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FOOD SOLUTIONS

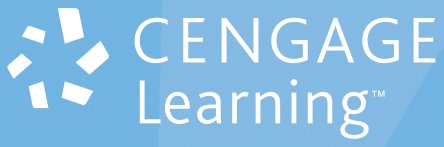
Food Studies
Units 1 and 2

FOURTH EDITION

Glenis Heath
Heather McKenzie
Laurel Tully



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CONTENTS

Acknowledgements V
About this book VI

1 THE ORIGINS OF FOOD 3
Ancient hunter-gatherer societies 4
Mbuti Pygmies 5
The Sami 7
Early development of agricultural food systems 9
Domestication of animals 10
Development of agriculture 10
Thinking skills 15

2 DEVELOPMENT OF FOOD CULTURES 17
Food cultures and cuisines around the world 18
The Fertile Crescent 20
The Mediterranean 25
Eurasia 28
East Asia and Oceania 31
The Americas 35
Thinking skills 39

3 GROWTH OF AGRICULTURE AND TRADE 41
Patterns in the global spread of food production and trade 42
Grains 43
Tea and coffee 46
Spices, sugar and chocolate 48
Salt 52
Thinking skills 53

4 INDUSTRIALISATION AND FOOD PRODUCTION 55
Development of technology in primary food production 56
Thinking skills 67

5 INDIGENOUS AUSTRALIAN FOOD 69
Indigenous Australians 70
Challenges for non-Indigenous settlers of establishing a sustainable food supply 82
Thinking skills 85

6 DEVELOPMENT OF FOOD PRODUCTION IN AUSTRALIA 87
Development of agricultural production in Australia 88
Development of horticulture in Australia 92
Development of food processing in Australia 97
Thinking skills 99

7 IMPACT OF MIGRATION ON AUSTRALIAN CUISINE 101
Patterns of migration to Australia 102
Influence of Greek immigration on Australian cuisine 108
Thinking skills 115

8 FOOD IN CONTEMPORARY AUSTRALIA 117
Food trends driven by changing social behaviours 118
Food subcultures in contemporary Australia 123
Influence of Australian chefs and recipe books on Australian cuisine 125
Does Australia have its own distinctive cuisine? 129
Thinking skills 133



9 AUSTRALIAN FOOD INDUSTRY TRENDS AND ISSUES 135

Components of the Australian food system 137
Current economic trends, issues and influences in the Australian food industry 137
Primary food production in Australia 143
Factors that protect or threaten the quality of the food we grow 148
Thinking skills 151

10 FOOD PROCESSING IN AUSTRALIA TODAY 153

Food processing in Australia 154
Leading food-processing and manufacturing industries in Australia 154
Australian International Foods 157
Role of the food service sector and major food retailers in Australia 164
Influence of consumer demand on Australia's food supply 165
Thinking skills 171

11 FOOD PRODUCT DEVELOPMENT 173

Developing new food products 174
Process of product development 175
Thinking skills 183

12 FOOD SAFETY 185

Regulating food safety in Australia 186
National authorities 186
Australia New Zealand Food Standards Code 188
Food safety standards 192
State authorities 195
Local authorities 195
Food industry safety programs 196
Thinking skills 203

13 SENSORY EVALUATION OF FOOD 205

Sensory evaluation of food 206
Analysing food products 211
Comparing homemade and commercial meals and food products 217
Thinking skills 221

14 PLANNING AND MANAGING MEALS 223

Factors that influence our food choices and meal–planning decisions 225
Planning to shop for family meals 233
The environmentally conscious cook 236
Thinking skills 239

15 DESIGNING AND ADAPTING RECIPES 241

Managing food choices to meet specific dietary needs 242
Developing food skills and becoming a good cook 253
Opportunities and pathways for the home cook 254
Thinking skills 257

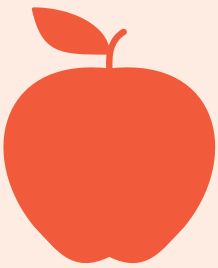
Recipes 259
Recipe index 364
Index 367

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ABOUT THIS BOOK

The fourth edition of this market-leading series has been rewritten specifically for the new VCE Food Studies Study Design and follows units 1 and 2 of the study.

The highly experienced author team has added exciting new dishes to complement existing much-loved recipes.

Featuring fully updated case studies and activities, designed to increase students' understanding and awareness of the issues surrounding food supply and consumption, *Food Solutions* builds a foundation of learning for students to live healthier lives and pursue further training and employment in food-related industries.

Infographic

Visually engaging infographics scaffold key information in the chapter.

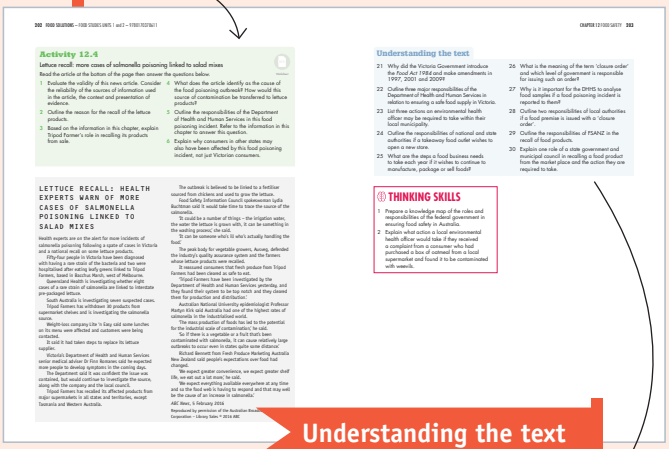


Key terms

Key terms in each chapter are highlighted.

Activities

A range of practical and theoretical exercises address and reinforce learning outcomes.



Understanding the text

These sections are checkpoints for students' learning and appear at regular intervals throughout the text.



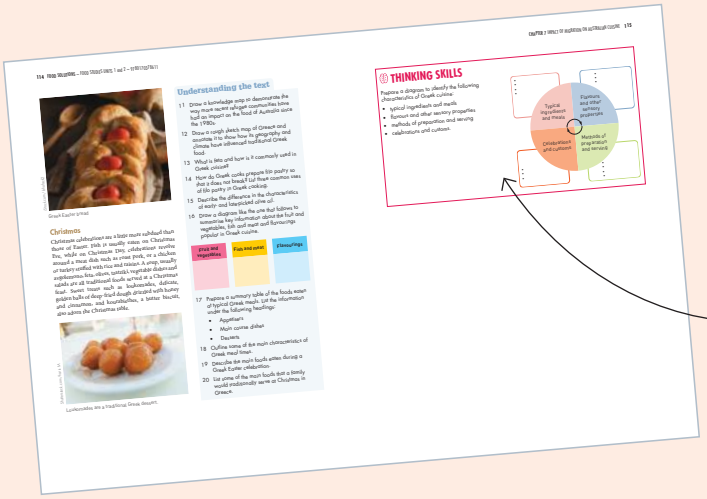
Case studies

These include real-life examples that broaden students' understanding and link to the wider context of food production, distribution and manufacturing.

Recipes

Recipes are included at the end of the book. They have been extensively tried and tested for completion within practical sessions and incorporate a broad range of food preparation processes and cooking techniques, thereby developing and reinforcing students' key skills and knowledge.





Thinking skills

These sections appear at the end of each chapter to challenge students to apply the knowledge acquired in the chapter.

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HUNTER-GATHERER SOCIETIES



THE SAMI

GEOGRAPHIC LOCATION

The Sami are the indigenous people who live in the far northern Arctic and subarctic region of Europe, often referred to as Lapland. The region is very cold, mountainous and treeless.

LIFESTYLE

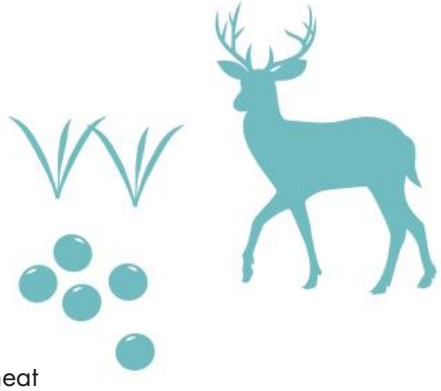
- The early Sami people lived in peat-covered huts.
- The traditional Sami society was based on a system of groups of two or three families living together in what is called a *siida*.



FOODS

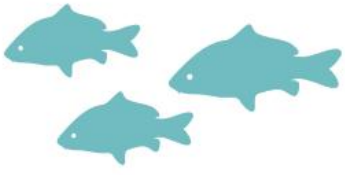
SUMMER

- Fish
- Berries
- Plants
- Meat
- Milk



WINTER

- Preserved meat
- Preserved fish



MBUTI PYGMIES

GEOGRAPHIC LOCATION

The Mbuti people live in the Ituri Forest, a tropical rainforest covering about 70 000 square kilometres of the Democratic Republic of the Congo, in central Africa.

LIFESTYLE

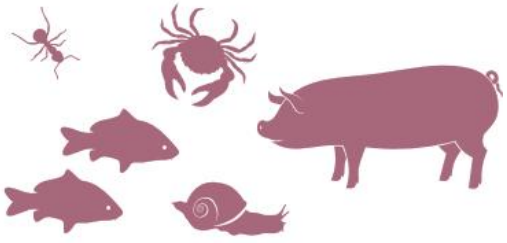
- The rainforest, streams and rivers provide for the basic needs of food, fresh water, firewood and clothing.
- The Mbuti live in village groups called bands or kinship groups consisting of between seven and 30 families who each have their own hut.



FOODS

ANIMAL

- Crabs
- Ants
- Snails
- Pigs
- Monkeys
- Fish



VEGETABLE

- Wild yams
- Termite mushrooms
- Berries
- Leaves
- Honey



1

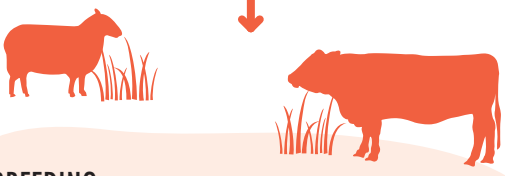
THE ORIGINS OF FOOD

THE EARLY DEVELOPMENT OF AGRICULTURE

DOMESTICATION OF ANIMALS 8000–2500 BCE

SELECTION

- Animals selected could survive on food, such as grass, that was not needed by the human population.
- They needed to reach their adult size quickly to become useful to humans.
- A quiet disposition was required, so they didn't endanger humans or panic when enclosed with other animals.



BREEDING

- The domesticated animals were selectively bred to develop positive traits such as size and strength.

USES

- Domesticated animals provided food, including meat, milk, cheese and butter.
- They were used for pulling farm machinery.
- Skins were used for clothing.



KEY TERMS

CE is the abbreviation of Common Era or Current Era, the calendar era that we use in Australia.

BCE is the abbreviation of Before Common Era; that is, before the year 0.

Chinampas are the plant beds built by the Mayan farmers on floating plots of land.

Cultivate means to deliberately sow and tend crops on nearby land.

Domestication is the process of using selective breeding to make wild plants and animals more useful to humans.

Hunter-gatherer is the term used to describe humans who obtain their food from nature, hunting animals and gathering wild plants.

Sedentary hunter-gatherer communities are groups of people who settled in one place, near a rich food resource.

Swidden farming is an agricultural technique that involves slashing and burning the plants in a forest to create fields to grow crops.



National Library of Australia (nla.obj-134497417)

Hunter-gatherer people lived in small, nomadic groups.

Ancient hunter-gatherer societies

The first humans were nomads who survived by hunting animals and gathering food from wild plants. They moved from place to place, according to the food that was available and the seasons of the year. They followed migrating herds of animals or sought shoals of fish, and gathered nuts, berries and other wild plants. Each day was spent searching for food, making tools such as spears and fishing nets or building shelters so that they could survive.

Hunter-gatherer is the term used to describe humans who obtained their food from nature by hunting animals and gathering wild plants. Ten thousand years ago all humans lived this way. Hunter-gathering was a subsistence lifestyle that provided only the amount of food needed for the people to survive. Hunter-gatherers are sometimes described as foragers, that is, people who obtained food by hunting, fishing or gathering plant matter.

FEATURES OF A HUNTER-GATHERER COMMUNITY

Hunter-gatherers were totally dependent on the natural food available and therefore they were mobile or nomadic, moving on when food supplies in the area were exhausted. Because they were nomadic, they needed to carry all their possessions with them as they moved from one location to another. They also needed to build a shelter when they moved to a new area and so constructed simple shelters with whatever material was available in the new region.

Hunter-gatherer societies tended to be made up of small groups of people, because large communities would quickly exhaust local food supplies. Societies were grouped together by kinship or tribes. The people lived together in cooperative groups, usually without a specific leader, as all men and women, young and old, were considered to have equal power and respect.

Because the group moved frequently in search of wild foods, women could not carry more than one baby at a time. By breastfeeding their children for at least four years, they were able to space births until their children were old enough to walk independently.

TYPES OF FOOD AVAILABLE

Hunter-gatherer societies developed differently depending on the food available in their natural surroundings. Some societies hunted big game or trapped smaller animals, while others fished in lakes

and rivers or along the coast. They all collected fruit, roots, nuts and seeds depending on what grew in the area. Those hunter-gatherer societies that lived nearer to the equator, where temperatures were higher, depended more on gathering rather than hunting and fishing, which provided much of the food source in temperate regions.

Usually, the men were the hunters while the women and young children undertook the gathering and the domestic tasks. The more gathering of food a society did, the more likely it was to be controlled by the women. By contrast, the more fishing and hunting the group used to obtain their food, the more control the men had in the group. Sharing was a central feature of hunter-gatherer societies, and when the hunter returned with meat, it was shared among the whole group.

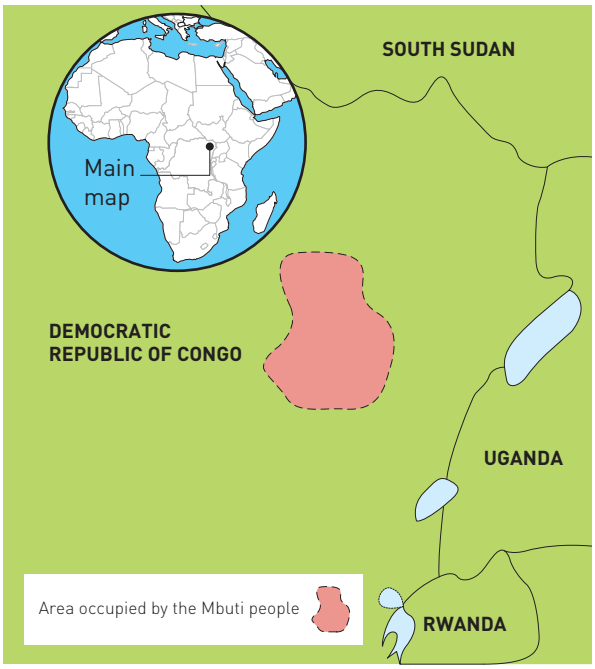
CHALLENGES FACING HUNTER-GATHERER COMMUNITIES

One of the most significant challenges faced by hunter-gatherer communities was a dramatic change in climate. In approximately 12 900–11 700 BCE, the climate in the northern hemisphere suddenly became much cooler and drier. This change in the climate caused shortages of food and often these nomadic people faced starvation after a natural disaster, such as drought, when there was little food available to forage. In addition, many of the hunters' first choice of prey, such as big-game species, began to die out when the grazing lands the animals relied on began to disappear as the climate changed.

Hunter-gatherer communities kept strict control over their population numbers to balance the availability of food resources such as animals, fish, nuts and berries with the number of people they could feed. However, as populations grew larger, there was a greater demand for food than the natural landscape could supply. As communities settled and mothers no longer needed to travel constantly with babies and young children, a family's birth spacing became shorter and communities grew much larger.

Mbuti Pygmies

One indigenous hunter-gatherer society is the Mbuti Pygmies who inhabit the Congo rainforests of Africa. The Mbuti people live in the Ituri Forest, a tropical rainforest covering about 70 000 square kilometres of the Democratic Republic of the Congo, in central Africa. These people are hunter-gatherers and are one of the oldest indigenous cultures of the Congo region of Africa. Today, there are approximately 40 000 Mbuti people living in the Congo.



The Mbuti people live in the Democratic Republic of the Congo, in central Africa.

The rainforest in which the Mbuti Pygmies live has a dry season lasting for one to two months and a moist, humid climate. There are a number of rivers and lakes throughout the forest region. The rainforest, streams and rivers provide for their basic needs of food, fresh water, firewood and clothing. However, periods of excessive rain or long droughts can diminish their food supply.

THE MBUTI LIFESTYLE

The Mbuti live in village groups called bands or kinship groups. The band consists of between seven and 30 families who each have their own hut. The huts are shaped like beehives and are very temporary in structure.

At the start of the dry season, the band goes to the forest to set up a series of camps that allows them to maximise the land area available for foraging. A group or band of people live in a camp for up to a month and then they abandon it as the food supplies begin to diminish.

The Mbuti construct their huts by drawing a circular outline of the house on the ground. They then make the walls by placing strong sticks in the ground around the circular shape. The sticks are tied together with vine at the top to keep them together and they use large leaves to form the roof.



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A typical Mbuti hut

Mbuti groups have no ruling group and little societal structure. Their society is one in which everyone is considered equal and has the same rights. Men and women have equal power, there is little division of labour and everyone shares in the care of the children. Women are in charge of cooking, cleaning, repairing the hut and obtaining water.

HOW DID THE TRADITIONAL MBUTI OBTAIN THEIR FOOD?

Both women and men gather and forage for food. The women make the nets for hunting and the baskets to carry the food they forage. Hunting is usually done in groups of men, boys and women, who all form a cooperative team to assist in catching the animals. The animal foods available in the rainforest are crabs, shellfish, ants, larvae, snails, pigs, antelopes, monkeys, fish and larger animals such as buffalo and elephants. Other foods found in the rainforest include wild yams, termite mushrooms, berries, fruits, roots and leaves, as well as honey. In some seasons, beans, peanuts, hibiscus and gourds are also foraged and eaten.



Alamy Stock Photo/Friedrichvon Horsten

A Mbuti woman holding a basket of palm nuts.

In the past, the Mbuti used large nets and spears to capture and kill large animals such as buffalo and elephants. The nets were approximately 30–100 metres long and strung end to end to form a large semicircle. Up to 30 nets were used in a game drive. The best hunters were placed in the centre of the circle, and boys guarded the ends while the women drove the animals into the nets. Today, the Mbuti are banned from hunting large animals, but they still hunt small animals such as monkeys and antelope with bows and arrows.

Honey is the most prized and sought-after food product in the forest, and the men often lift the women up into trees to obtain the honey from a hive.



Science Photo Library/Norman Lightfoot

The Mbuti use a bow and arrow to hunt small animals.

The Sami

The Sami are indigenous people who live in the far northern Arctic and subarctic region of Europe, often referred to as Lapland. The region covers four countries – Norway, Sweden, Finland and Russia. The Sami peoples' name for their traditional homeland region is Sápmi. Like the Mbuti, the Sami are a hunter-gatherer community.

The Arctic and subarctic region in which the Sami live is a treeless plain, or tundra. Because of its close proximity to the Arctic Circle, the subsoil is permanently frozen and only hardier plants, such as moss, lichen and low-growing shrubs, are able to survive.

THE SAMI LIFESTYLE

The Sami have lived in this area of far northern Europe since the end of the last ice age, more than 10 000 years ago. They traditionally lived a semi-nomadic way of life and ate a diet that was mainly meat-based, supplemented by berries and herbs with the addition of some fat and reindeer milk.

The early Sami people lived in sturdy peat-covered huts in the winter months, and in tents made from reindeer hide during the summer. The frame of the hut or cot was made from crooked birch trunks that formed arches. Straight poles were secured between the frame posts, and birch trunks were placed around the frame to hold the turf in place. This turf covering insulated the hut from the extremes of the winter. The hut had three windows, and an open fire was situated in the centre of the hut. In more recent times, the Sami used a small iron stove and chimney to provide for heating and cooking.



The Sami live in the Arctic and subarctic region of northern Europe.



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A typical Sami peat-covered hut

The traditional Sami society was based on a system of two or three family groups living together in what is called a *siida*. These *siidas* worked collaboratively to share the responsibility of providing the food for their families by hunting and fishing together. The area in which the *siida* hunted and the rivers and lakes in which they fished were tightly controlled and respected by neighbouring family groups. A *siida* council oversaw a number of small family-based groups and made decisions about whether a particular *siida*'s territory needed its to be expanded if its family group increased in size. The *siida* council also helped to resolve conflicts between individuals or neighbouring groups.

HOW DID THE TRADITIONAL SAMI OBTAIN THEIR FOOD?

Because the climate of the far northern Arctic and subarctic region of Europe inhabited by the Sami people is too cold, and the terrain too difficult for agriculture, the seasons of the year became the most important factor in determining the food resources that were available.

Spring and summer were the seasons when the Sami could forage and gather plants, berries and herbs. During these warmer seasons, they also fished and hunted by following the migration patterns of the reindeer so that they could build up supplies and store food for the winter months when food was scarce.

Salmon and trout were in plentiful supply in the summer months and were fished in the major rivers that flowed into the Atlantic Ocean. The fish was eaten fresh or salted, dried or smoked, and stored for use when the waterways froze over.

In addition, the Sami ate a lot of reindeer, elk and bear meat, which provided them with a good source of protein. Reindeer meat is rich in minerals and very lean, and the fat was commonly used instead of butter or milk. Just as they preserved fish, the Sami preserved their meat by salting, smoking or souring so that it could be kept for the long winter months.

The Sami made use of the limited edible plants available and these provided them with many essential vitamins. They gathered edible berries, especially blueberries and lingonberries. Cloudberries were also an important food source as they were a good source of vitamin C that was otherwise lacking in such a high meat- and fish-based diet.



