact on our environment. The greenhouse gas methane is produced when food decomposes. This gas has significantly more impact on the environment than carbon.

landfill A tip or rubbish dump where waste is sent.

Figure 11.26 Carrots dumped on a farm in Tasmania

11.31 LET'S COLLABORATE

It isn't just food waste that is contributing to landfill and impacting our environment. List other food-related waste items.

11.32 ACTIVITY

How can I help to reduce food waste?

There are many ways in which consumers can reduce food and food product waste.

1. Outline the reasons why it is important to reduce waste for our environment.
2. List the different strategies consumers can use to reduce their waste.
3. Using Comic Life or another interactive web tool, design an information sheet showing the different waste-reduction strategies.

DESIGN THINKING

A sandwich like the Bánh mì on p.313 is a great way to use up any leftover food and reduce waste. Design a recipe that you can use to finish up the leftover ingredients in the fridge rather than throw them out. You will need to consider what the main part of your food product is, such as the bread in the sandwich, and then provide a list of suggested ingredients that could be incorporated or adapted into the recipe. Think about asking the person who cooks at home if they have a 'go to' food item that uses up any leftover foods from the fridge.

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Bánh mì

VIETNAM

Main tools and equipment

Vegetable peeler, frying pan, measuring spoons

Production skills

Chopping, marinating

Cooking methods

Frying

SERVES 2

Preparation time: 20 minutes

Cooking time: 5–10 minutes

Serving and presentation time: 5 minutes

Total time: 30–35 minutes

Ingredients

 ⅓ Lebanese cucumber	 ½ carrot	 2 teaspoons sesame oil	 1 tablespoon soy sauce	 1 clove garlic, finely chopped	 1 tablespoon sweet chilli sauce
 1 chicken breast, cut into strips	 2 teaspoons vegetable oil	 2 baguettes or long rolls	 1 tablespoon mayonnaise	 2 Cos lettuce leaves	 Handful of coriander sprigs

Method

1. Use a vegetable peeler to peel the cucumber and carrot into long strips.
2. Combine sesame oil, soy sauce, garlic and sweet chilli sauce. Coat the chicken in the sauces and leave to marinate for 10–15 minutes.
3. Heat oil in frying pan, drain the chicken and cook.
4. Split the baguettes and spread with mayonnaise. Fill with lettuce, chicken, carrot, cucumber and coriander.
5. Serve.

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REFLECT ON LEARNING

1. Define the term 'ethics'.
2. Describe how where you live affects what you eat.
3. Identify what types of foods are seasonal.
4. List the different categories of vegetarians and describe the foods that they consume.
5. What is a farmers' market? Identify whether you have one in your local area.

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LOOKING BACK

1 There are a number of factors that influence a person's food choices. These include social, cultural and ethical influences.

2 There are a variety of different religions and beliefs that influence food choice. Each has its own food requirements and celebrations that incorporate food.

3 More and more consumers are demanding ethical and sustainable food choices.

4 Environmental food issues include food waste, farming practices including organic farming and food miles.

5 Ethical food issues include the humane treatment of animals.

TEST YOUR KNOWLEDGE

Multiple choice

1 A group of students visit the school canteen. Is it likely that:

- **a** they will all choose the same or similar foods to eat
- **b** they will all choose something different
- **c** they will all choose something based on their religious or cultural beliefs
- **d** they will all choose not to eat that day.

2 Organic farming is described as:

- **a** farming practices that produce foods with the use of chemicals
- **b** farming practices that produce foods with the use of environmental intervention
- **c** farming practices that produce foods without the use of chemicals
- **d** farming practices that produce food in a way consumers like.

True/false

1 All foods are available year round.

2 There are a number of different categories of vegetarianism. One of these is octogenarian.

3 There is no problem with throwing leftover food straight into the rubbish bin.

Short answer

1 List the reasons for the increasing number of farmers' markets across Australia.

2 Suggest reasons why people are purchasing their food from these farmers' markets.

3 Outline the reasons why people are choosing not to consume meat products.

4 Explain the impact of food miles on the environment. Suggest why we have foods that travel long distances.

5 Briefly discuss all the factors affecting food choices.

Extended response

Class debate: working in teams, with one side at the affirmative and the other as the negative, debate any of the following statements:

- Fresh is best.
- Everyone should only eat a vegetarian diet.
- At the end of the day, I am responsible for what I eat.
- We should not import foods that are out of season.

You will need to research your topic and provide examples to support your point of view. Present your arguments to the rest of the class and vote on who has presented the best argument.