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Cloudberries

The Sami also collected mountain sorrel and used the fleshy leaves to prepare a stew-like dish that was served with milk. Like cloudberries, mountain sorrel is high in vitamin C and was important in preventing diseases such as scurvy. The Sami also gathered the herb angelica and used the tender stalks and roots of the plant. They used angelica in a variety of ways and often simply peeled the roots and stalks and ate them raw or toasted them over a fire. Angelica was also added to reindeer milk, which was then heated, causing it to thicken into a porridge. The milk porridge was then placed in a keg and buried in the very cold mountainous ground where it fermented, enabling the milk to be preserved for use during the cold winter months.



iStock.com/dleroy4

Angelica

Hunting and fishing

Reindeer were very important in the life of the Sami as they provided the Sami with a vital source of milk and meat The Sami also used reindeer as a means of transport. It is thought that by 98 CE the Sami hunted wild reindeer using a series of traps called pitfalls. The pitfalls were constructed by digging a long, deep pit that was then lined with stones. Once a reindeer fell into the pit, it was impossible for it to escape. During the annual migration of the reindeer, the Sami worked in large teams based on their *siida* to build a series of fences to push the reindeer towards the traps. When a reindeer fell into a trap it was killed by being speared with sharpened sticks or with a bow and arrow. During this period, the Sami also kept small numbers of domesticated reindeer for milk or for use as draught animals.

As communities grew, the Sami herded larger numbers of reindeer and became what is known as 'reindeer nomads'. During the summer months, they moved with the herd to their natural grazing pastures in the mountains and stayed with them there until the seasons changed. Then, in the winter months, they drove the reindeer back down to the coastal regions. These hunting practices are evidence of the early domestication of animals by the Sami.



Getty Images/ Cultura RM Exclusive/Philip Lee Harvey

A Sami man herding reindeer in Norway

The Sami were also very proficient fishermen and trappers and they fished for salmon and trout in the lakes, rivers, seas and fjords, and also trapped beaver.

The Sami developed a special knife that had a wide, long blade that was used for many tasks such as cutting small trees for building houses, splitting firewood or butchering reindeer or other animals.

Understanding the text

1. Write a list that identifies the main features of the hunter-gatherer lifestyle.
2. Describe the foods that were available to the hunter-gatherer societies.
3. Explain some of the challenges the hunter-gatherer societies faced in the period 12 900–11 700 BCE.
4. Describe the geographic location of the Mbuti Pygmies.
5. List some characteristics of the lifestyle of the Mbuti Pygmies.
6. Explain how the Mbuti Pygmies hunted for food.
7. Describe the geographic location of the Sami people.
8. Explain how the traditional Sami people lived.
9. Describe the foods that were available to the Sami people in the area in which they lived.
10. Explain how the Sami people hunted and trapped animals, particularly reindeer.

Early development of agricultural food systems

Hunter-gatherer communities began the first attempts at agriculture to decrease the risk and unpredictability of their food supply. In order to care for crops and herds of animals, people needed to live in one place. They began the process of **domestication**, that is, the process of using selective breeding to make wild plants and animals more useful to humans.

These more settled groups became known as **sedentary hunter-gatherer communities**, that is, groups of people who settled in one place near a rich food resource. These communities started to build permanent settlements close to reliable water supplies, to plant and harvest crops and to domesticate or tame animals such as dogs, goats and sheep. However, historical evidence suggests that it took many hundreds of years for agricultural production to become well established and that these communities developed in parallel with hunter-gatherer communities.

One theory suggested for the move to a more agricultural-based settlement rather than

a hunter-gatherer lifestyle is climate change. Changes in climatic conditions and the end of the ice age about 10 000 years ago meant that many big game animals such as bison and mammoths could not survive in the more temperate climate. This change in climate meant that there was a dwindling supply of game for human hunters.

These climatic changes also impacted on the distribution and growing patterns of wild grains and other crops on which hunter-gatherers had traditionally depended. As food sources became scarce, tribes began to go to war over the limited food supply. Groups of people that had once been nomadic moved to more temperate regions where they built stronger, permanent homes and surrounded their settlements with walls to protect themselves from other tribes or clans that might try to overpower them. Agricultural development took place in these settlements, which meant that a larger population could be supported and therefore the group would have more warriors to protect them from invading forces.

Once people became more settled they began to **cultivate** wild plants, that is, to deliberately sow and tend crops on nearby land. Farmers soon discovered which grains gave the best yields and they selected and planted only the best seeds from their last crop. Unlike plants that grew in the wild, domesticated crops were planted in specially cleared plots or seed beds where they had little to no competition from weeds. These crops produced larger clusters of seed heads, which improved their yield and the amount of food that could be produced from the crop. In addition, when they were planted to produce new crops, these larger seed heads germinated more quickly.

As harvests improved, settlements began to produce more food than they needed and so they developed a system for storing the excess grain. This grain was used as the seed for planting future crops or to feed non-farm workers such as craftsmen and women. The farmers also traded their excess grain for various kinds of useful or decorative goods. A stable food supply also meant that nutritional levels increased and so more children were born.

Domestication of animals

Living in settled communities meant that farmers could build enclosures to contain and tame wild animals. The domestication of animals occurred at around the same time as the domestication of wild plants, that is, between 8000 and 2500 BCE. Not all animals were suitable for domesticating and farmers only attempted to tame those animals that could survive on food, such as grass, that was not needed by the human population. The animals they chose to domesticate also needed to mature rapidly so that they could reach their adult size quite quickly and become useful to humans. It was also important to select animals that would not endanger their human masters or panic when enclosed, and so animals with a relatively quiet disposition such as sheep, goats, horses, cattle and oxen were selected.

The domesticated animals were selectively bred and they produced offspring, which farmers used to grow larger herds. These animals provided them with food such as meat, milk, cheese and butter or their skins were used for clothing. Animals such as oxen were also bred to help with the heavy agricultural task of pulling a plough.

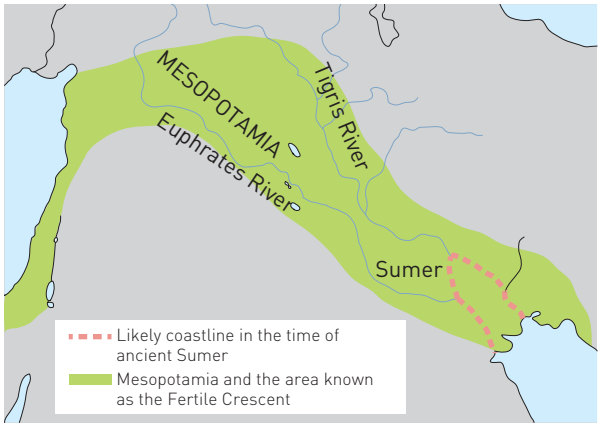


Getty Images/De Agostini

Ancient Egyptian depiction of a cow being milked

Development of agriculture

As occurred in other parts of the world, the earliest people to live in the region called Mesopotamia were hunter-gatherers. Mesopotamia is a large region that covers much of what is today Iraq and parts of Syria and Turkey. The earliest people who inhabited this region lived in tribes or clans, hunted animals and gathered wild fruit, roots, nuts and berries. The earliest village settlements began to appear in northern Mesopotamia about 10 000–6000 BCE. During this period, communities became more settled as they learnt how to grow and dry grains that could then be ground into flour. They domesticated animals and used them to plough the fields and to provide milk and meat.



Mesopotamia covers much of modern-day Iraq.

One of the other areas of development of early agricultural food systems was in ancient Mesoamerica – present-day Mexico and Central America.



The modern-day countries covering the area known as Mesoamerica.

In the era between 50 000 and 10 000 BCE, the people of Mesoamerica were nomadic hunters and gatherers. Gradually, the people of Mesoamerica became sedentary settlers as they began to cultivate wild plants. The cultivation and domestication of these plants allowed them to store surplus food when hunting was poor or during times of drought when food in the natural environment was scarce. The cultivation of wild plants brought these crops closer to their camp sites and made them easier to tend and collect. As sedentary settlements increased and became more permanent, there was a greater reliance on plant-based cultivation and domestication. An important difference between Mesoamerica and Mesopotamia was the domestication process. In Mesoamerica domestication focused on plants, with almost no domestication of animals, whereas in Mesopotamia, both plants and animals were domesticated.

FACTORS THAT FACILITATED THE DEVELOPMENT OF AGRICULTURE

The development of agriculture across the globe was largely dependent on the ability of sedentary hunter-gatherer groups to provide a reliable water supply for crops. Locating fertile land, adapting the landscape so that it could be used for crop growing and developing tools for farming were other important factors that facilitated the development of agriculture in Mesopotamia and Mesoamerica.

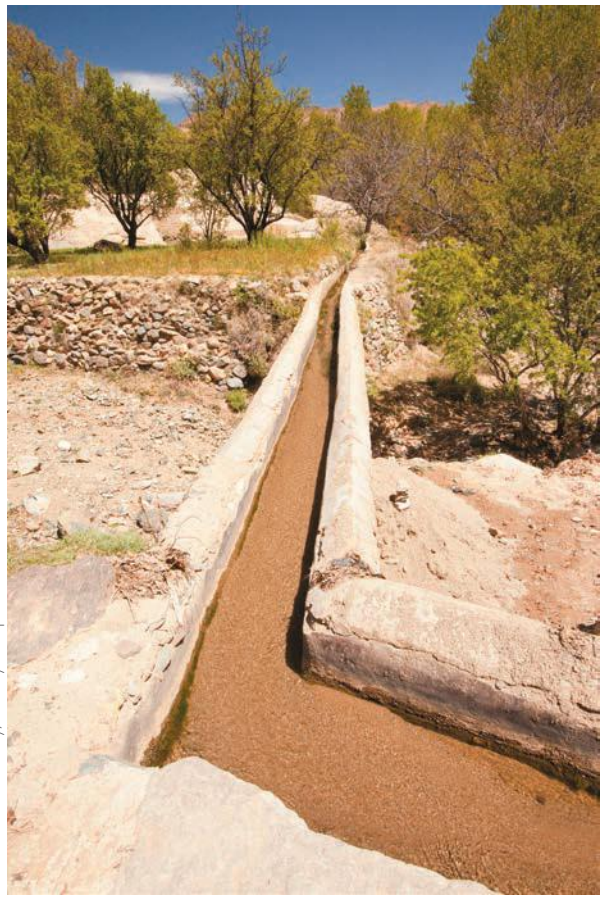
Access to water and the development of irrigation systems

Mesopotamia is a Greek word that means 'between the rivers'. There are two main rivers that flow through this region: the Tigris and Euphrates. The rivers begin in Mesopotamia's high mountains where rainfall is plentiful. They then rush through the grasslands in the lower reaches of the rivers, which became an important region for growing wheat and herding sheep and cattle.

Sumer, one of the first ancient civilisations, developed along the banks of the Euphrates River in southern Mesopotamia in about 3500 BCE. The area around Sumer was crossed by numerous streams that ran from the Tigris and Euphrates rivers. The land around these rivers and streams was very marshy and needed to be drained so that it could be used as farmland.

Archaeological evidence shows that by 5000 BCE, Sumerian farmers developed an extensive network of irrigation canals and waterways. Large embankments were built along the river's edge to prevent the water from spilling onto the fields and allowed the Sumerians to create channels to move the water further inland from the river. The area around the river flood plains was very fertile and the water from the irrigation channels allowed them to grow wheat, flax and barley. The Sumerians also used the irrigation channels to water their fruit and vegetable gardens.

In Mesoamerica, agricultural communities in Central America developed irrigation systems similar to those built in Mesopotamia. However, given the mountainous landscape, irrigation systems were difficult to build and maintain; therefore, they were less effective in Mesoamerica than other systems such as swidden farming and terraced farming.



Science Photo Library/Ashley Cooper

A basic modern-day irrigation channel, similar to ancient irrigation systems used in Mesopotamia.

Mayan farmers who lived around south-eastern Mexico and Guatemala grew crops in raised beds along the edge of rivers. The beds were raised with rich fertile silt from the river beds. These orchard gardens known as *pet kot*, were surrounded by a low wall of stones. Farmers here also built plant beds on flood plains with floating plots of land called **chinampas**.



Alamy Stock Photo/The Art Archive

Chinampas were used by Mayan farmers.

Swidden farming

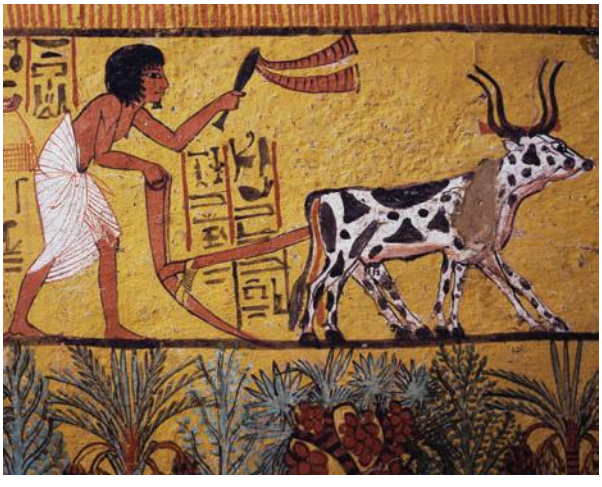
People living in the Central American region of Mesoamerica during the Aztec and Mayan times used various methods to cultivate their land. Farmers in the rainforests grew maize, beans and squash in fields. They used a system called **swidden farming**, an agricultural technique that involved slashing and burning the plants in a forest to create fields for cropping. Seeds for the crops were then planted in the ashes left on the forest floor. The soil remained fertile for a few years and then farmers moved on, allowing the area to return to forest. New areas were found and cleared for the next crops.

Terraced farming

One of the greatest challenges to farming in the mountainous regions of Mesoamerica was the lack of flat arable land. Archaeological evidence shows that early Mesoamerican farmers built extensive terraces into the slopes of mountain valleys. Terraces were constructed by building walls of rock or by cutting down large trees and then backfilling the terrace with soil. This terracing allowed farmers to use more of the land than would otherwise have been available to grow their crops; Aztec farmers used terraces to plant maize.

Development of farming tools

Archaeological evidence shows that the Sumerians began to make tools using the locally available clay,



Getty Images/De Agostini/G. Dagli Orti

A beam-ard plough pulled by oxen



Bridgeman Images/Biblioteca Medicea-Laurenziana

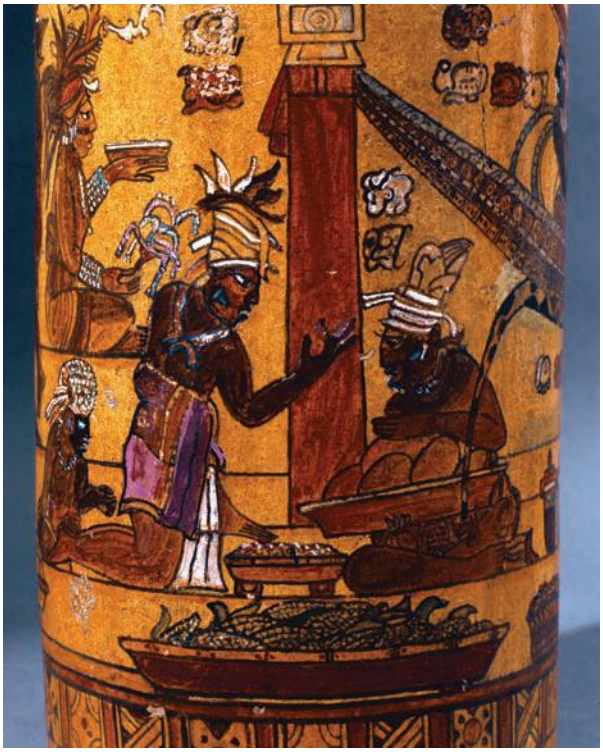
A Mesoamerican farmer using a digging stick

stone and timber to assist them in their farming activities. Pictographs on clay tablets at the end of the fourth millennium BCE, show the use of ploughs in Mesopotamia. These ploughs consisted of a beam-ard, which is a simple machine that scratched a furrow without turning the soil. The land was cultivated by teams of oxen that pulled these wheel-less ploughs and the grain was harvested with sickles. Later, seed ploughs were developed; they consisted of a funnel through which a seed was dropped into the furrow.

Mesoamerican farmers did not use heavy ploughs or horses to help them prepare the land, but only sharp-bladed wooden digging sticks. These sticks, called *uictli,* were used for planting seeds and hoeing weeds.

TYPES OF FOOD AVAILABLE TO EARLY AGRICULTURAL COMMUNITIES

Archaeological records show that maize or corn was grown in Mesoamerica from about 3500 BCE. Maize was considered to be important in the lives of the people of Western Mexico and Mesoamerica because it could be dried and any surplus could be stored for use later in the year. Archaeological relics show the Maize God featured in stone carvings on altars and temples.



Bridgeman Images/Museo Nacional de Antropologia, Mexico City

Ancient artwork reflects the importance of maize.

As well as corn, many Mesoamerican communities, particularly Mayan, also grew winter squash and climbing beans. These three crops were often grown as companion crops and became known as the 'three sisters'. Planting the three crops closely together was important as the strong corn stalks provided a natural framework for the beans to climb and the squash covered the surface of the soil and prevented weeds from growing. The beans also worked as a natural fertiliser, adding nitrogen to the soil, and they were a valuable food source with their protein content. The squash or bottle gourd – a relative of today's pumpkin – was also useful when dried, for collecting seeds for grinding or planting and for carrying water.

Fruit trees were thought to be some of the first plants domesticated and cultivated in Mesoamerica. These trees were highly productive and a good source of food for early civilisations. Another culturally important plant was the cacao plant, which was used for making ancient Mesoamerican chocolate. Cacao beans later became an important commodity used in trade.

In the Mesopotamian city of Sumer, barley and wheat were widely grown along with oats and lentils.

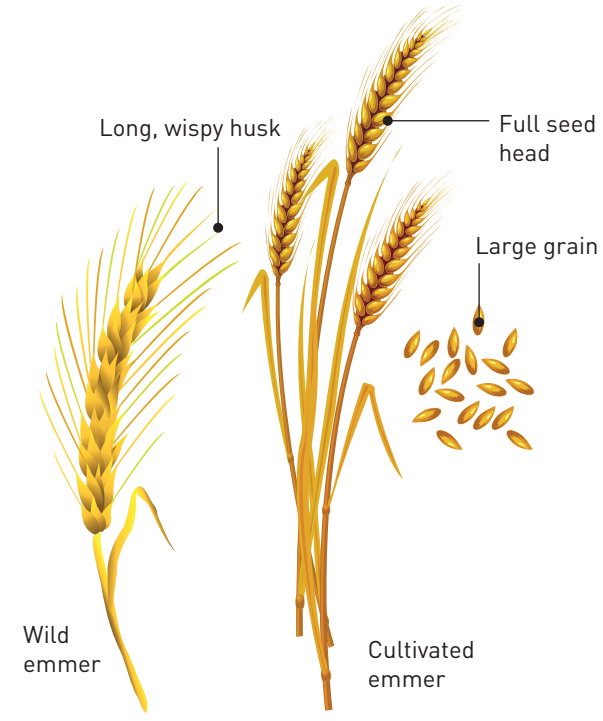


AGEfotostock/De Agostini Editore

Sumerians harvesting wheat

Mesopotamian farmers used selective breeding to develop emmer wheat and einkorn wheat from native grasses. The wild grasses have small seed heads and are difficult to harvest. Emmer wheat became the most widely grown type of wheat as it has larger seeds and therefore provided a higher yield than the einkorn variety.

The Sumerians also developed extensive gardens, and one of the most important crops they grew was dates from the date palms that were indigenous to the region. They also developed extensive gardens by using the shade produced by the palm trees to protect their vegetables and fruit from the hot sun. Some of their most successful crops included peas, beans, lentils, cucumbers, eggplants and leeks, and fruits such as grapes, apples, melons and figs.



Wild emmer and cultivated emmer

Activity 1.1

Taste-testing corn products

Corn is one of the world's most important crops and is used widely in food production.

Aim: To investigate the sensory properties of products made from corn

Method

1. Select three or four products made from corn such as canned corn, natural popcorn, corn tortillas and natural corn chips.
2. Place a small quantity of each corn product in separate containers.
3. Taste-test each of the products and record your description of the appearance, aroma, flavour and texture of each corn type. After testing the product, rate it using facial hedonic descriptors.
4. Write up your sensory analysis using technical terminology.

Results

Record your results in a table similar to the one on the next page.

PRODUCT	1	2	3	4
Appearance				
Aroma				
Flavour				
Texture				
Facial hedonic descriptor				

Analysis

1 Which product has the strongest corn flavour? What factors would account for this?

2 Explain the impact of high heat on the texture of popcorn.

3 List other uses of corn in the food industry.

Conclusion

Recommend some uses for each of the corn products you have tested and give reasons for your choice based on the findings of your sensory test.

Understanding the text

11 Explain how the first humans provided a food supply for their communities.

12 Suggest reasons why many hunter-gatherer communities gradually developed into agricultural communities.

13 Explain why cultivated crops were likely to give a better yield than wild crops.

14 Outline some important considerations for farmers when domesticating animals.

15 Explain how the Sumerians built irrigation systems to enable them to develop agriculture.

16 Explain the process of swidden farming and why it was an important technique used by early farmers in Mesoamerica.

17 Why did the people of Mesoamerica use terraces as part of their agricultural system?

18 Identify the crops that are included in the 'three sisters' and explain why these were important staple crops.

19 Outline the importance of the cacao plant to early agricultural communities.

20 List some of the important foods grown by the Sumerians in their gardens.

THINKING SKILLS

Worksheet

1 Identify and compare the features, advantages and challenges of hunter-gatherer and agricultural food systems.

2 Draw a sketch that symbolises each food system.

3 Identify the food system that you believe is the most reliable in feeding human populations. Justify your answer.

	TYPES OF FOOD AVAILABLE	ADVANTAGES TO THE COMMUNITY	CHALLENGES IN FEEDING THE POPULATION
Hunter-gatherer			
Agricultural food systems			

TRADITIONAL FOODS EATEN AROUND THE WORLD



ETHIOPIA

- Teff – a staple grain grown in the Ethiopian highlands
- Injera – a spongy, fermented flatbread
- Wat – a hot spicy stew made with either beef, lamb, chicken or goat



SPAIN

- Paella – rice, onion, garlic, tomatoes, chorizo, shellfish, peas and beans
- Gazpacho – a cold soup with a tomato and garlic base
- Jamón serrano – dry-cured ham
- Churros – a batter-like dough that is usually deep-fried, often rolled in cinnamon and sugar and sometimes dipped in chocolate



INDIA



The North

- Tandoori chicken is chicken roasted with yoghurt and spices.
- Wheat is used in preference to rice, and breads such as naan, parathas, chapatis and roti are eaten with almost every meal.
- Ghee, a clarified butter, is widely used for cooking, and dishes are often enriched with cream.
- Warm spice mixes, rather than hot chilli, are used to flavour foods.

Central India



- Vegetarian dishes are common.
- Rice is a staple dish of the region.
- Fish is widely eaten in coastal regions.

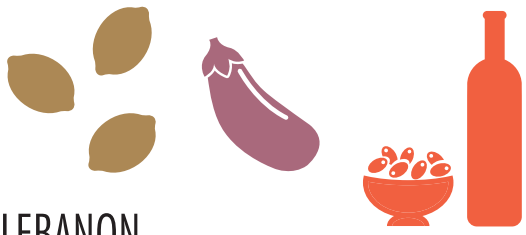
Southern India

- Coconut milk and freshly grated coconut
- Dahl – stewed split pulses and legumes
- Papadums – thin, brittle discs made mainly from the flour of pulses and legumes
- Fresh fish and seafood in coastal regions



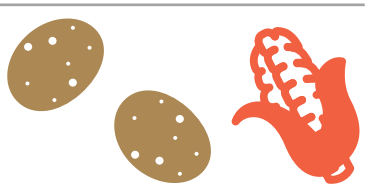
JAPAN

- Rice and noodles – staple ingredients in Japanese cuisine
- Sushi – a dish made using rice and raw, fresh seafood
- Sashimi – thin slices of raw fish
- Gyozas – dumplings made with ground meat and vegetables and wrapped in a thin dough
- Miso soup – made from fermented soybeans and salt



LEBANON

- Kafta – sausage-like skewers of meat made from minced lamb and spices
- Farrouj meshwi – a chargrilled garlic chicken dish
- Tabouli – a salad made with fresh tomatoes, cracked wheat, parsley, mint and onion
- Stuffed vegetables – zucchini, peppers and eggplant
- Baklava – dessert made with filo pastry, and pistachio nuts in the filling and drizzled with a rosewater syrup
- Olive oil, lemon, garlic and spices used as flavouring ingredients in almost every meal
- French-style custard desserts and croissants



PERU

- Potatoes
- Quinoa – the seeds are ground and eaten as a cereal
- Mote – boiled dried corn (maize)

2

DEVELOPMENT OF FOOD CULTURES

KEY TERMS

Cuisine is the style of cooking that reflects the characteristics of a particular country or geographic region.

Culture refers to the shared or learnt patterns of behaviour or identity of a group of people.

Fertile Crescent is a semi-circular or crescent-shaped region of fertile land to the east of the Mediterranean Sea that forms a 'bridge' between Africa and Eurasia.

Ramadan is the Muslim month of prayer and fasting, when Muslims fast each day from sunrise to sunset.

Food cultures and cuisines around the world

All countries throughout the world have their own particular culture. The term **culture** refers to the shared or learnt patterns of behaviour or identity of a group of people. This group identity includes the characteristics, customs and knowledge of the group, and is based on their shared language, religion, ideas, social behaviour, food, music and arts.

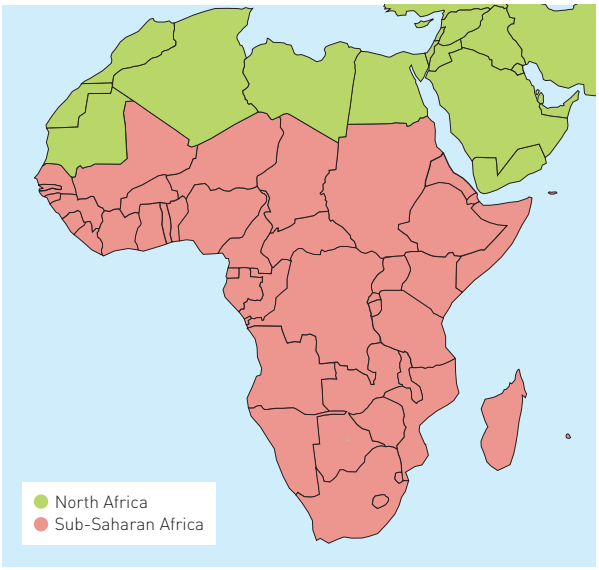
Although it is just one aspect of our culture, food is fundamentally important to our lives. Our day revolves around food, not only because we need it to survive, but because it is a symbol of our friendship and generosity, our position in society and in some cases, our religion. When we think about food, it often evokes memories and sometimes a sense of nostalgia for times past – not only can we visualise the food, we can also recall its aroma and flavour. These memories are links to our culture.

Cuisine is part of our culture. It is the style of preparation and cooking that reflects the characteristics of a particular country or geographic region. A cuisine is based on the distinctive ingredients, cooking techniques and traditional dishes of a group of people and it develops over time. It is influenced by locally available ingredients that can be grown or produced in a particular area based on the climate and land formations, or by ingredients that have been obtained through trade. Traditional cooking methods and religious food laws also influence the cuisine of various cultural groups.

Throughout the world, factors specific to a particular region have influenced the development of food production and food culture. This has meant that while there may be some similarities between various cuisines, such as the foods of countries in sub-Saharan Africa and the foods of countries of the Middle East, there are also many quite distinct differences. The foods of the Mediterranean, for example, also differ from the foods of countries in Asia or the Americas as they have different cultures, climatic and geographic conditions, and religious beliefs.

SUB-SAHARAN AFRICA

The African continent is divided into two main regions – North Africa, which lies north of the Sahara Desert and sub-Saharan Africa, which includes all of the countries south of the Sahara Desert. More than 40 countries make up the region of sub-Saharan Africa. These countries are culturally diverse and many include a large number of tribes and different ethnic and social groups.



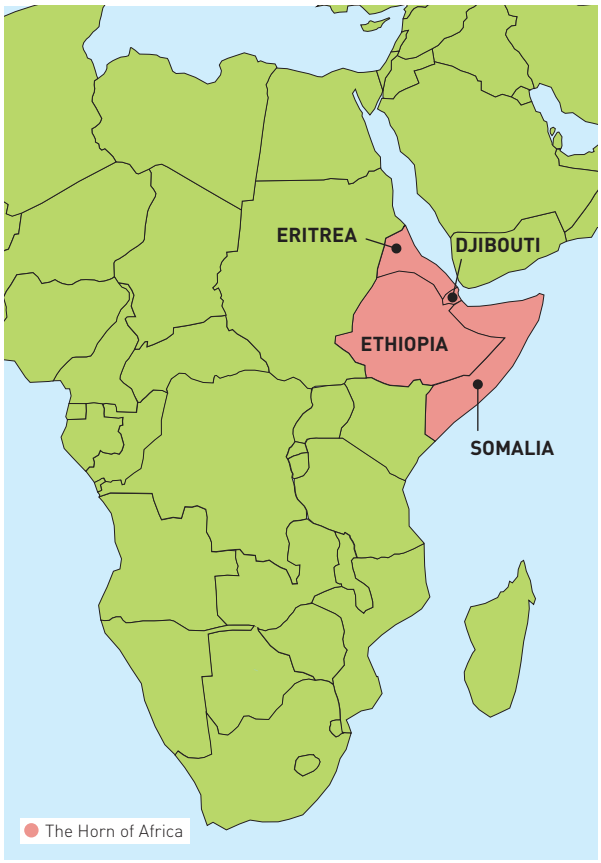
Sub-Saharan Africa

DEVELOPMENT OF FOOD PRODUCTION AND FOOD CULTURE IN SUB-SAHARAN AFRICA

As with all other early civilisations, the people who lived in the region south of the Sahara in approximately 7000 BCE foraged for food by hunting, gathering and fishing. The food supply across the continent of Africa was very dependent on the climate and landscape. The savannah-covered regions of central Africa supplied the population with a wide range of game meat for hunting, and nuts, berries, tubers and roots could be easily gathered. However, in the dense rainforest regions of Africa, fresh meat was harder to come by so the people relied on fish from the rivers to supplement the vegetables they were able to collect.

As communities increased in size, it became more difficult for them to move about and to collect enough food for the group based on their traditional hunter-gatherer lifestyle. In order to be able to support an increasing population, communities developed settlements based on agriculture and the domestication of animals.

REGIONAL INFLUENCES ON FOOD PRODUCTION IN ETHIOPIA



Ethiopia is part of the Horn of Africa in sub-Saharan Africa.

Ethiopia, along with Eritrea, Somalia and Djibouti, lies in the easternmost peninsula of north-east Africa, called the Horn of Africa. This region has an ancient history of civilisation. Evidence shows that in approximately 16 000 BCE, people living in this area gathered grasses, tubers and nuts as a source of food. By 8000 BCE, agricultural practices had developed and wheat and barley were cultivated.

The mountainous terrain throughout much of Ethiopia has meant that the country remained fairly isolated from neighbouring countries; therefore, the Ethiopian cuisine has not been greatly influenced by other cultures.

One of the biggest influences on the cuisine of Ethiopia has been the influx of exotic spices that are now considered central to the cooking of the region. Spice traders travelled through Ethiopia from the Far East to Europe over many centuries. Today, spices are still an integral part of Ethiopian cuisine and are widely used to help preserve food in regions where access to refrigeration is limited.

Geography and climate

Ethiopia is located just to the north of the equator and is therefore described as being in the tropical zone of Africa. However, the range of geographical features in the country means that the climate varies significantly from cool and temperate to hot.

The highland regions are cool climate areas where teff, wheat and barley are widely grown. The central plateau region has a temperate climate and the very fertile land produces much of the country's oat crop. The lowland regions are subject to hotter temperatures; they receive little rainfall and are more prone to drought. In these areas, sorghum, a hardy crop suited to semi-arid areas, is one of the crops most widely grown.

Religion

There are three main religions in Ethiopia: Christianity, Islam and Judaism. Ethiopian Tewahedo Christians are the largest religious group. The members of this Church follow a number of fasting traditions. The days of the year when followers can eat meat, eggs, milk, butter and cheese are restricted, and these foods cannot be eaten on Wednesdays and Fridays, with the exception of the 50 days between Easter and Pentecost or Whitsunday. Several other periods of fasting are also followed by Ethiopian Tewahedo Christians. During periods of fasting they can only eat vegetarian meals based on lentils, split peas, grains, fruit and a vegetable stew that may be served with injera bread.

Ethiopian Orthodox Tewahedo Christians and members of the Muslim and Jewish faiths are also prohibited from eating pork.

Meal structure

Food is very important in the lives of the Ethiopian people, and they enjoying sharing food with friends. All food is served from a communal table and the eldest members of the family are always the first to be served.

Traditionally, Ethiopians eat their food with their right hand. They always wash their hands before the start of the meal and then again at the end of the meal. Hand washing is an important ritual and involves the diner holding their hand over a basin and then pouring water over their hand from a small jug.

Traditional foods of Ethiopia

Teff, the staple grain grown in the Ethiopian highlands, has seeds the size of tiny poppy seeds, and it has a mild nutty flavour. In Ethiopia, teff is ground and made into a spongy, fermented flatbread called injera. Teff is rich

in essential nutrients, including protein, calcium, iron and silica, and it contains vitamin C, which is unique for grains. It is also high in resistant starch, a dietary fibre that helps to maintain blood sugar levels, weight control and colon health. Teff can be cooked similarly to savoury rice and can be used as a substitute for other grains in salads and baked goods.



Alamy Stock Photo/Bildagentur-online

Harvesting teff in Ethiopia

Wat, a hot spicy stew made with beef, lamb, chicken or goat, is the national dish of Ethiopia. To eat *wat*, Ethiopians tear off small pieces of injera and use it to scoop up the spicy meat stew. *Berbere*, a spicy paste, is widely used in Ethiopian cuisine and is a key ingredient in *wat*.

Activity 2.1

Teff pancakes

1. Work with a partner to prepare one quantity of teff pancakes following the recipe provided.
2. Undertake a sensory analysis of the appearance, aroma, flavour and texture of the pancakes. Write up your sensory analysis using technical terminology.
3. After tasting the product, rate it using a facial hedonic descriptor.

Worksheet

Teff pancakes

½ cup cracked brown teff grain
¼ cup gluten-free flour
¼ teaspoon salt
¼ teaspoon bicarbonate of soda
½ cup plain yoghurt
¾ cup soda water

Method

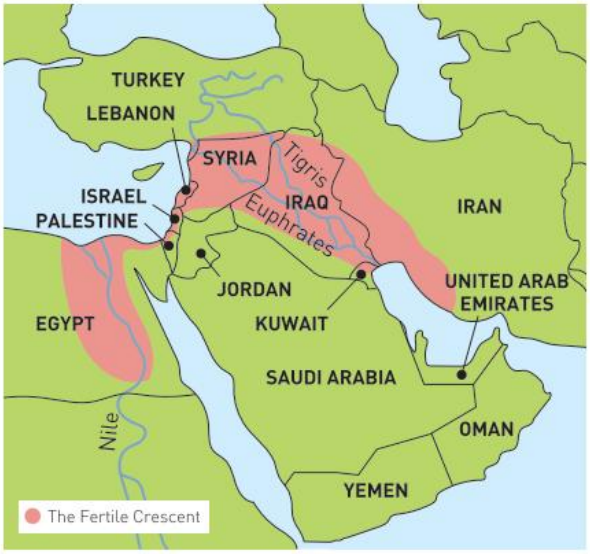
1. Place the teff grain in a food processor or blender and blend on high for a few minutes.
2. Mix the cracked brown teff with the flour, salt and bicarbonate of soda.
3. Mix the yoghurt with the soda water and combine with the flour into a smooth batter.
4. Heat a non-stick pan and spray with canola oil.
5. Pour a thin amount of batter onto the pan and tilt to make a large round pancake.
6. Cook for 1–2 minutes on each side or until the pancake darkens.
7. Serve with curry, casserole or a stew.

Serves



Alamy Stock Photo/Julio Etchart

The Fertile Crescent



The **Fertile Crescent** is a semi-circular or crescent-shaped region of fertile land to the east of the Mediterranean Sea that forms a 'bridge' between Africa and Eurasia. A number of early societies originated in this region, including in Sumer, Babylonia, Assyria and Egypt. Archaeological evidence shows that these

communities were some of the earliest groups to develop agricultural practices such as irrigation systems.

Today, the countries that are part of the Fertile Crescent, now part of the region of the world known as the Middle East, are Egypt, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Palestine, Saudi Arabia, Syria and Turkey.

DEVELOPMENT OF FOOD PRODUCTION AND FOOD CULTURE IN THE FERTILE CRESCENT

The region is called the Fertile Crescent as it contains the valley of the Nile River and the valley of the Euphrates and Tigris rivers. Around 9000 BCE, agricultural communities began to develop in these regions because they contained large pockets of fertile land in an otherwise arid landscape. When any of the rivers in these valleys flooded, they provided rich silt deposits that fertilised the surrounding land. The land that bordered the rivers was also flat and therefore ideally suited to farming. As groups began to settle close to the rivers, they developed systems to harvest the water so they could have a regular supply of irrigated water for their crops.

Several staple crops were grown in the Fertile Crescent, including barley, einkorn wheat and emmer wheat, and the Egyptians used emmer wheat to make bread. As agricultural communities grew, they cultivated other crops, such as beans, lentils and chickpeas. With the development of agricultural technology throughout the Fertile Crescent, communities began cultivating indigenous fruits, such as palm dates, grapes and watermelon.

REGIONAL INFLUENCES ON FOOD PRODUCTION IN LEBANON

Lebanon is a small sovereign state that lies on the shores of the Mediterranean Sea. It shares a border with Syria and Israel, and is close neighbours with Jordan, Iraq, Saudi Arabia and Turkey. Today, Lebanon has a population of approximately 4 million people.

Archaeological evidence shows that Lebanon is the home of some of the earliest people who lived in quite complex societies and who developed agriculture in the region.

Having a sea border meant that many members of these ancient communities became proficient sailors and the port regions along the coastline became key centres of trade.

Ancient trade routes passed through Lebanon and many nomadic tribes brought exotic spices and foods such as rice and dates with them on their journeys because these foods did not spoil as they travelled across vast distances. The Lebanese soon incorporated many of these foods into their local cuisine.



Lebanon and neighbouring countries

Turkey, a close neighbour of Lebanon, also had a big impact on the food culture and cuisine of the country. The Ottoman Turks who controlled Lebanon for almost four centuries from about 1500 CE introduced the Lebanese to a range of ingredients, including olive oil, fresh bread, stuffed vegetables and meats, nuts and baklava. The Ottoman Empire also introduced the Lebanese to lamb, which is now one of the most popular meats in Lebanon. Yoghurt, a popular ingredient in Lebanese cuisine today, was also introduced to Lebanon by the Ottomans.

More recently, the French have influenced the cuisine of Lebanon. Following World War I, Lebanon became a French mandate and remained so until 1946. During that short period of history, French-style custard desserts, and croissants became an important part of Lebanese cuisine.

Geography and climate

The small Lebanese landmass is very varied. The Lebanon Mountain range stretches almost the entire length of the country and has had a big impact on the development of agriculture in the country. While the thin, porous limestone rocks of the mountains produce poor soil, they allow underground springs to develop. These natural springs meant that although Lebanon has no natural river system, the early farmers could create complex irrigation systems to cultivate the middle and lower slopes of the mountains.

Another key geographical feature of Lebanon is the narrow coastal plain that runs the length of the sea border. This area provided fertile land for horticultural crops to be grown, particularly citrus fruits. Like the

coastal plains, the Bekaa Valley in eastern Lebanon is very fertile and early agricultural communities grew grain in this region. Today, fruits and vegetables are widely grown in the fertile lands of the Bekaa Valley. The Mediterranean climate of Lebanon, with hot, dry summers and cool, wet winters, also enabled fruit and cereal production to flourish in this region.

Religion

Muslim and Christian sects have lived in Lebanon since the 7th century CE and both religions have influenced the food culture and cuisine of the country.

Followers of the Muslim faith in Lebanon, like Muslims throughout the rest of the world, follow a number of important rituals related to food. One of the most important of these is that under Islamic law, Muslims can only eat halal meat; that is, the meat of animals that have been killed following traditional Muslim practices. Islamic law also forbids the eating of pork or pork products.

Ramadan, the Muslim month of prayer and fasting, is perhaps the most important time in the Islamic calendar. During the month of Ramadan, Muslims must fast each day from sunrise to sunset. Before sunrise, they share a meal called the *suhoor*. This meal is meant to sustain believers for the whole day and often includes dates, bread, fruit and vegetables. After sunset, Muslims join in what is called the *iftar* meal to end the daily Ramadan fast. Like *suhoor* meals, the *iftar* meals contain fresh fruit, vegetables and breads, as well as cheeses, soups, halal meats and sweets. To mark the end of Ramadan, Muslims celebrate with the Festival of Eid-ul-Fitr. The Festival of Eid, which lasts for three days, is a time of great celebration for the whole family. A wide range of special snacks, main course dishes and sweet treats and desserts are prepared for the festival, including some that are only prepared to celebrate the Festival of Eid.

The Lebanese Christian community includes Maronite, Orthodox, Melkite and Protestant. Like the Islamic community, Christians have many traditional festivities that centre on food. During Lent and on Good Friday, Christians do not eat meat or any animal products. Easter Sunday is a day of celebration, when the Christian communities shares an elaborate lunch with their families. Chicken or turkey stuffed with nuts, rice and sugared almonds dusted with icing sugar are the focus of the celebrations.

One of the key sweet treats associated with the cuisine of Lebanon is called maamoul. It is a sweet shortbread biscuit made with semolina flour, butter and rosewater, and filled with a mixture of dates, walnuts, pistachios, sugar and orange blossom water. The baked maamoul are finally drenched in icing sugar before they are eaten. The making of maamoul is part of both the Muslim and Christian traditions. In the Muslim tradition, maamoul are wrapped and given as a gift to visitors who call during Eid to wish the family good fortune. In the Christian tradition, maamoul is made especially at Easter. The Christian version of maamoul is very similar to the Muslim version, but usually smaller in size. They are generally not wrapped, but are eaten on Easter Sunday as a way of breaking the fasting period of Lent.



Alamy Stock Photo/Zoonar GmbH

Maamoul is a sweet treat, often given as a gift in Lebanon.

Meal structure

Food is central to family life in Lebanon. It is a symbol of hospitality and no one ever eats alone – food is always for sharing! Even a simple family meal will start with a range of small dishes that are placed in the centre of the table for everyone to help themselves. These small portions of food are known as *mezze* and frequently include dips such as hummus, the popular chickpea dip; or baba ganoush, a smoked eggplant dip. These dips are served with flatbreads and salads.

Traditional foods of Lebanon

The food of Lebanon shares many common elements with food from other countries in the Middle East and Mediterranean region, such as Turkey and Greece. Its close proximity to these countries has meant that the ingredients and flavours of the Mediterranean region have been infused into the cuisine of Lebanon.

Lamb is the one of the most popular meats in Lebanese meals. Kafta, sausage-like skewers of meat



iStock.com/jjpoole

Kafta

made from minced lamb and spices, is one of the most popular meat dishes in Lebanese cuisine.

Poultry and goat meat are also popular choices in Lebanese cuisine and are used to make a range of dishes such as a chargrilled garlic chicken dish called farrouj meshwi. Tabouli (also tabouleh and tabbouli), a salad made with fresh tomatoes, cracked wheat, parsley, mint and onion, is also a very popular dish in Lebanese cuisine, and in other Middle Eastern countries. Stuffed vegetables, such as zucchini, peppers and eggplant, are also common in the meals of Lebanon.

Olive oil, lemon and garlic are used as flavouring ingredients in almost every meal, as are spices. Za'atar, an essential spice mixture in Lebanese cuisine, is used to flavour both meat and vegetable dishes.