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Glossary

aged Describes the meat of a slaughtered animal that is left to hang for a period of time to increase its tenderness.

al dente Cooked 'to the tooth' – not too soft, but chewy with some bite or texture to it.

anaphylaxis An extreme allergic reaction to a food product.

antioxidant A substance, such as vitamin C or E, thought to help fight free radicals in the body that can cause disease.

appearance The 'look' of the product, packaging or food.

aquatic relating to water

aroma The smell arising from the food.

bacteria Single-celled micro-organisms responsible for decay, fermentation and ultimately spoilage of food.

bake To cook in an oven with currents of hot air surrounding the food.

bantam A breed of chicken that is small and produces much smaller eggs.

boil To cook in water or liquid with the water bubbling above 100°C.

botanical Relating to plants and/or plant life.

boutique Describes a very specialised product that is usually produced in small quantities.

bran The protective outer layer of the grain.

burn Damage caused to the skin by something hot.

butter A dairy product that is produced by churning milk or cream until the fat solidifies and forms a spread.

buttermilk The liquid that remains after butter is made from cream. It has a tangy, almost sour, taste and is used to make muffins, pancakes and some breads.

carcass The slaughtered body of an animal killed for its meat.

cardiovascular disease A class of disease that affects the heart and blood vessels.

caste system A way of dividing Hindu society into different classes.

cereals Grains used for food, such as wheat and maize.

chemical properties Include all natural chemical parts of food, such as nutrients, acids, alkalis and enzymes; in processed food, they include additives.

cholesterol A waxy, fat-like substance used by the body to build cell walls. It is either produced in the liver or absorbed from animal fats eaten. It is necessary for good health; however, excess levels are detrimental.

coagulation The changing of a protein from a liquid to a solid when heated or agitated.

collaborating Working and communicating well with others within a team environment.

collagen A long, stiff protein that is made up of three separate molecules composed of amino acid chains, twisted around each other. The more collagen there is in a piece of meat, the tougher it is to chew and eat.

complete protein food A food that contains all nine essential amino acids.

compote Fruit stewed or cooked in a syrup, usually served as a dessert.

conduction Cooking food by heat transference through a flat metal surface onto the food or liquid – for example, frying, poaching or grilling.

conductor A good conductor of heat – for example, copper, stainless steel and enamel – allows the heat to travel through it quickly. Wood and glass are poor conductors of heat, which is why wooden spoons are best for stirring hot food.

confit Different foods that have been cooked in oil or syrup, then sealed and stored.

contaminated Unsafe to eat due to contact with chemicals, foreign objects or bacteria that are harmful for people to eat.

convection Cooking food by the circulation of hot air or steam, such as in an oven or a steamer.

criteria for success Questions developed to check whether you have made something to meet the requirements of the design brief. The criteria for success should come out of the design brief.

cross-pollination The transfer of pollen from one plant to another.

crustacean A hard-shelled invertebrate animal.

cultivate To prepare the land and soil for the growing of crops and cereal grains.

cultural factors The beliefs, customs and practices of a particular group of people that influence food choice.

culture Beliefs, customs, traditions and social practices of a group of people.

cultured Grown or propagated in an artificial medium.

curds The solids in milk, formed when the protein has coagulated after the addition of rennet or lactic acid.

degradation Deterioration or a decline in the quality of life.

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descriptive words Words used to describe characteristics of food – for example, for appearance, translucent, watery, colourful, bright red; for texture, crunchy, crisp.

design An activity that translates an idea into something useful, making it better and improving quality of life; it fulfils a need.

design brief A concise statement clarifying the project task and defining the need or opportunity to be resolved after some analysis, investigation and research. It usually identifies the users, criteria for success, constraints, available resources and timeframe for the project, and may include some possible consequences and impacts.

design plan The plan you will follow to make the food product.

design process A process that typically involves investigating, generating, producing, evaluating, planning and managing to create a design solution that considers social, cultural and environmental factors.

design thinking Use of strategies for understanding design problems and opportunities, visualising and generating creative and innovative ideas, and analysing and evaluating those ideas that best meet the criteria for success and planning.

designed solutions The products, services or environments that have been created for a specific purpose or intention as a result of design thinking, design processes and production processes.

diet-related diseases Illnesses linked to quality of food consumption – for example, cardiovascular disease, colorectal cancer and constipation.

dry heat Any cooking technique where the heat is transferred to the food without moisture. Dry heat cooking involves high temperatures.

efficient Performing in an organised and optimal manner.

electricity The flow of electric power or charge.

endosperm The main part of the grain.

essential fatty acids (EFA) 'Good' fats; the body does not produce these, so they must be consumed from food. Examples of foods that supply EFA are nuts, avocado and fish.

ethics The science about how we should live or attempt to live. Behaviours and decisions that reflect right or wrong.

evaluating and analysing The process used to assess how successful the solution to the challenge is and how the design process can be improved in the future.

exclusion Preventing someone from eating a certain food.

external Describes factors that influence food choices that are outside a person – for example, advertising and the media.

family A group of related people, including parents, children and grandparents.