Freekeh also traces its roots back to ancient civilisations in Lebanon and Egypt. Freekeh is not a specific cereal variety; it is the name given to the process of producing the cereal. The grain is harvested while it is young and green then it is roasted. Traditionally, the grain was harvested in early spring rather than being allowed to fully ripen. The wheat stalks were then dried in the sun and set alight to burn the straw and chaff. The remaining grain was rubbed and cracked, producing a green, chewy, moist cereal with a smoky, nutty flavour. Today, freekeh is considered to be a 'superfood' because it is high in protein and fibre and has a low glycaemic index (GI).

Lebanese desserts are often based on fruit such as melons, persimmons, apples and grapes. Other key dessert ingredients include pistachios, semolina, cheese, sesame seeds and rosewater. Lebanese baklava, while made with similar ingredients to its famous Greek cousin, has pistachio nuts in the filling and is then drizzled with a rosewater syrup rather than the walnuts and honey used in the Greek version.

Case study

A1 Bakery

The A1 Bakery on Sydney Road, Brunswick, is one of Melbourne's leading Lebanese bakeries and Middle Eastern grocers. It was established in 1992 to provide Melburnians with authentic Lebanese cuisine. Today the A1 Bakery operates a number of bakeries throughout Melbourne – the original store in Brunswick, as well as stores in Dandenong, Fairfield and Essendon.

Weblink

The A1 Bakery sells a wide variety of breads such as its famous Turkish bread, a popular sourdough bread called juju, pocket breads, qurban bread and a wide range of wholemeal, brown, white and organic seeded breads. In 1997, the owners of the A1 Bakery opened their own bread-manufacturing plant so that their much-loved bread could be purchased in other parts of Melbourne.

Walking into the A1 Bakery is an exciting culinary experience. A vast array of pizzas and traditional Lebanese pies and pide, falafel or chicken wraps, spinach and cheese triangles, salads, and dips with Turkish bread are freshly made each day. The A1 Bakery grocery also sells a wide variety of oils, spice mixes, homemade dips and pickles.



Ainsley Ryan

A1 Bakery, Sydney Road, Brunswick



Aleisha Mak

A1 Bakery flavoured flatbread

Activity 2.2

Cooking with freekeh

Worksheet

Tabouli is a dish traditionally associated with Lebanon. This dish originated in the mountain regions of Lebanon where it was originally made from bulgur, a variety of wheat grown in the region. This recipe is based on tabouli and uses freekeh, which also originated in Lebanon.

1. Work with a partner to prepare one quantity of freekeh and tomato salad following the recipe provided.
2. Serve the freekeh and tomato salad with shop-bought mini pocket bread.
3. Undertake a sensory analysis of the appearance, aroma, flavour and texture of the freekeh and tomato salad. Write up your sensory analysis using technical terminology.
4. After tasting the product, rate it using a facial hedonic descriptor.

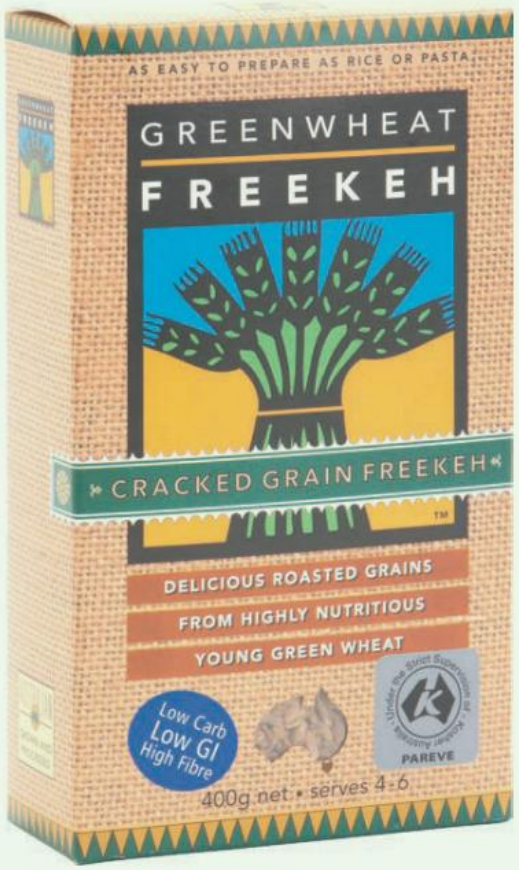


Freekeh and tomato salad

1 cup water
¼ cup cracked freekeh, washed and drained
1 tomato, finely diced
½ Lebanese cucumber, finely diced
2 spring onions, finely sliced
½ cup parsley, chopped
1 tablespoon mint, finely chopped
½ lemon, zest and juice
1 tablespoon oil
salt and pepper
4 mini pocket bread

Method

1. Bring water to the boil in a small saucepan with a tight-fitting lid.
2. Add the freekeh to the boiling water. Cover and simmer over a low heat for 20–25 minutes until tender. Drain if necessary.
3. Combine the freekeh, tomato, cucumber, spring onions, parsley and mint.
4. Mix the lemon zest, lemon juice and oil, and stir through the freekeh mixture. Season with salt and pepper.
5. Carefully cut the pocket bread open and fill with ¼ of the freekeh and tomato salad.

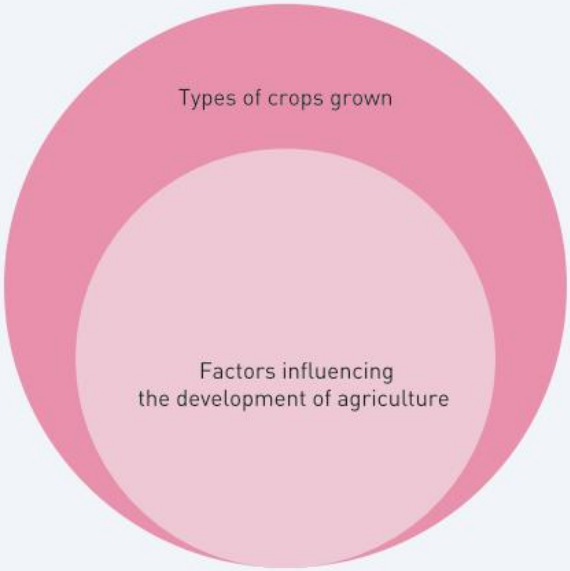


Freekeh

Understanding the text

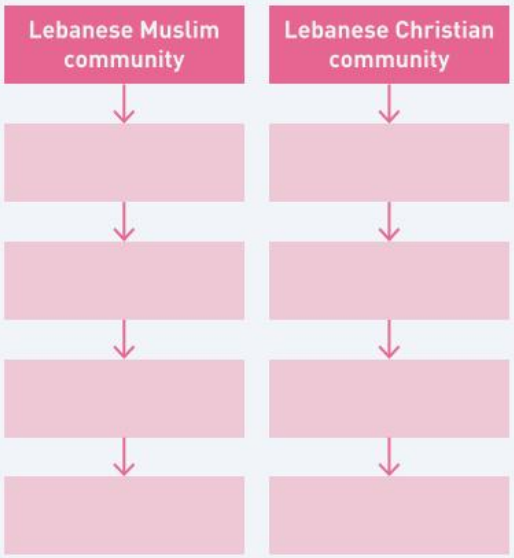
1. Write a short paragraph to explain the difference between food culture and cuisine.
2. Draw a diagram to demonstrate the differences in the types of food available in the savannah-covered regions of central Africa compared with those in the dense rainforest regions of Africa.
3. Outline the reason why there was little external influence on Ethiopian cuisine until modern times.
4. Write a short paragraph to explain how geography, climate and religion have influenced food production in Ethiopia.
5. Draw a knowledge map to demonstrate the importance of including teff in the diet.
6. Explain what is meant by the term the 'Fertile Crescent'.

7 Draw a diagram like the one below to demonstrate the factors that influenced the development of agriculture in the Fertile Crescent in the period 9000 BCE and the staple crops that were grown during this period.



8 Explain how Lebanon's location on the Mediterranean Sea influenced the types of food available to early communities.

9 Draw a diagram like the one below to compare the characteristics and rituals related to food of the Lebanese Muslim community and the Lebanese Christian community.



10 Draw a mind map to demonstrate the traditional foods eaten in Lebanon.

The Mediterranean

The Mediterranean Sea is a large sea that borders three continents – Europe, northern Africa and south-western Asia. The modern-day countries that make up the region of the Mediterranean include Algeria, Croatia, Cyprus, France, Greece, Italy, Lebanon, Malta, Spain, Tunisia and Turkey, as they all border the Mediterranean Sea.

DEVELOPMENT OF FOOD PRODUCTION AND FOOD CULTURE IN THE MEDITERRANEAN

Archaeological evidence shows that agriculture began in the Mediterranean region approximately 1000 BCE when early farmers began cultivating cereals, particularly wheat and barley, and legumes. They developed colonies in these regions, which had an ideal climate for crop growing, that is, hot summers and cool, wet winters. These communities also began domesticating animals, and archaeological finds have shown that they kept sheep, goats and pigs. Many seafaring people lived on the shores of the Mediterranean so fishing skills soon developed, and fish and shellfish became important food sources.

REGIONAL INFLUENCES ON FOOD PRODUCTION IN SPAIN

Spain, along with Portugal and Gibraltar, is situated on the Iberian Peninsula. Spain is the largest country on the Peninsula and makes up approximately 85 per cent of the landmass. It has an extensive coastline that borders the Mediterranean Sea to the south and east, the Bay of Biscay in the North, and the Atlantic Ocean in the West.

Throughout its history, the food culture and cuisine of Spain has been influenced by a number of invading forces.

Between the 6th and 7th centuries BCE, the Phoenicians, natives of the Fertile Crescent, arrived on the Iberian Peninsula. The Phoenicians were great maritime traders and brought olive trees to Spain. In the 4th century BCE, the Greeks began moving into the coastal regions of Spain and brought with them highly developed skills in grain production and in



Countries of the Mediterranean



Spain and neighbouring countries

methods of storing grain for longer periods of time. This allowed grain production in the area to increase dramatically and allowed the Greeks to export grain back to their home colonies. During this time, the Greeks also brought with them their knowledge of fishing and collecting shellfish; fish and shellfish have become a key part of the cuisine of Spain.

At the end of the 2nd century BCE, the Romans arrived in Spain. The Romans were well respected for their knowledge and expertise in agricultural production and transportation systems, and consequently had a dramatic impact on food production throughout Spain. During their period of occupation, the Romans established villages as the production of crops intensified and became more extensive. The



Getty Images/UIG/Leemage

Ancient Greek wall painting featuring a fisherman with his catch

Romans also developed methods of food preservation, particularly salting and air-drying fish, which enabled the fishing industry to flourish. The Romans also introduced stone fruits, such as apricots and peaches, and lemons and melons into Spain.

The Moors, who arrived in Spain in 711 CE, were a nomadic people from North Africa. They remained in Spain for almost 700 years and had a significant influence on the food culture and cuisine of the region. The Moors introduced honey, citrus fruit, almonds and spices, including cumin and saffron, into Spanish cuisine.

Spanish explorers, particularly Christopher Columbus, also brought back many exotic new foods such as tomatoes, potatoes, corn (maize), peppers, chocolate and vanilla from their voyages across the Atlantic to the Americas in the late 1400s.

Geography and climate

The countries that surround the Mediterranean Sea, including Spain, share a climate that can have warm to hot summers and winters that are cool to mild. As a result of these climatic conditions, many of these countries often experience drought in the summer; conversely, they can experience periods of high rainfall in the winter. These climatic conditions are ideal for growing olives and grapes, and these crops became important in the early development of agriculture in Spain.

The Pyrenees Mountains run across the north of the country and divide Spain from France. Sheep and cattle grazing are widespread throughout the mountain plateaus. From the Pyrenees Mountains in the north and the Bay of Biscay to the interior valleys of Spain is a steppe-like climate. While these valleys have a typical Mediterranean climate, they have rich soils and are therefore important agricultural regions in Spain.

Religion

During the 800 years when the Moors dominated Spain, the Islamic faith was the predominant religion. At about the same time as the Moor occupation, Spain also had a significant community of Sephardi Jews. However, in the 1400s, Christian forces eventually took control of the country. The Roman Catholic Church became dominant, and Muslims and Jews were forced to convert to Catholicism. During this period, the Catholic Church introduced more than 200 days of fasting as a means of absolving themselves of sin. During periods of fasting, meat was replaced by salted cod, and believers were banned from eating a wide range of other foods. The Catholic Church also required those converting to Catholicism to eat pork to symbolise their loyalty to the Church and their rejection of their previous Muslim or Jewish faith.

Today, the majority of the Spanish population is Catholic, although many other religions are also practised, including Islam, Judaism, Protestantism and Hinduism.

Traditional foods of Spain

Spanish cuisine has been shaped by the influence of the Phoenicians, the Greeks, the Romans and the Moors, who all brought various ingredients, recipes and cooking techniques into the country.

Olive oil, a key ingredient in Spanish cuisine, was introduced by the Phoenicians, who planted the original olive trees in Spain in approximately 650 BCE. The Romans and Moors also cultivated and used olive oil during their periods of occupation. Today, Spain has over 300 million olive trees under cultivation and is one of the largest producers of olive oil in the world.

Rice, which was introduced by the Moors, is another important ingredient used in Spanish cuisine. Some rice-growing areas in Spain still use irrigation systems developed during the 700 years of Moorish rule. Calasparra rice, a Spanish rice highly prized for its plump grains that stay firm during cooking, is considered to be the best rice for making paella.

Paella, one of Spain's most famous dishes, is made from rice, onion, garlic, tomatoes, chorizo, shellfish, peas and beans. Paella is thought to have originated in Valencia, a major city on the eastern seashores of Spain. Paella is one of those dishes that can vary depending on the ingredients available. Some historians even suggest that paella was originally made from the leftovers of banquets held by Moorish kings.



Alamy Stock Photo/MBI

Paella

Another famous Spanish dish, gazpacho, a cold soup with a tomato and garlic base, was originally developed in the Andalusia region of southern Spain. Like many other famous Spanish foods and recipes, gazpacho is linked to the Romans and Moors. Historically, the soup was prepared by mixing stale bread, oil, garlic and vinegar together with a liquid.

The Spanish are also famous for their dry-cured ham called jamón serrano, which is thought to have originated with the Romans. Other important ingredients used in Spanish cuisine include chorizo sausage, seafood, cheese, eggs, garlic, beans and bread.

Churros, a batter-like dough that is usually deep-fried, is also thought to have originated in Spain. Some historians suggest that churros were developed by Spanish mountain shepherds who ate them plain for breakfast because they could not get freshly baked bread. Today, rather than being a plain breakfast food, churros are considered to be a sweet treat or dessert, rolled in cinnamon and sugar and may even be dipped in chocolate.



iStock.com/PGStudioja

Churros

Meal structure

In Spain, lunch or *almuerzo*, is the main meal of the day. The Spanish start their day with a light breakfast of coffee and a pastry. Lunch is a much more lavish affair and is eaten between 2 p.m. and 4 p.m. It includes a range of courses, starting with a light salad or soup. This is followed by a main meal of meat or fish and ends with a cake or Spanish flan. Traditionally, the Spanish would take a siesta following lunch, a tradition that originally allowed farm workers to rest out of the hot afternoon sun.

The Spanish eat dinner late in the evening, normally not before 9 p.m. Dinner is normally a light meal of salad or perhaps some tapas.

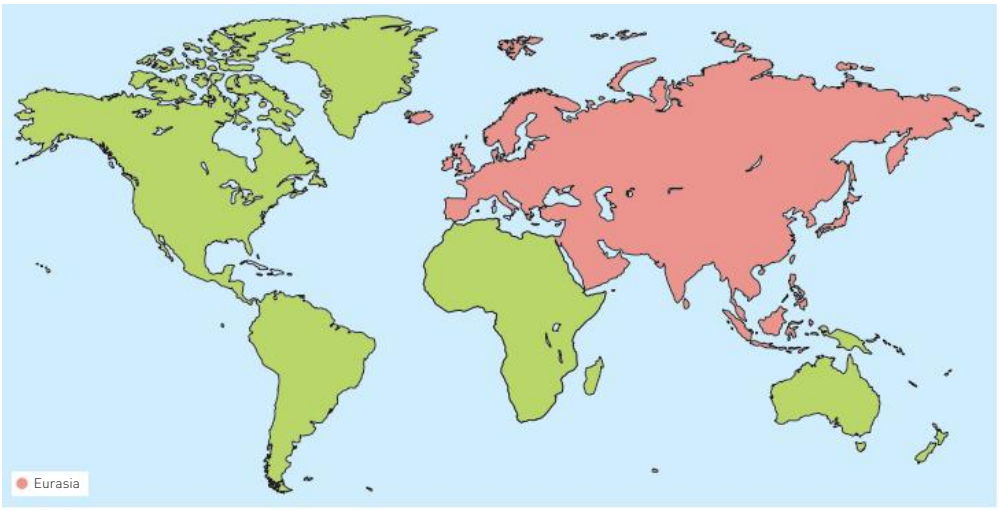
Eurasia

Eurasia is the large landmass that includes Europe and much of Asia. Geographically and politically, a number of the countries that are commonly associated with the Mediterranean region are also included as part of Eurasia. More than 100 countries are included in this region, for example, Greece, India, Indonesia, Italy, Malaysia, the Philippines, Portugal, Spain, Sri Lanka, Russia, the United Kingdom and Vietnam. Seventy per cent of the world's population lives in the countries of Eurasia.

DEVELOPMENT OF FOOD PRODUCTION AND FOOD CULTURE IN EURASIA

The landmass that makes up Eurasia lies along the temperate climatic zone, making it ideal for the development of agriculture. Archaeological evidence shows that agriculture in central Europe was established as a result of both migration and cultural assimilation. Farmers who lived on the eastern shores of the Mediterranean and Anatolia, migrated to central Europe and brought with them their knowledge and skills in agricultural production. As these practices became established, indigenous hunter-gatherer peoples who lived in more outlying communities in Scandinavia, the Baltic States, Russia and the Ukraine began to adopt many of these practices.

The development of agriculture throughout Eurasia was greatly influenced by both the Roman and Greek empires. The early Roman civilisation used agricultural produce for trade, both within the empire and for trade with other nations. The Romans grew a wide variety of agricultural produce – cereals



Eurasia

such as wheat, barley and millet; peas, beans and lentils; and fruit such as apples, pears and figs. The Romans also kept cows, sheep and goats for milk and cheese.

During the 5th century CE, the Greeks developed crop rotation systems and moved away from small, family-owned farms, which were the basis of the Roman agricultural system, to large estates.

REGIONAL INFLUENCES ON FOOD PRODUCTION IN INDIA

India is a key nation in Eurasia; with a population of more than 2.1 billion people, it is the second-largest population of any country in the world. India shares its land and sea borders with Pakistan, Afghanistan. China, Nepal, Bhutan and Bangladesh, Myanmar and Sri Lanka.

Like all other countries, its climate, geography and the numerous forces that have invaded the country over many millennia have shaped the food customs and cuisine of India.

The Himalaya Mountains form the northern border of India and have had a major influence on the food culture and cuisine of the country. Throughout its history, the rugged nature of the Himalaya Mountains has provided India with a strong defensive wall against invading forces. The snow-covered, high mountain passes have proved to be a natural barrier because they can only be crossed during the summer when the snow melts, thus restricting invading forces coming from the north.

There is a long history of agriculture in India, dating back to the 6th century BCE. Evidence shows that wheat, legumes and oranges were grown in the Indus Valley in north-west India during this period. By



India

the 4th century BCE, barley, peas, dates and mangoes were also cultivated. The rich alluvial soils from the Indus River were washed down from the Himalayas, providing fertile ground for crop growing. The people who inhabited this region developed a series of dams that were used for irrigation. As a result, they were able to successfully grow rice from about 3000 BCE. Other crops, such as tea, bananas, eggplant and apples, were also soon cultivated.

Aryan people, most probably from ancient Iran, invaded India from the north between 1500 and 1000 BCE, bringing with them spices such as cumin and coriander. However, one of the greatest influences on the food culture and cuisine of India has been the Mughals, a Muslim people from Persia. The Mughals (or Moguls), who dominated India for three centuries from 1500 CE, introduced a vast array

of spices, cashews, almonds, besan or chickpea flour and rosewater to the cuisine of India.

Geography and climate

The geography and climate of India are major influences on the food customs and cuisine of the country. India lies within the tropics and therefore has a tropical monsoon climate. The northern areas of India have a more temperate climate while the south is much hotter.

One of the key influences on the climate of India is the Himalaya Mountains. These mountains form a natural barrier, preventing the icy winds of central Asia from crossing into India. The monsoons that form in the Indian Ocean are also forced to shed their rain in the north of India, making this a more fertile agricultural area.

Melting snow from the Himalayas feeds into the rivers in northern India, enabling large irrigation systems to be established in these areas. The river also carries sediment from the Himalayas to the northern plains of India, providing the region with some of the world's most fertile soil.

Religion

India is the birthplace of two of the world's most important religions – Hinduism and Buddhism. Today, approximately 80 per cent of the Indian population is Hindu. The remainder of the population is made up of Muslims, Jains, Sikhs and Christians.

The cow is considered sacred in the Hindu religion and therefore most Hindus do not eat beef, and follow a vegetarian diet. Jainism, which arrived in India in 6000 BCE, also follows the principles of non-violence and therefore Jains are strict vegetarians. Sikhs are mainly found in the Punjab region of northern India and while some choose to follow a vegetarian diet, this not a requirement of the Sikh religion.

Meal structure

Traditionally, Indian families would sit on the floor to eat their meals; however, today many families follow the Western custom of sitting at a table. Most Indian families have three or four meals a day. Throughout the country it is usual for Indians to use the fingers of their right hand to eat their food. They always ensure that they wash their hands and mouth before they begin to eat.

Indian dishes, such as rice, curries, vegetable dishes and all of the condiments, are served in small bowls that are all placed on the table for family members to help themselves. In the northern and north-western states, a flatbread such as chapati made from wheat is served at most meals. In these regions, diners break off a small portion of the bread and use it to scoop up the food. In the southern and eastern states, rice is commonly served as the staple food of every meal, topped with dahl or other dishes such as curries. Diners use their fingertips to make a small ball from the food so that they can easily pop it into their mouth.

Traditional foods of India

The food culture and cuisine of India is largely determined by the religion of the people and the area in which they live.

The cuisine in the northern areas of India is heavily influenced by the Punjabi and Mughals. Here, wheat is used in preference to rice, and breads such as naan, parathas, chapatis and roti are eaten with almost every meal. Ghee, a clarified butter, is widely used for cooking, and dishes are often enriched with cream. Warm spice mixes are used to flavour foods, rather than hot chilli flavours. Tandoori is a cooking style common in the north of India.

In central India, vegetarian dishes are more common and rice is a staple dish of the region. The vegetarian dishes are spiced with cumin, coriander, turmeric, curry leaves and chilli. Fish is a key ingredient along the coastal regions of central India. In other regions of central India around Hyderabad where the Mughals were influential, meat is more widely eaten.

The cuisine of the southern states of India is based on more vegetable and rice dishes. The food here is much lighter and uses a wide range of fresh ingredients. Chilli is widely used in the south, along with coconut milk and freshly grated coconut. Pulses and legumes are made into dahl or ground into flour for pappadums. Fresh fish and seafood are also widely used in the cuisine of the southern states of India.



Alamy Stock Photo/Iain Stuart McGregor

Tandoori chicken is a popular dish in northern India.

Understanding the text

11 Draw a timeline of the key stages in the development of food production in Spain from 1000 BCE to 1500 CE.

12 Explain how the geography and climate have influenced the development of food production in Spain.

13 Outline three points to summarise the impact of Roman Catholicism on the food habits of the inhabitants of Spain.

14 Explain how olive oil and rice became key ingredients in Spanish cuisine.

15 Draw a flow chart similar to the one below to demonstrate the meal pattern followed by most Spanish citizens.



16 Explain how both the Roman and Greek empires influenced the development of food culture in Eurasia.

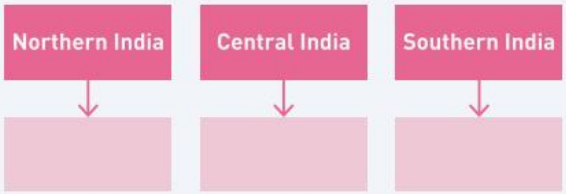
17 Prepare a PMI (plus, minus, interesting) chart on the regional influences on food production in India.

REGIONAL INFLUENCES ON FOOD PRODUCTION IN INDIA		
Plus	Minus	Interesting

18 Outline the differences in the food rituals of the Indian religions of Hinduism and Jainism.

19 Outline four key characteristics of the meal structure of most Indian families.

20 Draw a diagram like the one that follows to summarise the differences in the food of the north, central and southern states of India.



East Asia and Oceania

The countries that make up East Asia include China, Indonesia, Japan, North Korea, South Korea, Mongolia and Taiwan. The region of Oceania centres on the islands of the Pacific Ocean and includes Australia, Fiji, New Zealand, Papua New Guinea and the islands of Polynesia and Micronesia.

DEVELOPMENT OF FOOD PRODUCTION AND FOOD CULTURE IN EAST ASIA AND OCEANIA

The development of food production in East Asia and Oceania, like that of Eurasia, began as communities became more settled. Throughout Mongolia and north-eastern China, millet seems to have been cultivated by 8000 BCE. Like other communities, early agricultural production in China took place beside rivers and lakes that could provide a reliable water supply. This was particularly important in the development of cultivated rice, as fields close to the water would be inundated during wet seasons. By 600 BCE, Chinese farmers were growing millet and wheat using a crop rotation system. The Chinese introduced rice into Korea in 4000 BCE.

In the region of Oceania, evidence shows that Papua New Guinea was a centre for early agricultural production. In approximately 11 000 BCE, Papua New Guinea communities began to deliberately grow taro, making it one of the earliest cultivated food crops. Banana and sugar cane production also developed around 6500 BCE.

REGIONAL INFLUENCES ON FOOD PRODUCTION IN JAPAN

Japan is a nation of East Asia that is made up of approximately 6000 islands in the Pacific Ocean. The four largest islands are Honshu, Hokkaido, Kyushu and Shikoku.

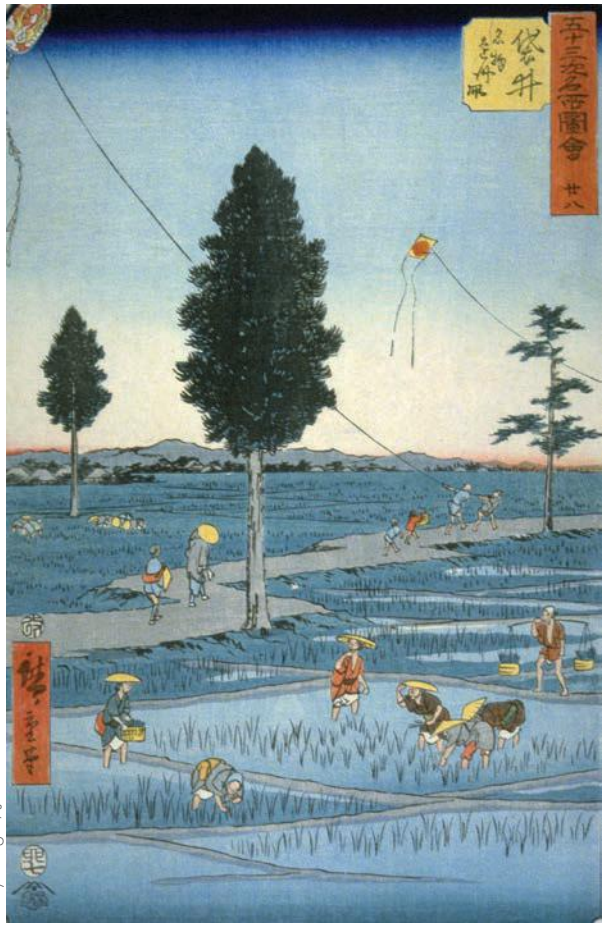
Archaeological evidence shows that the Japanese began to cultivate millet by about 4000 BCE. Some of the earliest influences on Japan appear to have come from Korea. Rice, a staple food crop of Japan today, appears to have been brought into the country by tribes migrating from Korea in about 2500 BCE. The Koreans introduced paddy agriculture into Japan during this period. At this time, the Japanese started growing wheat, barley, soybeans, adzuki beans, peaches and persimmons. The Chinese also influenced the food culture of Japan, introducing chopsticks, tofu and soy sauce.



Japan



East Asia and Oceania



Getty Images/John Stevenson

Wet rice farming in ancient Japan

By 1200 CE, trade with other countries had increased and a range of new foods was introduced into Japan. The use of tempura batter, a cooking method now synonymous with Japanese cuisine, was introduced by the Spanish, and potato, sweet potato and corn were brought to Japan by the Dutch.

Geography and climate

One of the most important geographical features of Japan is that it is an island nation surrounded by the Sea of Japan, the Sea of Okhotsk and the East China Sea. The Sea of Japan separates the country from the mainland of Asia and has acted as a barrier to most invading forces for much of its history. However, Japan's close proximity to the Korean Peninsula has meant that many trading vessels used this as a route between Japan and Korea, China and even Siberia. As Japan is surrounded by water, the early Japanese became expert fishers so fish became an important part of Japanese cuisine.

The islands that make up Japan are generally quite mountainous and take up more than 70 per cent of the total land area. This has meant that the only land suitable for agriculture in Japan is around the lower levels of its many mountains and hills. As arable land was in such short supply, the Japanese carved terraces into the mountainsides so that they could build paddies for growing rice.

The climate of the northern islands of Japan varies greatly from those in the south. In the north, the islands have a cool temperate climate while the southern islands are more subtropical. Rice growing is mainly confined to the south of Japan where the weather is hot and wet during the summer months. The mild, more temperate climate of the northern islands of Japan is more suited to growing vegetables and fruit. The prized Japanese green tea is mainly grown on the islands of Shikoku and Kyushu. These islands have a humid climate that is moderated by sea breezes. The main island of Hokkaido and the northern part of Honshu are too cold to produce tea.

Religion

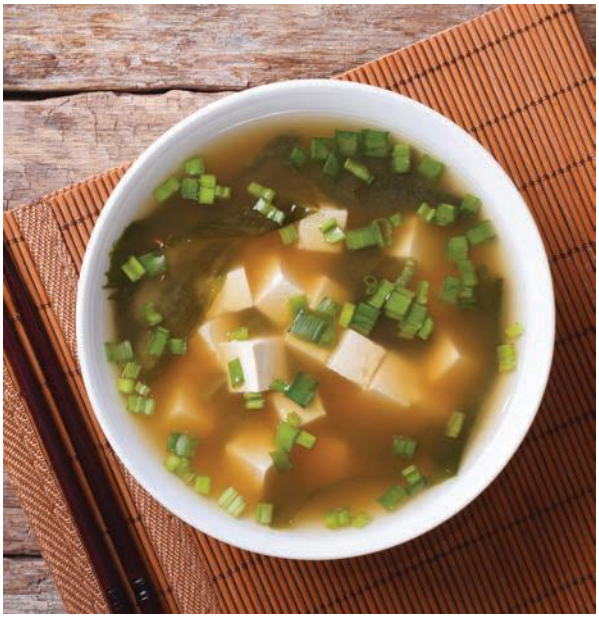
The Japanese follow two main religions: Buddhism and Shintoism. Buddhism arrived in Japan from China in the 2nd century BCE. In 700 CE, followers of the Buddhist religion were banned from eating meat. Instead they began to eat rice with raw fish, a dish that today is called sushi. Many Buddhist monks follow a vegan or vegetarian diet, but other Buddhists regularly eat meat depending on their sect.

The Shinto religion is an ancient Japanese religion. It has coexisted along with Buddhism throughout Japan's history. Like Buddhists, followers of Shintoism do not eat meat. Many of the vegetarian dishes associated with Japanese cuisine are attributed to the influence of Shintoism.

Traditional foods of Japan

The Japanese prefer to use fresh ingredients in their meal preparation and normally shop daily. They also like to use ingredients that are in season and look forward to the change of seasons and the new ingredients they bring. The Japanese consider there to be six flavours – bitter, sour, sweet, hot, salty and umami.

Rice and noodles are staple ingredients in Japanese cuisine. Steamed or boiled rice forms the basis of every meal, as does miso soup. The Japanese eat a variety of noodles, for example, soba noodles made from buckwheat flour, and udon and ramen noodles made from wheat flour. Fresh fish forms a very important part of Japanese cuisine and is eaten either raw in sushi or sashimi, or it may be grilled. Other staple Japanese foods include fresh tofu, soy sauce, pickled vegetables, ginger, seaweed, bamboo shoots, daikon and sesame seed products. Sushi, a dish made with rice and raw, fresh seafood, and sashimi, thin slices of raw fish, are popular Japanese dishes. Nori, an edible seaweed used to make sushi, dates back to the 8th century CE. Gyozas, dumplings made with ground meat and vegetables and wrapped in a thin dough, are another popular Japanese food.



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Miso soup

Activity 2.3

Cooking with tofu

Miso soup is a traditional dish of Japan. The Japanese serve miso at breakfast and lunch, and may include it as a first course at dinner. Miso paste, a key ingredient in the soup, is made from fermented soybeans and salt. The flavour of miso paste varies in intensity – red miso has a strong, deep flavour; white miso has a much lighter, sweeter flavour.

Worksheet

Method

1. Work with a partner to prepare one quantity of miso soup (serves 1–2) using the recipe that follows.
2. Prepare one quantity of a commercially available instant miso soup.
3. Undertake a sensory analysis of the appearance, aroma, flavour and texture of the two types of miso soup. Write up your sensory analysis using technical terminology.
4. After tasting each of the products, rate them using a facial hedonic descriptor (see page 24).
5. Which type of miso soup did you prefer? Justify your answer by discussing the sensory properties and the time taken to prepare each type of soup.

	HOMEMADE MISO SOUP	COMMERCIAL INSTANT MISO SOUP
Appearance		
Aroma		
Flavour		
Texture		
Hedonic descriptor		

Miso soup

2 centimetres fresh ginger, peeled and finely sliced
3 cups water
1 rounded tablespoon red miso paste
100 grams udon noodles
⅓ bunch baby bok choy, washed and finely sliced
4 shiitake mushrooms
2 teaspoons mirin
100 grams silken tofu, cut into 2-centimetre cubes
1 spring onion, finely sliced

Method

1. Place the finely sliced ginger, water and miso paste into a medium-sized saucepan and bring to the boil.
2. Reduce the heat to low, cover with a lid and simmer for 5 minutes.
3. Add the udon noodles, bok choy, mushrooms and mirin. Cover and simmer for a further 5 minutes.
4. Add the tofu cubes. Turn off the heat and allow to stand for 1 minute.
5. Serve the miso soup topped with the finely sliced spring onion.

Meal structure

The Japanese, like many people of other cultures, eat three meals a day. Breakfast is generally a light meal of miso soup, rice and sometime an egg or grilled fish. At lunchtime, many workers have a bowl of noodles or a bowl of broth flavoured with vegetables, fish or seaweed. Bento boxes, which include small portions of rice, vegetables, fish or meat, are also popular for lunch.

Dinner might be a more substantial dish such as chicken teriyaki or beef sukiyaki served with rice. The Japanese serve individual portions of food to each diner. Small serves of each course are placed in an individual bowl and rice is also served in its own small bowl to accompany the main dish. All meals are eaten with chopsticks.



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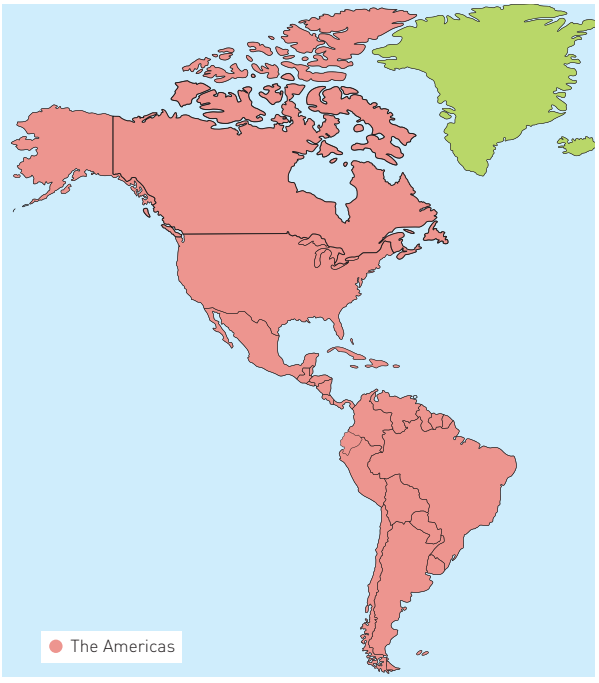
A bento box

The Americas

The Americas includes all of the countries that make up the landmass of North America, Central America and South America. The United States of America, Canada and Mexico make up North America. Central America is the narrow strip of land that links North America to South America, where Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama are located. South America is a large continent that lies mainly in the Southern Hemisphere with 12 nations – Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Guyana, Paraguay, Peru, Suriname, Uruguay and Venezuela. The Caribbean Islands, including Cuba and Jamaica, are also considered to be part of the Americas.

DEVELOPMENT OF FOOD PRODUCTION AND FOOD CULTURE IN THE AMERICAS

Archaeological evidence suggests that the development of various methods of food production throughout the Americas occurred at various times. Early agricultural development seems to have begun in South America in approximately 5000 BCE when



The Americas

potatoes were first cultivated. Quinoa, lima beans, squash and peanuts were also grown specifically as a food in many regions of South America.

Corn, beans, chilli peppers, squash and cocoa were also being cultivated in Central America in approximately 4000 BCE. The people of Central America developed irrigation systems to produce crops that could support the large communities that were being established.

In approximately 3500 BCE, corn, gourds and squash were cultivated in North America by early Mexican communities. Corn seems to have been cultivated in the south-west of North America in about 3200 BCE. In approximately 2500 BCE, indigenous tribes in north-eastern North America cultivated sunflower, squash, amaranth and other seed plants. By 1600 BCE, corn was being grown in some parts of Canada.

REGIONAL INFLUENCES ON FOOD PRODUCTION IN PERU

Peru lies on the Pacific Ocean in western South America. Its neighbours include Ecuador, Columbia, Brazil, Bolivia and Chile.

One of the oldest civilisations in the Americas was established on the north-central coast of Peru in approximately 5000 BCE. Although archaeological records are unclear, agricultural production seems to have begun in this region not long after. These early inhabitants were mainly fishers, who cultivated cotton, beans, corn and squash. They use the cotton to make fishing nets and fishing lines and the gourds were used as floats to mark their lines. Later, the early Peruvian communities moved into the fertile river valleys where there was more suitable land for their developing agricultural production, especially for growing crops such as corn.

The empire of the Incas was established in the Andes Mountains in south-eastern Peru in 1200 CE. The Incas are renowned for the development of a sophisticated agricultural system and an extensive series of roadways. They were very proficient farmers who grew corn, quinoa, potatoes and squash. They were ingenious and built irrigated terraces on the mountainsides to maximise the amount of land they had available for growing their crops. Remains still exist of special warehouses they built to store their corn and potatoes. The Incas also domesticated llamas and alpacas and used them as pack animals to transport goods between villages.

The arrival of the Spanish conquistadors in early 1532 CE led to the demise of the Inca Empire. The Spanish, with the help of indigenous tribespeople overthrew the Incas. The Europeans introduced exotic diseases, such as smallpox and measles, which wiped out more than half the Inca population. The Spanish introduced a variety of meats previously unknown in Peru, including chicken, lamb and pork, and took potatoes and chillies back to Spain. The Spanish also established new crops not previously cultivated in Peru, such as wheat, barley and beans.



Peru

Geography and climate

The climate of Peru is affected by its location on the Pacific Ocean, the Andes Mountains and its tropical latitude. The climate of Peru is described as tropical, with both wet and dry seasons.

The Andes, one of the longest mountain chains in the world, extends along the western seaboard of South America. The Central Andes that runs through Peru is very dry, particularly on the lower slopes, but receives more rainfall in the higher regions. In the higher regions, where the rainfall was more reliable, ancient communities grew a variety of crops. The coastal areas of Peru are quite arid and little agricultural development was possible in these areas. Instead, the cold ocean currents that run along the

coast of Peru provided a great source of fresh fish to communities that lived in the coastal regions.

The Amazon basin in the east of Peru is an area of dense rainforest. However, while it supported small indigenous communities, the rainforest was too extensive and dense to allow for large-scale agriculture.

Religion

The arrival of the Spanish in Peru in 1532 brought the Catholic religion to the country. Today Catholicism is the main religion in Peru, although there is a blend of ancient indigenous beliefs. Most Peruvians pay respect to the Pachamama or Mother Earth, a goddess revered by the indigenous tribes of Peru for her generosity during the year.

The Roman Catholic community in Peru follows the same traditions as other Catholics throughout the world during Easter, Christmas and All Saints' Day. However, many of their religious celebrations coincide with traditional festivals held by the indigenous community.

Traditional foods of Peru

The cuisine of Peru is based not only on those foods that are indigenous to the country such as potatoes, quinoa and corn, but also on the foods that are synonymous with Spain. Peruvian foods are often quite spicy and chilli is a common ingredient in many dishes. Other herbs and spices such as mint, basil, oregano and parsley are also used to flavour soups and stews. Rice, beans, guinea pigs and fish are staple foods in Peru.

Potatoes, another staple food of Peru, are indigenous to the Andes. Evidence shows that potatoes were grown in this region in about 400 BCE. It is believed that more than 2500 varieties of potatoes are produced in Peru. Avocados also have an ancient history in Peru and archaeological sites show evidence of avocados from about 750 BCE.

Quinoa, a staple food of Peru, is thought to have been first cultivated approximately 3000 years ago. It is believed to have originated around Lake Titicaca on the border of Peru and Bolivia. Quinoa is prized for



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Quinoa is a staple food of Peru.

its nutritional properties, particularly as it is gluten-free and high in protein and dietary fibre. Quinoa also contains folate, iron, zinc, magnesium and calcium. Today, half the world's quinoa is produced in Peru, where it is an important commodity.

Meal structure

The meal structure of Peru is similar to that of Spain. Peruvians start their day with a simple breakfast called *desayuno*, often simply bread served with butter, ham or jam. In the villages, the people might eat a dish of boiled, dried corn called mote. In Peru, lunch or *almuerzo*, is the main meal of the day, as it is in Spain. In the country, farm workers may have a substantial meal of a thick soup made with potatoes, corn and barley, followed by a vegetable, avocado and chilli dish. In some areas, Peruvians have a siesta in the afternoon and return to work at about 3 p.m. Dinner or *cena*, is often served quite late, usually after 8 p.m. Peruvians who live in the highlands might have a meal based on potatoes or corn, while city dwellers normally have a simple meal of bread with ham, cheese, olives or eggs.

Understanding the text

21 Draw a timeline of the key stages in the development of food production in East Asia and Oceania from 8000 BCE to 600 BCE.

22 Outline three key regional influences on food production in Japan.

23 List three ways in which Japan's island status has influenced the availability of food to the Japanese people.

24 Explain how the differing climates in the north and south of Japan have influenced the types of food grown in these regions.

25 Explain why rice, noodles and fish are considered essential ingredients in Japanese cuisine. Use examples to support your answer.

26 Draw a timeline of the key stages in the development of food crops in the Americas.

27 Prepare a list of four interesting facts about the agricultural development by the Incas.

28 Explain how Andes Mountain range influences the climate of Peru.

29 What is quinoa and why is it considered to be an important food?

30 Draw a diagram to highlight the foods that the people of Peru would eat for *desayuno, almuerzo* and *cena*.

THINKING SKILLS

1 Prepare a table like the one that follows to compare the characteristics of the development of food in three world regions.