fats Compounds, usually derived from an animal source, that are solid at room temperature and liquid when heated – for example, butter.

fat-soluble vitamins Vitamins (A, D, E and K) that are not soluble in water and that need to be stored in the body in either the liver or fatty tissues. They are transported around the body by special proteins.

food A substance, composed primarily of carbohydrates, fats, water and/or proteins, that is a source of nutrients consumed by humans and animals. Food is required for growth and energy.

food miles The distance food products travel from where they are produced to where they are purchased and consumed.

free-range chickens Birds are allowed to roam freely outside during the day, but roost in sheds at night.

from scratch Prepared from fresh ingredients, without the use of anything pre-cooked or packaged.

fructose The sugar found in fruit.

fruits The edible parts of a plant that contain the seeds of the plant and are attached to the plant by a stem or stalk.

functional properties What the ingredients of food actually do when the food is prepared and/or cooked – for example, an egg will set when it is heated, so this makes it useful to thicken sauces.

generating Developing and creating a number of ideas or solutions.

ghee Butter that has had the impurities removed or been clarified.

globalisation The connectedness of the world.

glucose unit A sugar energy source produced in plant products.

gluten A mixture of two different types of protein found in cereal grains.

glycaemic index (GI) The ranking of carbohydrates according to their effect on our blood glucose levels.

'good' fats Fats that tend to lower cholesterol levels when they replace saturated fats in the diet, thus reducing the risk of heart disease.

halal An Arabic word meaning 'lawful' or 'permitted'.

health claims General health claims describe a relationship between the consumption of a food, or a component in the food, and a health benefit. High-level health claims describe the function of a food, nutrient or other substance in relation to a serious disease – for example, heart disease. High-level health claims must have approval from Food Standards Australia and New Zealand.

herbs The leaves of plants, used to season food.

homogenisation The process used to break down the fat particles in milk to a smaller size.

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hybrid An object that combines two different elements.

hydrolysis A chemical reaction with water that causes decomposition of the muscle fibres.

hygiene The practice of cleanliness in order to preserve health and prevent the spread of disease.

incomplete protein food Usually from plant sources that lack one or more essential amino acids.

internal Describes factors that influence food choices of people – for example, family and culture.

investigating The problem is developed as a result of critiquing needs or investigating opportunities of designed solutions.

key foods The main food groups – cereals; fruits and vegetables; meat, poultry and seafood; nuts and legumes; dairy and dairy products, eggs; fats and oils.

kilojoule Unit used to express the energy or fuel value of food.

kosher Food that has been prepared so that it is fit to eat under the food requirements of the Jewish religion.

lacto-ovo vegetarian A type of vegetarian who eats dairy and egg products but no meat.

lactose intolerant Unable to digest lactose (milk sugar), such as that found in milk and cheese.

land degradation Deterioration of the quality of the land until it is no longer able to be used.

landfill A tip or rubbish dump where waste is sent.

lean meat Meat with the least amount of fat possible.

leavening A raising agent that is added to cereal products like bread to make them rise.

legumes The seeds from some pod-bearing plants.

lifespan The length of time that a person can be expected to live and the stages through which they will progress – for example, infancy and adolescence.

lipids Substances that are insoluble in water, such as fat and oil.

livestock Breeds of animals that are regarded as an asset.

mandatory Something that is compulsory.

meat The flesh of an animal that is edible.

micro-organism A tiny single-celled organism that is only visible under a microscope. Three types connected with food are yeast, moulds and bacteria.

milling The process that makes cereal grains into flour or meal.

moderate temperatures 160 to 180°C.

moist heat Any cooking technique that involves cooking with moisture: steam, water, stock, wine or some other liquid. Generally, low temperatures are used.

mouthfeel How food or drink feels in the mouth – the sensory evaluation of impressions on the palate.

nomadic Describes people of no fixed abode who move according to the seasons from place to place in search of food and water.

nutrients The chemical compounds found in food that are used by the body to enable it to function and grow.

nutrition The science that studies the interaction between our bodies and food.

nutrition content claims Statements made by a manufacturer about the amount of a nutrient, energy or a biologically active substance in the food.

nuts Edible kernels in a hard shell.

oils Compounds, often derived from a plant source – for example, nuts and seeds – that are liquid at room temperature.

omega-3 fatty acids Long-chain polyunsaturated fats that have health benefits.

organic Food that is grown and/or produced without synthetic chemicals – for example, no weed killers or sprays to kill insects, moulds or fungus.

organic farming Farming practices that produce foods without the use of chemicals.

oxidation The combining of a substance with oxygen.

palatable Having a good taste or mouthfeel when eaten.

parasite A plant or animal that lives in or on another plant or animal.

pasteurisation A process in which milk is heated to a temperature just below boiling point and held at that temperature to kill micro-organisms. The milk is not boiled as this would also destroy nutrients.

peer group A social group of people who are equal in terms of age.

perishable Subject to decay.

physical properties The individual characteristics of food, such as size, shape and colour.

phytochemicals Chemicals found in plants that can help to prevent disease.

producing Actively realising (making) the designed solutions using appropriate resources and means of production.

product One of the outputs of the design and production processes. Products are the tangible end results of natural, human, mechanical, manufacturing, electronic or digital processes to meet a need or want.

production processes The steps used to produce a product.

prohibition The act or process of not permitting the consumption of a food, often due to personally held beliefs.