Worksheet

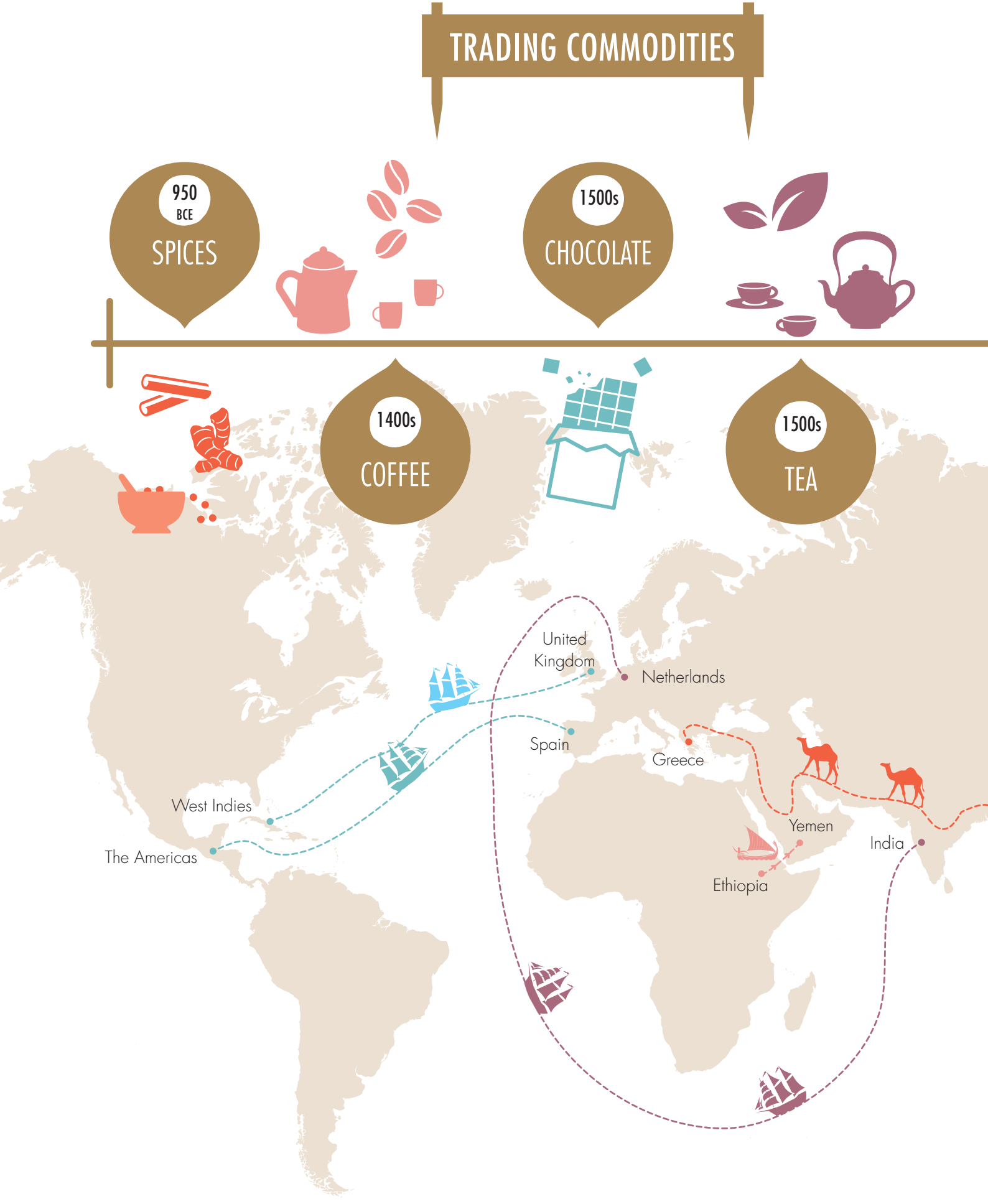
2 Select three of the world regions that you have studied in this chapter.

3 Complete the summary table, explaining the key information of each characteristic in the world regions.

4 Summarise your findings and discuss how the characteristics are similar and different in the three regions you have selected.

5 Draw a conclusion about the main characteristic(s) that have influenced the development of food culture and cuisine across the globe.

	REGION 1	REGION 2	REGION 3
Geography and climate			
Religion			
Traditional foods			
Meal structure			


TRADING COMMODITIES
950 BCE
SPICES
1500s
CHOCOLATE
1400s
COFFEE
1500s
TEA
United Kingdom
Netherlands
Spain
Greece
West Indies
The Americas
Yemen
India
Ethiopia

3

GROWTH OF AGRICULTURE AND TRADE



KEY TERMS

Spices are seeds, flowers, bark, roots, berries and fruit that are used as flavouring ingredients in food, medicines, perfume and incense.

Sugar is produced from both sugar cane and sugar beet.

Wheat, corn (maize) and rice are important cereal crops grown in various regions throughout the world.

Wild einkorn and emmer are ancient varieties of wheat.

Patterns in the global spread of food production and trade

From as early as 10 000 BCE, humans began the transition from a hunter-gatherer lifestyle towards cultivating and domesticating crops and animals. The development of agriculture made it possible for a more settled lifestyle and set humans on the path to the modern world.

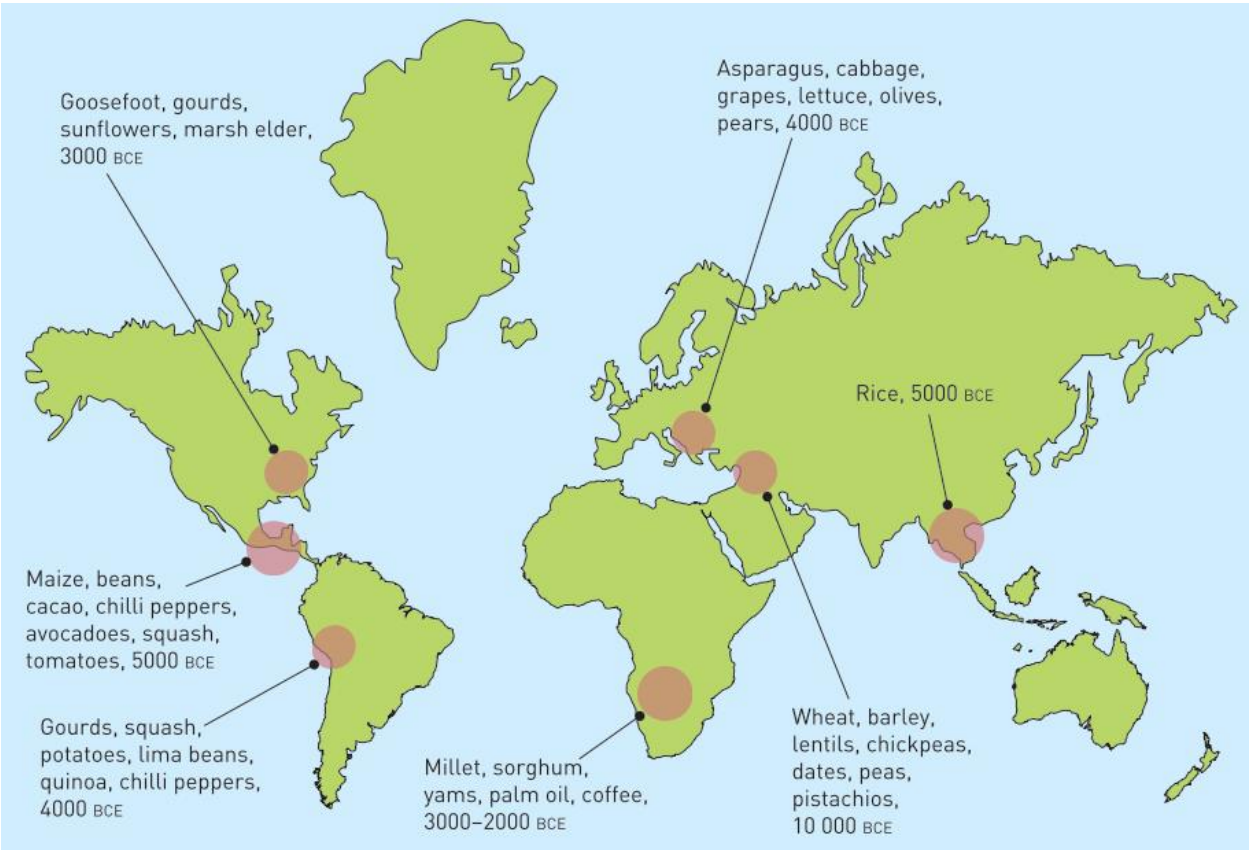
Wheat and barley were originally grown in the Fertile Crescent in the Middle East; millet and rice were grown in Asia; and corn (maize) and potatoes were the main crops grown in the Americas. Later, fruit trees were cultivated and vegetables and other crops followed. By 5000 BCE, agriculture was practised across most continents and the animals we know today were domesticated by 6000 BCE. Agriculture became a driving force in the growth of civilisation.

GROWTH OF TRADE IN FOOD COMMODITIES

Once civilisations began to emerge in different parts of the world, food helped make connections between different cultures. Trade routes acted as international communications networks and helped link people, fostering not just a commercial exchange of food, but also an exchange of cultural and religious ideas.

The trade in food, and especially in spices, led to the establishment of shipping routes, and eventually to the discovery of the Americas or the 'New World'. New shipping routes facilitated trade between world regions, including Europe, Asia and the Americas. These new trade routes also led to the establishment of European colonies and colonial outposts.

As people moved around the world and seafaring explorers such as Christopher Columbus and Vasco da Gama returned home from their voyages, they brought with them new seeds for crops, exotic spices and different types of animals. Agriculture and livestock production began to spread across the globe.



Where the first agricultural crops were grown

A primary reason for the exploration and colonisation of new lands was to gain access to raw materials and agricultural products that could not be produced in explorers' home countries. Another reason for adding territories was to find new markets for the country's own produce.

The discovery of America in 1492 by Christopher Columbus and the opening up of a sea route from Europe to India by the Portuguese explorer Vasco da Gama in 1498 ensured the establishment of trade routes to the Far East. In 1595, a Dutch convoy returned from India with spices and East Indian products. The success of this convoy led to the establishment of the Dutch East India Company in 1602.

One of the most important developments in the trade and exchange of plants and animals across the globe was the Columbian Exchange or Grand Exchange. This trade began with Christopher Columbus, who is believed to be directly responsible for two of the most important exchanges of food crops with the Americas. The first took place in 1492 when Columbus arrived on the island of Cuba and saw fields of corn (maize) growing. Columbus took some of the corn seeds back to Spain and by the 1520s, corn was a valuable crop in both Spain and Portugal. From there, corn soon spread through countries in the Mediterranean and Central Europe. On another voyage in 1493, Christopher Columbus recognised that the climate in the new lands, particularly in Hispaniola in the Caribbean, would be suitable for growing sugar-cane seedlings.

Grains

Three domesticated plants – wheat, corn (maize) and rice – are of great significance in the development of agriculture as they laid the foundations for civilisation and continue to be a valuable food source for humans to this day. **Wheat, corn (maize) and rice** are important grain crops grown in various regions throughout the world.

CORN (MAIZE)

Farmers in ancient Mesoamerica (modern-day Mexico) were the first to domesticate and cultivate corn. The cultivation of corn soon spread into the southern states of America and south to Peru. As the Mesoamerican people migrated north to present-day North America, they took corn with them. When European explorers such as Christopher Columbus made contact with people living in North and South America they collected corn seeds and took them back to Europe. Corn is now the most widely cultivated crop in the world.



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Corn ready for harvest

RICE

Rice is the second-most important cereal crop grown throughout the world and was first domesticated in the Pearl River valley of China. From East Asia, rice spread to South-East Asia and southern Asia, and was introduced to Europe through western Asia and to the Americas through European colonisation. Chinese gold prospectors bought rice seeds to Australia around 1850.

WHEAT

Wheat was one of the first grains to be domesticated and it was originally grown in an area known as the Fertile Crescent in 10 000 BCE (see chapter 2, page 20). **Wild einkorn and emmer** wheat varieties were cultivated in ancient times by selective breeding from wild and cultivated grass varieties. The cultivation of wheat began to spread beyond the Fertile Crescent during the Neolithic period, about 10 000 BCE, and by about 3000 BCE had reached Ethiopia, India, Ireland and Spain. The spread of wheat occurred as people migrated to other countries, taking wheat seeds with them. As they established new farming communities in different parts of the world, the cultivation of wheat spread. Today, wheat is the third most cultivated cereal crop and is grown in many countries throughout the world.

Growth of trade in grains

The trade in grains such as wheat, corn and rice can be traced back to the ancient world. The movement and growth of the grain trade began with corn in



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Rice growing in terraced paddies



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Wheat ready for harvest

Mexico, rice in ancient China and wheat and barley from Egypt, Syria and Jordan. Between 1000 BCE and 600 CE, cereals became an important commodity in China. During this period, the Romans also introduced cereals into the Mediterranean region. These two developments enabled cereals to spread throughout Eurasia.

The expansion of the wheat industry and the trade in wheat grew enormously with the British colonisation of America in 1492 and Australia in 1788. Following colonisation, large areas of land were developed for wheat production and wheat became a key trading commodity in both countries. Similarly, Russia opened up large tracts of land for the cultivation of cereals, and it too has become a major cereal trader.

The development of the railways and steamships meant that grains could be traded from local areas to international markets, and grain growing and trading expanded further. Grain elevators and silos were built near railways and ports to store the grain after harvest, ready to be moved to flour mills or to international ports for trade.

Between the 15th and 20th centuries, tariffs and free trade in grain was fierce and farmers encouraged governments to give them a higher price for their grain to protect them from cheap imports. Today, farmers in the European Union, the United States of America and Japan benefit from agricultural subsidies that protect the sales of local grain from cheaper overseas imports.

Unlike corn and wheat, rice was traditionally consumed in the countries where it is grown. However, today international trade in rice has increased because many countries are not able to produce sufficient rice for their rapidly increasing populations, so they rely on imported rice. The main exporters of rice are India, Thailand and Pakistan. The main importers of rice in the world are China, Nigeria, Iran and the Philippines.



iStock.com/tfoxfoto

Grain is shipped around the world in huge container ships.

Understanding the text

1 Draw a simple timeline to demonstrate the early spread of agriculture across the globe.
2 Why was the discovery of new shipping routes an important factor in the growth of trade?
3 Outline the key reasons for exploration and colonisation of new lands.
4 Why was the Columbian Exchange or Grand Exchange so important in the spread of trade?
5 Describe how the production of corn spread throughout the world.
6 Outline the role of Christopher Columbus in the spread of corn across the globe.
7 Draw a flow chart to demonstrate the spread of rice across the globe.
8 Explain how the early varieties of wheat were domesticated and cultivated.
9 Describe the way in which wheat spread across the globe.
10 Draw a flow chart to demonstrate the development in the global trade in grains.

Tea and coffee

The drinking of both tea and coffee is steeped in history. Tea drinking appears to be a much more ancient art than coffee drinking, preceding coffee drinking by some 3000 years.

TEA

The cultivation of tea began in China and legend has it that in 2737 BCE the Chinese Emperor accidently discovered tea when he was sitting beneath a tea plant, *Camelia sinensis*, when some leaves from the plant blew into the bowl of hot water that he had been drinking. Tea drinking became well established in China and spread to Japan where the tea ceremony became an important part of Japanese culture. By the 6th century CE, tea drinking had spread to Asia and to the Middle East. In the latter part of the 16th century, tea drinking was first mentioned in Europe.

Growth of trade in tea

International trade in tea from China began to emerge in the late 16th century. The Portuguese established a trading centre in Macau where the sale and purchase of tea was a major activity. It took another 50 years for the Dutch to establish trading routes and a trading post in Java, Indonesia. It is from here that the first tea made its way back to Europe and was shipped to Holland by the Dutch East India Company. In 1600, Queen Elizabeth I founded the English East India Company to ship Chinese tea to England. The drink became fashionable and soon spread throughout Europe. British colonisers took tea to North America, India and Australia in the 18th and 19th centuries. When the First Fleet sailed to Australia they had on board several cases of tea. Today, tea is a global commodity, with China, India, Kenya and Sri Lanka the main exporters.



Bridgeman Images/Pictures from History

Preparing for a Japanese tea ceremony

COFFEE

The first coffee plants or *kafa* were discovered in Ethiopia in about 800 CE. Legend has it that an Ethiopian goat herder, Kaldi, discovered the berries from the coffee plant when tending his goats. This 'magical' plant was boiled in water and the resulting liquid was thought to have medicinal properties. Coffee drinking was quickly spread by the pilgrims of Islam through to the Arabian Peninsula and, in the 14th century, to Yemen near Saudi Arabia. Yemen's climate and fertile soil offered ideal conditions for cultivating coffee. The Ottoman Governor of Yemen introduced coffee to Turkey in 1555. Through merchants and travellers to Turkey, coffee soon spread to Europe and became a popular drink in Italy, France, Austria, the United Kingdom, Holland and Germany. Coffee reached the Americas in 1668. The Dutch planted coffee saplings in Java, the French in the Caribbean Islands, the Portuguese in Brazil and the English in Jamaica. By the 19th century, coffee had become one of the most important commodities in world trade.



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Coffee beans being picked

Activity 3.1

Taste-testing coffee

Aim: To compare the sensory properties of different types of coffee

Method

1 Taste-test a range of different types of coffee, including:
   - plunger coffee made from coffee grounds
   - a coffee bag
   - instant coffee
   - coffee essence with chicory.

2 Focus on the properties of appearance, aroma, flavour and texture of each type of coffee. Record your results in a table like the one that follows.

3 Rate each type of coffee on a scale of 1 (dislike very much) to 9 (like very much). Score 5 if you neither like nor dislike the flavour.

Results

SENSORY PROPERTIES	PLUNGER COFFEE MADE FROM COFFEE GROUNDS	COFFEE BAG	INSTANT COFFEE	COFFEE ESSENCE WITH CHICORY
				
RESULTS				
Appearance				
Aroma				
Flavour				
Texture				
RATINGS				
1 = dislikes very much 5 = neutral 9 = likes very much				

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Analysis

Describe the similarities and differences in the sensory properties of the four types of coffee. What could be the reasons for these differences?

Conclusion

Which types of coffee did you prefer? Justify your decision.

Growth of trade in coffee

Coffee is believed to be the second-most globally traded commodity today after oil. Coffee was initially traded in the Middle East between Ethiopia and Yemen. The Venetians brought coffee to Europe through their trade with the Muslims in North Africa and Egypt. Coffee seems to have arrived in the United Kingdom in about the 16th century through the then British East India Company and the Dutch East India Company. Coffee drinking soon spread across London, and more than 3000 coffee houses were established. The first coffee arrived in the capital of Austria, Vienna, in 1683 and coffee soon became a popular drink when

the Viennese combined it with milk and sugar. Later, coffee spread to other European countries including France, Germany and the Netherlands.

According to the International Coffee Organization, the demand for coffee is currently strong, with an export market of 68.48 million bags in 2015. The economy of Ethiopia, for example, relies greatly on export and trade in coffee. Coffee is Ethiopia's largest export commodity and generates 60 per cent of its export earnings. Ethiopian coffee is exported to countries such as Italy, the United Kingdom, the Netherlands, Germany, Saudi Arabia, France, the United States and Japan.

Spices, sugar and chocolate

Spices, sugar and chocolate are three commodities that have been desired by people across the globe for thousands of years. Spices have been a global commodity throughout human history, and their trade became one of the world's biggest industries. Sugar and chocolate were also products that were greatly desired and became important products that quickly spread across the globe.

SPICES

The word 'spice' comes from the Latin word meaning 'special' and denotes a valuable or luxury item. **Spices** are seeds, flowers, bark, roots, berries and fruit that used mostly as flavourings in food. Today, spices are plentiful, but in ancient and medieval times, they were rare and precious products, used for flavouring food and in medicines, perfume and incense. The Egyptians used spices such as anise, mustard, saffron and cinnamon as medicines and to embalm bodies before burial.

In India, spices, particularly indigenous spices such as cardamom and turmeric, were cultivated and used as early as the 8th century BCE. The Indians used many of these spices to ward off evil spirits and as medicines to heal wounds. In the 3rd century BCE, Chinese courtiers carried cloves in their mouths to make their breath fresh when speaking to the Emperor. The Arabs began trading spices in the 1090s and used spices for flavouring and syrups.

The Greeks are believed to have pioneered the use of culinary spices in the cooking of food in Europe. Spices also played an important role in ancient Greek medical science and Hippocrates, a Greek physician often considered to be the founder of medicine, wrote about important spices for medical use. By the Middle Ages, food was being covered in spices, often to mask the aroma and taste of rotting food. Throughout Europe, peppercorns were used as a substitute for money and were counted out to pay taxes and rent; many towns kept accounts in pepper. This trading practice is the origin of the term 'peppercorn rent'.

Growth of trade in spices

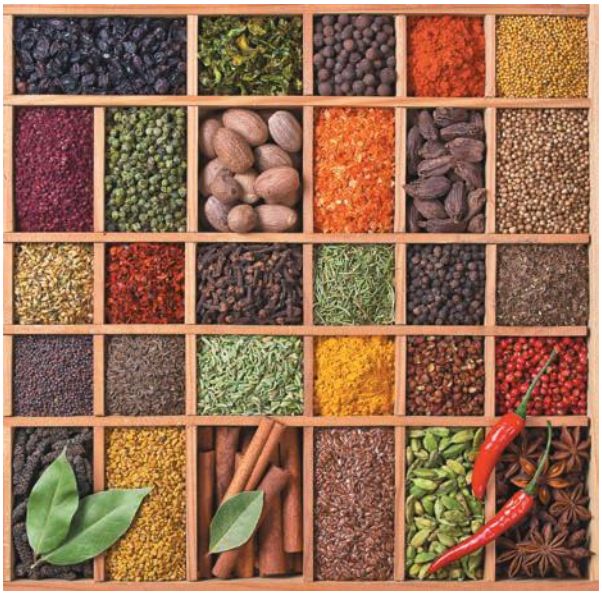
In the ancient world, the domestication of camels made it possible to undertake long-distance trade, particularly in spices. The Egyptians used camels to develop trade routes in the region of the Red Sea, importing spices from Arabia. The Silk Road, an overland route that linked eastern nations with those of the Mediterranean, was established and allowed goods to be transported from China to India and on to the Roman Empire.

Pepper, along with other spices such as cinnamon, cloves and nutmeg, was such a valuable commodity five centuries ago that it drove nations to sail across vast oceans searching for new routes to the spice-rich Orient. Trading spices helped to establish vast empires, as well as make merchants rich, and opened up new continents to Europeans, tipping the balance of world power.

When Alexander the Great conquered Egypt in 80 BCE, he established the Egyptian port of Alexandria to use in the spice trade. After the 1st century CE, Rome established a direct trade with India via the Red Sea, and effectively broke the Arab monopoly on the spice trade.

In the 5th century CE, a 25 per cent duty was payable on spices including cinnamon, cassia, ginger, white pepper and cardamom. This import duty was payable at Alexandria, the main city through which the spices flowed into the Mediterranean and on to Europe. Early Romans expanded the use of spices in foods, medicines and luxury items such as lotions and perfumes. During these times, large amounts of gold and silver were traded for spices. This made spices a highly desirable commodity and including them in the menu was a way to demonstrate wealth and power.

The pursuit of spices was a motivating factor for the early European explorers such as Christopher Columbus and Vasco da Gama as they sought access to the Indies and established rival trading empires. The development of newly discovered sea routes led them to the Maluku (or 'Spice') islands, an archipelago of islands in Indonesia that



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Spices became a valuable trading commodity.



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A 15th-century depiction of a cinnamon vendor

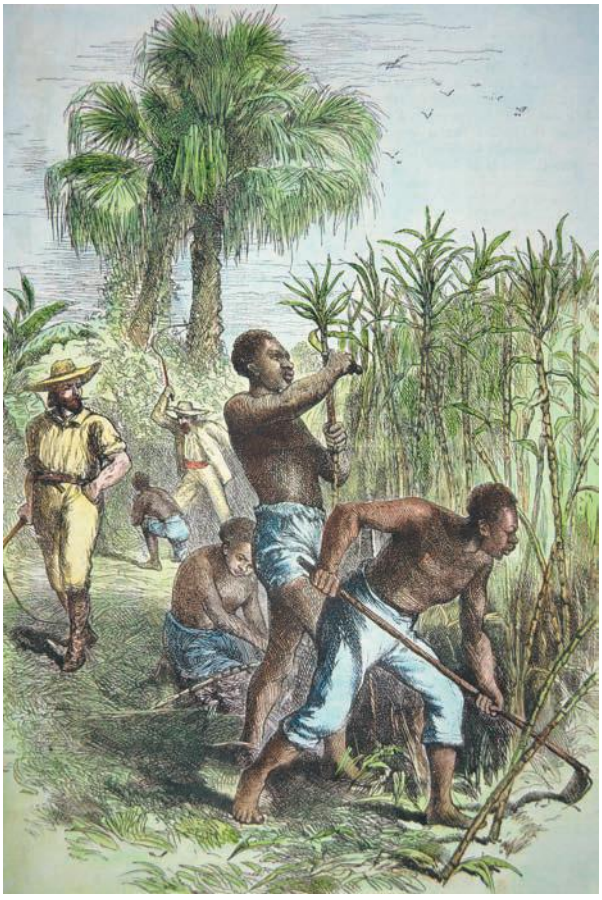
contained ancient groves of clove trees and where nutmeg was also grown. The Dutch East India Company took control of these islands in 1602 and held a monopoly on trade of these spices. In 1815, the first load of nutmeg arrived in Europe from Sumatra in Indonesia. At much the same time, the United States also entered the spice trade and American businessmen began dealing directly with spice growers in Asia. As the spice trade grew and spices became much more common commodities throughout the world, their value began to decline. In later years, the trade in tea and coffee surpassed the spice trade in economic value.

SUGAR

It is thought sugar cane was first cultivated in New Guinea in approximately 6000 BCE and a slightly different species was cultivated in India a little later. In approximately 700 CE, the Arabs learnt how to cultivate sugar cane after invading Persia. They then established sugar-cane production in North Africa and Spain following their invasion of these countries. The expansion of sugar cane continued into Europe as a result of the Crusades in the 11th century. When Columbus sailed to the Americas and the Caribbean, he took sugar-cane plants with him. This 'white gold' was a much sought-after food commodity and quickly spread throughout the globe as consumers began to enjoy its sweet flavour and versatility in food preparation.

Sugar beet was first identified as a source of sugar in 1774. It began to replace sugar cane as a source of sugar in England and Europe, as it was more suited to the cold climates of these areas.

Sugar cane was bought to Australia on ships with the First Fleet, but its cultivation was not immediately successful because the soil and climate in New South



Bridgeman Images/Peter Newark American Pictures

Late 19th-century depiction of slaves working in a sugar-cane plantation in the Americas

Wales were not suitable. Between 1863 and 1904, about 60 000 Pacific Islanders were transported to establish sugar plantations in Queensland, where the soil and climate were more suited to growing sugar cane.

Growth of trade in sugar

Sugar was a rare and costly commodity in Europe and the growth of sugar production soon spread from New Guinea and India, first to the Mediterranean and then to the Atlantic. By the middle of the 17th century, sugar was no longer considered a luxury item and was widely consumed in the United Kingdom and the United States. Sugar colonies were established in Barbados, Jamaica, Grenada and Trinidad in the 19th century. The trade in sugar became important to UK's development as a trading nation, and sugar from the colonies became their largest import. Trade in sugar spanned the Atlantic, touching the three continents, and the trade in sugar was a force in the development of industrialisation.

CHOCOLATE

Mesoamerica is the birthplace of chocolate – it is here the cacao tree is thought to have been cultivated in around 1900 BCE. It is believed that some 500 years later, Mesoamericans fermented the cacao beans and served the liquid as an alcoholic beverage. The Mayans and the Aztecs thought that the cacao had special powers. The Mayan people believed that cacao was the food of the Rain God Kon, while the Aztecs linked it to their God of Wisdom. For the Aztecs, the cacao bean was so important that they used it as a form of currency.

Cacao beans were brought to Europe in the 16th century. The Spanish sweetened the cacao with sugar and it quickly became a popular drink.

Activity 3.2

Analysing varieties of sugar

In 1977, English sugar company Billington's began importing Mauritian unrefined brown sugar. Sugar grown in Mauritius is sticky and molasses-rich. This sugar is only partially refined to produce different varieties of sugar with these qualities. Today, many of these varieties of sugar are available in Australia.

Worksheet

Aim: To investigate the sensory properties of varieties of Billington's sugar

Method

1. Select three or four varieties of Billington's sugar, such as dark muscovado, light muscovado, golden caster sugar, and demerara sugar – these sugars are available in major supermarkets.

Weblink

2. Place a small quantity of each sugar in small separate containers.
3. Undertake a sensory analysis of appearance, aroma, flavour and texture of each type of sugar variety and record your findings in a table similar to the one below.
4. Access the Billington's website and identify the characteristics of each sugar type. Select a suitable recipe for each one.



Billington's light muscovado sugar

Results

Record your results in a table like the one below.

SUGAR TYPE	DARK MUSCOVADO	LIGHT MUSCOVADO	GOLDEN CASTER SUGAR	DEMERARA SUGAR
Appearance				
Aroma				
Flavour				
Texture				
Use in a recipe				

Analysis

1. Which sugar has the darkest colour? What reasons can you suggest for this?
2. What impact might this sugar have on the flavour of a food product?
3. Which sugar has the largest crystals? How would this affect the process of cake making using the creaming method?
4. Which of the recipes you identified for using either light muscovado or golden caster sugar did you prefer? Justify your answer.

Conclusion

What advice would you give a consumer about their choice of a sugar variety when cooking?



Bridgeman Images/Bibliotheque Nationale

A 16th-century European engraving of Aztecs making chocolate

Activity 3.3

Cooking with chocolate

1. Work with a partner to prepare one quantity of chocolate fudge following the recipe provided.
2. Complete a sensory analysis of the appearance, aroma, flavour and texture of the fudge.
3. Write up your sensory analysis using technical terminology.
4. After tasting the product, rate it using facial hedonic descriptors.

Chocolate fudge

30 grams butter
½ can of sweetened condensed milk
250 grams choc bits
peppermint essence

Method

1. Line a 14 x 18-centimetre foil takeaway container tray with baking paper.
2. Melt the butter in a saucepan.
3. Add the condensed milk and chocolate and stir over constantly over low heat until smooth.
4. Add the essence to taste and mix well.
5. Pour into the prepared pan, spread evenly and refrigerate until set.
6. When set, remove from the tray and cut into small squares or shapes.

Growth of trade in chocolate

Christopher Columbus is said to have brought the first cacao beans back to Europe from his fourth visit to the 'New World' between 1502 and 1504. However, far more exciting treasures on board his sailing ships meant the humble cacao beans were ignored.

It was his fellow explorer, the Spanish Conquistador Hernán Cortés, who landed on the Mexican coast in 1517 and tasted the drink 'chocolat'. He brought the cacao beans and chocolate-drink making equipment back to Spain with him in 1528. Soon chocolate became a fashionable drink enjoyed by rich Spaniards. Drinking chocolate was Spain's secret for almost 100 years before other European countries caught on to the chocolate craze. Very gradually, the custom of drinking chocolate spread across Europe, reaching England in the 1650s.

Salt

For much of human history, salt has been a highly valued commodity and today it is used around the world in the cooking and seasoning of food; it is one of the five basic tastes.

Salt is an essential element in the diet of not only humans, but also of animals, and even of many plants. It is one of the most effective and most widely used of all food preservatives.

The ancient hunters of the Stone Age obtained their salt from eating animal meat. Animals instinctively seek out naturally occurring salt sources to satisfy their need for salt , for example, by eating salty vegetation and licking salty deposits on rocks. When the human diet changed to a more plant-based diet in approximately 10 000 BCE, people found that grains and vegetables tasted better when salt was added. Enjoying the taste, they then began to add salt to animal foods by salting meat and fish and making pickled vegetables.

By 6000 BCE, salt was being mined in China and became one of the necessities of peasant life. They used salt to pickle vegetables and eggs, and to produce soy sauce that has a a very salty flavour. For thousands of years, salt has been of major importance to the Chinese economy.

As early as 6050 BCE, salt was an important part of the world's history. Rome became established as the salt-trading centre and the Romans used salt to preserve fresh foods such as olives.

The early Greeks, Hebrews and Romans used salt during sacrifices and offerings in their temples and way to preserve of their food.

Growth of trade in salt

Salt was one of the first food commodities to be traded. In many countries, salt was used as a form of currency. Bars of salt were carried from the coast of Africa to inland cities of the Middle East where Arab merchants traded precious jewels and silk for salt. It was such a valuable commodity that in some places, its value was equal to that of gold.

Early trade in salt began when ancient Greeks traded salt for slaves and this led to the saying 'not worth his salt'. The word 'salary' is derived from the word 'salt'. Early Roman soldiers were paid salt instead of a monetary salary.

The Phoenicians, members of an ancient civilisation composed of independent states along the Mediterranean, including modern-day Syria, Lebanon and Israel, began trading in salt with the Egyptians. Later, they imported and traded large quantities of salt from the lake beds in North Africa and also traded salted fish for other goods across the Mediterranean.

As early as the 6th century, Rome's political leaders controlled the trade of salt by placing a tax on its sales. It was soon traded across the Roman Empire and to the United Kingdom, France, Spain and Turkey.

Understanding the text

11 Draw a diagram like the one below to compare the key features in the global spread of tea and coffee.



12 Draw a simple timeline to show the growth of trade in tea.

13 Describe the early uses of spices other than for culinary or cooking purposes.

14 Draw a knowledge map to demonstrate the key issues in the development of the spice trade.

15 Describe the role of the Arabs in the global spread of sugar.

16 Explain how cocoa spread from Mesoamerica to the rest of the world.

17 Outline the role of Hernán Cortés in the global trade in chocolate.

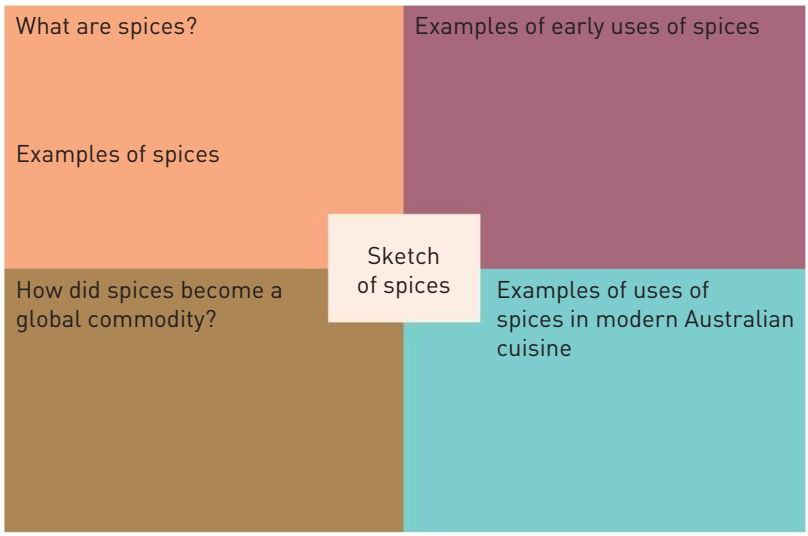
18 Explain why, historically, salt was one of the most important and valued commodities.

19 What are some of the ways the early Chinese and Romans used salt?

20 Why was salt considered to be such an important commodity in the ancient world? Explain the origin of the word 'salary' and its link to salt.

THINKING SKILLS

Prepare a summary frame on spices.



IMPORTANT TECHNOLOGICAL DEVELOPMENTS IN PRIMARY FOOD PRODUCTION



KEY FACTORS CONTRIBUTING TO GLOBALISATION

TRANSPORTATION OF PERISHABLE FOODS

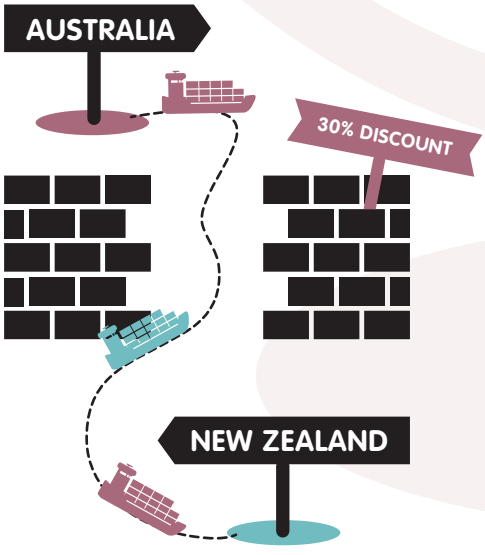
COLD-CHAIN TECHNOLOGIES



REFRIGERATION



REDUCTION IN TARIFFS AND OTHER BARRIERS TO TRADE



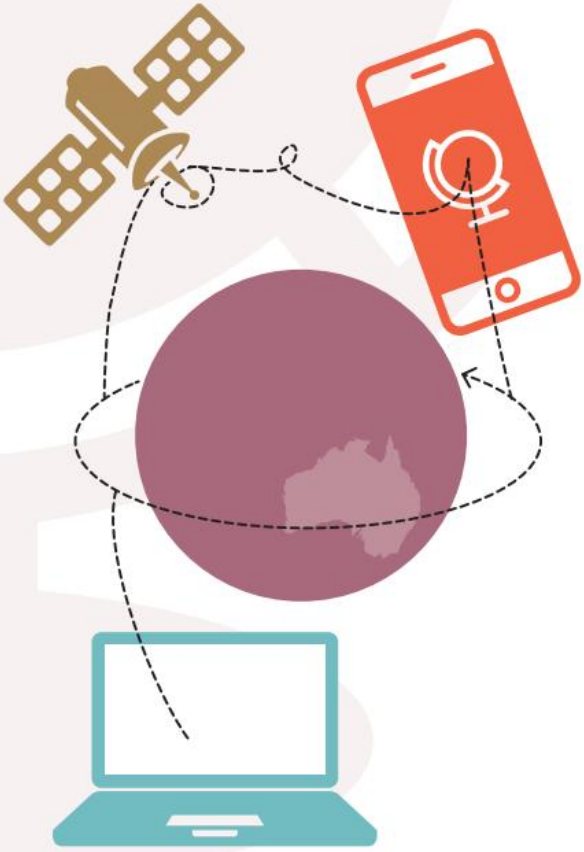
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INDUSTRIALISATION AND FOOD PRODUCTION

DEVELOPMENT OF MULTINATIONAL CORPORATIONS



IMPROVED COMMUNICATIONS



KEY TERMS

Fertilisers are chemical compounds applied to soil to promote plant growth.

Globalisation is the process by which the world has become interconnected as a result of increased trade and cultural exchange.

Green Revolution is a large increase in crop production in developing countries, achieved by the use of artificial fertilisers and high-yield crop varieties.

Industrialisation is the process by which a country or society is transformed from a primary agricultural society to one based on the manufacturing of good and services.

Irrigation is the artificial application of water to the land to enable agricultural crops to grow.

Multinational corporations are companies that operate and do business in more than one country.

Nitrogen fixing is the use of bacteria in certain plants to change nitrogen gas from the atmosphere into solid nitrogen that the plant can use.

Development of technology in primary food production

Throughout history, technological developments, or the application of scientific knowledge for practical purposes, have had a major impact on the industrialisation of the agricultural industry and on food production and processing. **Industrialisation** is the process by which a country or society is transformed from a primarily agricultural society to one based on the manufacturing of goods and services. A common consequence of industrialisation is that the manual labour done of individuals and individual food producers are replaced by mass production of goods using highly automated machinery and assembly-line processes.

As European nations built global empires, new food production systems helped to bring about a surge in new technologies, industrialisation and economic development.

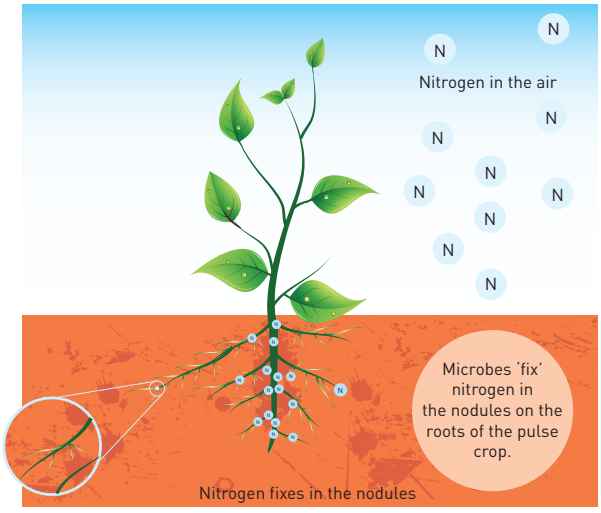
During the 20th century, the application of scientific and industrial methods for growing and processing agricultural products led to a dramatic expansion in the food supply, and consequently a surge in the world population. The invention of the plough, which occurred around 3000 BCE, the development of irrigation techniques and new seed varieties, and the use of agricultural chemicals have all influenced the development of agriculture.

The agricultural revolution began in the United Kingdom in the early 18th century and spread throughout Europe and North America by the 19th century. This period marked huge developments in agriculture, with new farming techniques and inventions in farm equipment and food-manufacturing processes leading to greater food production.

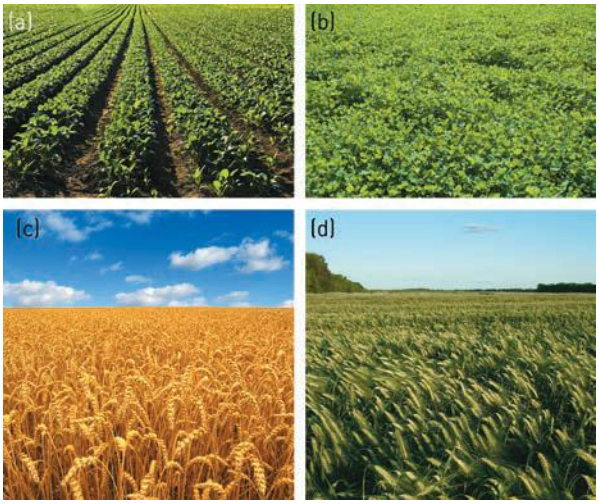
Agricultural chemicals and high-yield seed varieties

In the early civilisations, farmers overworked the land, depleting the fertility of the soil. By the 17th century, European farmers had learnt to regenerate the fertility of the soil through the use of animal manure and crop rotation, which led to increased crop yields. In the north and west of England, farmers used clover and turnips in rotation with wheat and barley to increase their cereal yields.

Nitrogen is a vital building block of all plant and animal tissue, in particular, the protein component of grains. In 1885, it was discovered that a process called nitrogen fixing also replenished and regenerated soil fertility. **Nitrogen fixing** is the use of nitrogen-fixing bacteria in certain plants to change nitrogen gas from the atmosphere into solid nitrogen usable by plants. Microbes that live in the soil invade the root hairs of legumes where they stimulate the growth of nodules that convert the free nitrogen in the air to ammonia. Nitrogen is necessary for plants as a nutrient, and legume crops such as peas, lentils, clover and beans contain nitrogen in nodules in their root system, making it available to plants. The planting of these crops in rotation regenerates the soil's quality after grain crops have been grown.