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project management The responsibility for planning, organising, controlling resources, monitoring timelines and activities, and completing a project to achieve a goal that meets identified criteria for judging success.

prototype A trial item made to test an idea or process in order to inform further design development.

pulses Dried legumes.

purée To blend, process, sieve, mash and/or strain cooked food to the consistency of a soft paste or thick liquid.

quail Small, plump, wild bird in the pheasant family; popular for roasting.

radiation Cooking food by direct heat from a flame or element, such as in a griller, or when electromagnetic waves pass through food, such as in a microwave.

rancid Describes a stale smell and flavour in fats and oils.

refined When the composition of the cereal grain is altered, the bran is often removed to make the cereal grain easier to use.

regulation The control of a process to ensure that it functions correctly.

religion A strongly held set of beliefs, values or attitudes by which someone lives.

remote Describes an area determined by a population size of fewer than 5000 people.

rennet Made from rennin, an enzyme used for clotting milk. It occurs naturally in the stomach lining of mammals. It coagulates or clots the protein in milk, making it easier to digest.

resource Something you use to achieve what you want to do. For example, in food preparation this could be money, time, available food and your skills.

revelation A way of showing what is believed to be the truth.

rural Describes an area determined by a population size of 25 000–99 000 people (large rural) or 10 000–24 000 people (small rural).

salmonella A bacterium that causes food poisoning.

salt Sodium chloride.

saturated fats 'Bad' fats that clog our arteries, such as those found in animal products like full-fat dairy items and fatty meat, as well as some plant-based sources.

scald Burn from hot liquid or steam.

seasonal Describes a type of food that is at its best or in abundance at a certain time of the year, determined by the weather.

seeds The flowers or fruits of plants such as the poppy.

sensory properties The characteristics or properties of food that are detected by the five senses: smell, touch, taste, hearing and sight.

serrated A serrated knife has a jagged, saw-like edge; it is usually used for bread but is also good for cutting tomatoes.

Seventh-Day Adventists A Christian denomination distinguished by its observance of Saturday as the Sabbath.

shellfish An invertebrate water animal that has a shell.

shred To cut finely into long, thin strips; a term used for leaf vegetables – for example, to shred lettuce, cabbage or spinach leaves.

slaughter The killing of an animal for its meat.

slice To cut through with a knife.

social factors The factors influencing food choice that are related to the interaction of people.

specifications Constraints and considerations or issues that will need to be thought about when you come up with a solution.

spices The dried seeds, buds, fruits, bark or roots of plants, used to season food.

staple food source A food that is eaten regularly and in large quantities. It is the most eaten product in the diet.

starch A carbohydrate made in plants that provides energy to the human body.

starter A culture that starts the process of coagulation of the protein.

subjective A view about food that is based on opinion rather than facts – for example, based on taste, look, smell and feel.

sucrose A complex carbohydrate found in many plants and used as a sweetening agent.

sugar An energy-dense carbohydrate mainly made of sucrose.

sustainability Meeting the needs of the present without compromising the ability of future generations to meet their own needs.

taste The sense that perceives the flavour or savour of things using the mouth and tongue.

totem A totemic being represents the original form of an animal, plant or other object (totem), as it was in the Creation period.

ultra heat treated (UHT) Milk that is heated to a very high temperature for a short time, which means that it does not need to be refrigerated and has a long shelf life.

umami The savoury flavour or taste sensation of food.

unsaturated fats 'Good' fats that can help to reduce cholesterol levels. They are divided into monounsaturated fats and polyunsaturated fats.

vegan A person who does not eat or use any animal products and eats only plant foods.

vegetables The edible parts of a plant. There are many different vegetables, and we eat different parts of the plant.

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vegetarian Generally, a person who eats eggs and dairy products, but does not eat any animal flesh (this type of vegetarian is called lacto-ovo).

vertebrates Animals or fish with a backbone.

viruses Microscopic parasites that are food or water borne. They cause viral infections that result in illness in humans.

whey The liquid in milk, left when cheese is made.

whole milk Milk from which no constituent, such as fat, has been removed.

wholegrain The fibre-rich outer coating of bran, the central endosperm and the nutrient-packed inner germ of the grain.

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