Pulse crop with root nodules for fixing nitrogen in the soil



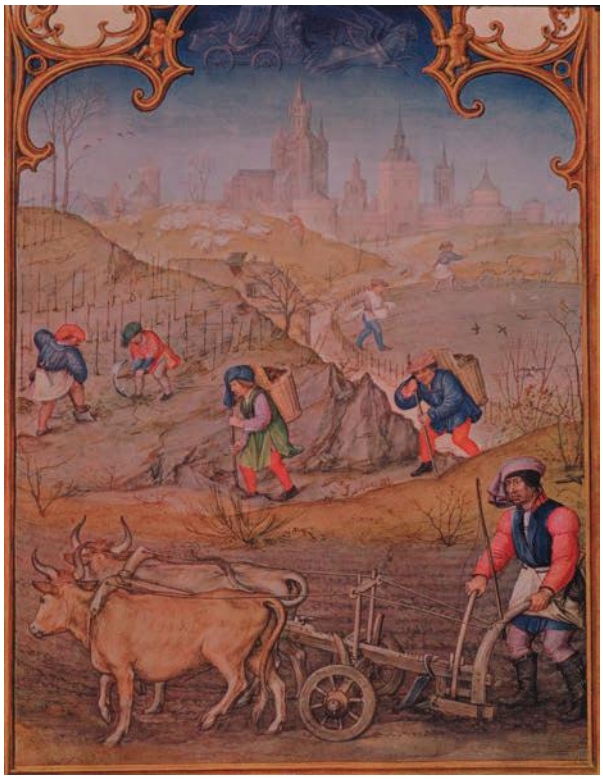
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Turnips (a) and clover (b) in rotation with wheat (c) and barley (d) is an example of a crop rotation system used to increase crop yield.

In 1909, a German laboratory made a major technological breakthrough when it developed ammonia. The manufacture of ammonia in factories established a much-needed fertiliser, which enabled farmers to dramatically improve food production, especially of crops. **Fertilisers** are chemical compounds applied to promote plant growth. The new artificial fertilisers, pesticides and high-yield seed varieties and an expansion of irrigation techniques led to what became known as the **Green Revolution** – a huge increase in crop production in developing countries in the 1960s. With this increase in crop production, the human population rose dramatically during the 20th century, from 1.6 billion to 6 billion. This Green Revolution transformed agriculture practices around the world and led, not only to the increased production of food, but to the spread of new technologies such as the application of pesticides and synthetic or artificial fertilisers, an expansion of irrigation techniques and improved crop varieties.

With fertiliser, it was now possible to grow crops from high-yield seed varieties, and new varieties of wheat and maize were developed to feed the growing population that otherwise could have faced malnutrition or starvation. The Green Revolution helped to lift hundreds of millions of people out of poverty and created a resurgence of the Asian economies, particularly in China and India. However, this process had some negative environmental impacts because many traditional farming practices were rejected: environmental damage such as soil acidification developed, and farmers became dependent on expensive seeds and chemicals.

The application of fertilisers produced cereal crops of wheat, corn (maize) and rice with larger and heavier heads of grain, which in turn meant higher yields. However, this also meant that the crops were more likely to topple over or 'lodge', so farmers had to strike a balance between using fertilisers that produced a high yield, and producing plant stalks that could support the grain heads. This balance required short or 'dwarf' varieties to be developed that put less energy into growing long stalks and diverted this energy into the seed head. This led to the development of high-yield varieties of wheat.



Bridgeman Images/Biblioteca Marciana, Venice, Italy

Early plough drawn by oxen

Invention of the plough

The mechanisation of farm processes allowed the replacement of human and animal labour with machinery, including machines to cultivate the soil, sow the seeds and harvest the crops. Mechanised farming allowed farmers to work larger areas of land with fewer farm workers.

The invention of the plough had a major impact on the food industry; through the use of ploughs, farmers became more efficient and could increase the quality and quantity of their crops.

The plough is a machine that contains blades that break up the soil. The plough allowed the soil to be cut and loosened in one operation and provided cuts within the soil for sowing seeds. For farmers, this meant less labour was required; it also meant that more land could be cropped more easily. Gradually, the design of the plough was improved by reinforcing it with iron, making it stronger and suitable for use on wetter, deeper soils.

Following the development of the plough, a range of other farming implements was invented to aid farmers in agricultural production, for example, the tractor and the header used for stripping grain. These new machines also increased production and meant fewer labourers were required to work on the land.

Machinery for sowing and harvesting crops

When crops were first domesticated, seed was sown by broadcasting; that is, they were simply thrown onto the ground by hand. The move to a more systematic, less random approach to planting occurred in Mesopotamia in 1500 BCE when farmers used a tube to drop seeds evenly into a channel. In 1701, Jethro Tull, an English agriculturist, invented the first seed drill, which made it much easier to drop the seeds in rows and channels. The seeds were then covered with soil, preventing the birds from eating the seeds, which happened when the seeds were simply broadcast randomly across the fields.



Getty Images/Time Life Pictures

Jethro Tull's seed drill

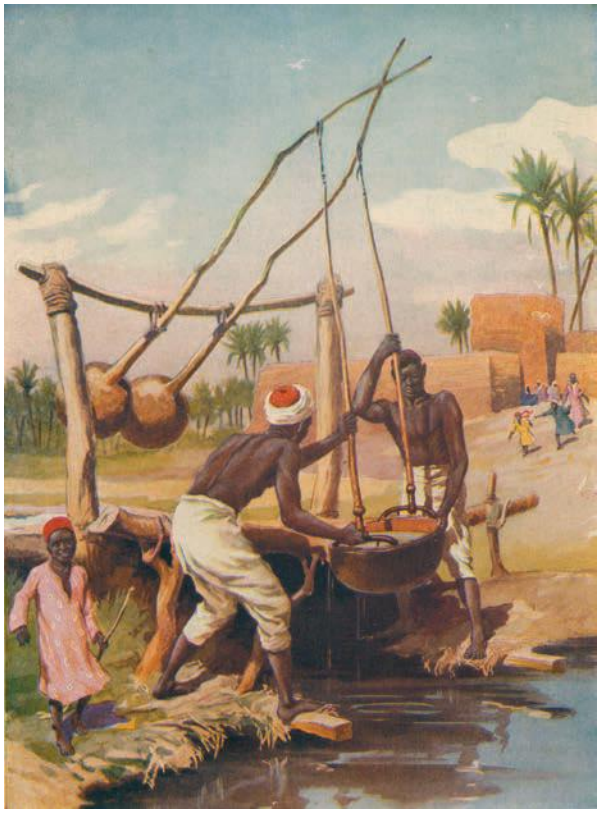
In 1834, an American inventor, Cyrus McCormick, developed a mechanical reaper, a machine for cutting and harvesting grain. This invention saved many hours of backbreaking labour in the fields during harvest time.

All these farming machine inventions made farming easier, requiring less time and labour, and made large-scale agricultural production possible.

Development of irrigation

Water is the most important input required for plant growth for agriculture production. **Irrigation** is the artificial application of water to the land to enable agricultural crops to grow. The first attempts to control water to grow crops took place in about 6000 BCE in Mesopotamia and Egypt, where canals were use to divert water from the rivers such as the Nile, Tigris and Euphrates to water crops.

Farmers in Mesopotamia and Egypt used a shadoof, an early irrigation tool, to draw water for crops. This tool consisted of a crossbeam on a frame that was fixed to the ground. A large pole was balanced on the crossbeam with a bucket or lifting device at one end and a counterweight at the other. The workers would use the shadoof to draw water from the river and then they could swing it around to water their crops.



Alamy Stock Photo/Chronicle

A shadoof, an early irrigation tool for drawing water

Later, in Persia, a tunnel or *qanat* was used to bring water from an underground source in the hills, down to the foothills. This meant farmers no longer needed to lift water from the river as they had previously done. This system was replaced later with canal systems called aqueducts, built using brick, stone or concrete.



Alamy Stock Photo/Lena Kuhnt

An early aqueduct for conveying water

As technology advanced, storage dams were constructed with blocks mortared together to prevent leakage. Spillways and floodgates were built to release water to a series of canals to allow flood watering of paddocks.

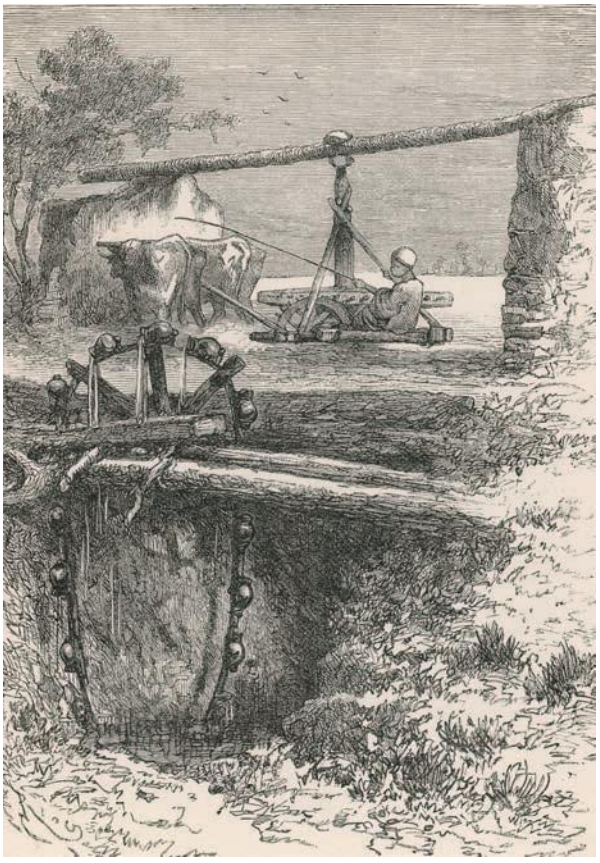


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A system of canals for irrigation

In 3000–2000 BCE a *sakia*, or Persian waterwheel, began to be used. The *sakia* is a waterwheel device that uses a series of buckets to scoop up water and then divert it to crops by very small channels. The *sakia* wheels were initially driven by animals and later by simple engines.

As technology developed, so did the sophisticated irrigation systems that we know today. These systems can supply an entire paddock with a uniform quantity of water using automated sprinklers and dripper systems that supply water just to the root system of individual plants.



Mary Evans Picture Library

A *sakia* waterwheel



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A modern spray irrigation system

DEVELOPMENT OF TECHNOLOGY IN FOOD PROCESSING

Developments in technology have meant that food can be processed and distributed to meet consumer demands and the demands of the market place. A greater quantity of food is now available to feed an increasing world population.

The grain industry

In 6000 BCE it was discovered that wheat seeds could be crushed between simple stones to make flour. This earliest method used a saddle stone or quern, and an upper movable stone known as a hand stone. The technology of early milling was based on the principle of a fixed bed stone and a rotating runner that ground the grain into flour.

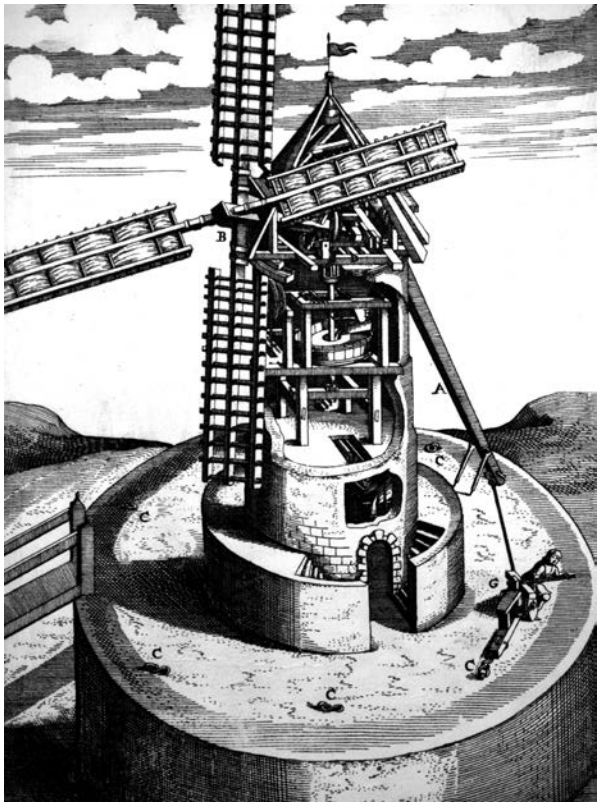


Getty Images/Science & Society Picture Library

Saddle stone and hand stone for grinding grains

By approximately 70 BCE, a water-powered grain mill had been developed in Asia, which was also used throughout the Roman Empire. These mills used steel rollers or gristmills that turned the millstones using a gearwheel driven by water or wind. By 1086, water-powered flour mills were in use throughout England and much of Europe.

In Hungary in the early 1870s, a new process of milling was developed using a series of rollers. The grain was passed between sets of spinning rollers to break down the grain. This process was followed by a series of rollers and sieves that removed the bran layer and wheatgerm, leaving behind the endosperm, or fine white refined flour.



Alamy Stock Photo/Timewatch Images

Early windmill for milling flour

Today, flour milling is an important industry and through the constant growth in technology, it has become a sophisticated process using computerised machinery and systems.



Shutterstock.com/Pavel Chagochkin

Modern computerised systems for milling grain

Understanding the text

1 Outline the consequences of industrialisation on society.
2 List four factors that have been influential in the development of agriculture across the globe.
3 What is meant by the term 'Green Revolution'?
4 Explain the impact of the Green Revolution on world food supplies and the world population.
5 Explain the role of nitrogen-fixing bacteria and the importance of planting legume and bean crops in rotation with cereal crops.
6 Why was the invention of the plough a breakthrough for farmers?
7 Describe early methods of sowing grain and how the invention of the seed drill improved this process.
8 Draw a simple diagram to show the development of irrigation systems.
9 Describe an early method of milling wheat grains and compare this to later methods.
10 Explain how the new milling process using rollers and sieves was able to create white flour.

The dairy industry

The dairy industry began in Mesopotamia about 6000–7000 BCE when cattle were domesticated and their milk, used for drinking and cheese making.

Traditionally, cows were hand-milked and the milk was placed in barrels and brought to the market by wagon to be sold. Dairy herds were small because hand-milking was a very time-consuming process.



Image Folk/Tom Kershaw

Hand milking a cow

As dairy herds grew in size, milking machines were developed. The early milking device consisted of cups that were attached to each of the cow's teats. This device sat on the top of a milking bucket on the floor under the cow. After milking, the bucket was emptied into a holding tank.

In the 19th century, a milk pipeline system was introduced. The milk pipeline was a milking device that allowed the milk to be transferred by pipe and gravity to a storage tank. This pipeline system greatly reduced the physical labour of milking and allowed more cows to be milked in less time, increasing the quantity of milk that could be produced. Later innovations included the use of herringbone and parallel bails in which a row of cows could be milked at once.



Alamy Stock Photo/Mark Thomas

Herringbone dairy

Later, a rotary system was developed whereby cows were loaded onto a platform one at a time. Once the cow was on the platform, the platform rotated. By the time the platform had completed a full rotation, a machine removed the cups from the cows, and the cows stepped off the platform and walked to the feeding lot.



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Rotary dairy

In the 1980s and 1990s, robotic milking systems were introduced into the dairy industry. In this automated system, the cow enters a bail where she is fed and her collar scanned to record that she has been milked. These advances in technology have led to the development of large dairy farms that house hundreds of cows and can produce large volumes of milk. As a consequence, these farms are rapidly replacing small family-run dairy farms.

Preserving milk

Storing milk at a cool temperature has been the main method of preserving the freshness of milk. Before the advent of electricity and refrigeration, water from underground wells was used to cool milk until it could be transported to the town market. This naturally occurring cold water was pumped into a cooling tub and the vat of milk was placed in the cold water. When refrigeration arrived in the early 19th century, cans, which were filled by hand-milking, could be stored in a refrigerated chamber. Later, vats were used to store bulk milk on the farm before the refrigerated tanker arrived to collect the milk.

Milk is a highly perishable food that is easily spoiled; it also contains disease-causing bacteria. In the 19th century, Louis Pasteur invented pasteurisation, a process that kills bacteria in liquid foods, particularly milk. This process involves heating milk to 72 °C and then rapidly cooling it, a process known as high-temperature, short-time processing. This process kills the disease-causing microbes, but does not change the sensory properties of the milk. Pasteurisation has had a major impact on the dairy industry and is now widely used throughout the world.

The development of milk-processing technologies includes new packaging techniques such as UHT or ultra-heat-treatment, an aseptic packaging technique. This process sterilises the package and the milk separately and then brings them together in a sterile environment. This process extends the shelf life of the milk and the package does not require refrigeration until it has been opened.

There have also been significant advances in membrane technology used for processing milk. This process commonly uses two forms – ultrafiltration and reverse osmosis – and involves the use of a porous membrane or filter to separate the particles in milk. Membrane technology has allowed the dairy industry and milk processers to produce nutrient-modified dairy products such as reduced-fat milks, low-fat cheeses and yoghurt, and products with increased levels of protein, vitamin D and calcium.



Aseptically packaged milk



Nutrient-modified milk

Cheese making

According to ancient records, cheese making dates back more than 4000 years. Legend has it that an Arabian merchant, travelling in the desert, accidentally created the first cheese by putting milk into a pouch made from the stomach of a sheep. When he stopped a few hours later for a drink, curds and whey had formed. The rennet, an enzyme found in the lining of the stomach, assisted the digestion of milk by breaking down the casein in the milk and causing it to curdle. This process is used in cheese making as it allows the curds to form and to separate from the whey by curdling the milk. The curds are then pressed to form cheese.

As cheese making spread around the world, new processing and manufacturing methods improved the process. Mass production of rennet began in the 1800s, and later, microbial cultures began to be produced. These processes made it possible to make cheese more widely available and in larger quantities. Factory-made cheese overtook traditional cheese-making methods during World War II.



Alamy Stock Photo/World History Archive

Early methods of making cheese by hand

The development of science and technology has brought efficiency and standardisation to cheese making, enabling the production of many different types of cheese.

Modern factories now use an automated production system with a computer system to manage the many complex processes involved in cheese making.



Shutterstock.com/Roman Babakin

Inside a modern cheese factory

Activity 4.1

Making your own cottage cheese

Aim: To compare and contrast the similarities and differences between homemade and commercial cottage cheese

Method

Worksheet

1. Work with a partner to prepare one quantity of homemade cottage cheese.
2. Before adding flavourings to the cheese, undertake a sensory analysis of the appearance, aroma, flavour and texture, and rate the cottage cheese by drawing a facial hedonic descriptor.
3. Write up your sensory analysis using technical terminology.
4. Complete a similar sensory evaluation of a commercial cottage cheese.

Results

	HOMEMADE COTTAGE CHEESE	COMMERCIAL COTTAGE CHEESE
Appearance		
Aroma		
Flavour		
Texture		
Facial hedonic descriptor		

1. Describe the similarities and differences in the homemade and commercial cottage cheese.
2. Which did you prefer? Justify your answer.

Homemade cottage cheese

½ cup full cream milk
2 teaspoons boiled water, cooled
1 junket tablet

Method

1. Crush and dissolve the junket tablet in the boiled water.
2. In a saucepan, carefully heat milk to 38 °C (body temperature). Be careful not to allow the milk to boil.
3. Pour the warmed milk onto the dissolved junket tablet.
4. Allow to stand for 20 minutes in a warm place.
5. Slice the curd into cubes and wait five minutes until the whey begins to appear.
6. Place a large sieve over a bowl and line sieve with a large square of muslin cloth. Make sure the cloth overhangs the sieve.
7. Tip the curd into the lined sieve and allow the whey to drain into the bowl below.
8. Cover the sieve loosely with plastic wrap and place in the refrigerator overnight.
9. Remove the curd from the cloth and place in a clean bowl. Discard the whey.
10. Cut the curd up with the tip of a knife.
11. Serving suggestion: Stir flavouring ingredients through the curd; for example, chopped herbs such as chives, coriander or mint, salt and pepper or honey and chopped fruit.


Draining the whey from the curd

IMPACT OF GLOBALISATION ON FOOD AVAILABILITY

The global demand for food has had a major impact on food systems and the diversity and availability of food.

Globalisation is a process by which the world has become interconnected as a result of increased trade and cultural exchange, leading to greater economic and financial cooperation between countries. Globalisation refers not only to the actual movement of trade, but also to the ability to move food commodities, investment, finance and labour across national borders.

The quest for spices was one of the earliest drivers of globalisation. Long before the voyages of the European explorers, spices were traded between countries and carried overland on trade routes. During the Middle Ages, spices created these global economic networks and many years later other food commodities followed a similar path. Although the term 'globalisation' came into common use in the 1980s, the concept stretches back centuries when Spain, Portugal, the United Kingdom and the Netherlands began trading spices and other foods. During these times, most countries were self-sufficient and relied on locally grown food, and there was limited trade between regions.

After World War II, there was a strengthening of international ties and trade markets and the foundation was laid for today's economic global economy. Gradually, the economies of most countries became interconnected and helped form an interdependent global economy.

Today, globalisation of food production is obvious in the supermarket and involves more countries than ever before. Fruit from New Zealand, asparagus from Peru, tea from Sri Lanka or cheese from France are all available in the local food store. Food is no longer tied to the seasons and it is now possible to buy food anywhere in the world, at any time of the year.

The food supply chain is complex. For example, rice may be grown in Thailand, packaged in India and sold in a supermarket in the United Kingdom. As populations increase and people in countries such as Brazil and China are becoming wealthier, there is greater demand by these countries for more imported meat and dairy products.

Improvements in the technology of transporting perishable goods

One of the key factors contributing to the globalisation of food is the advancement that has been made in the transportation of perishable goods.

In the 1700s, UK fishers used natural ice to preserve their fish stockpiles in the ocean. In even more primitive times, caves packed with snow were used to keep food safe.

The development of refrigerated and container transport, bulk shipping and improved air transport have enabled the easy mass movement of goods throughout the world. During the latter half of the 19th century, a number of cooling devices were applied to food when it was shipped. The advances in refrigeration began to be used and, together with increases in sailing speeds, it became possible to export perishable foods such as citrus fruits, bananas, meat and seafood around the world. This meant many seasonable foods were available all year round. Further advances in technology, such as controlled atmosphere packaging and modified atmosphere packaging, were used in storage and transportation and allowed for the further export of perishable fruit. This process involved changing or modifying the gas inside the package, slowing down the respiration and decomposition of the product, and extending its shelf life.



Getty Images/Greg Elms

Southern Australian live crayfish for export to China

The development of cold-chain technologies, that is a temperature-controlled food supply chain, has had a major impact on the globalisation of food products. These processes have helped extend the shelf life of food products such as fruit, seafood and frozen foods. The cold-chain infrastructure allows food to be kept in cool stores at 2–8 °C as it waits for transportation. It is then kept at this temperature during shipping or air transport until it reaches its destination. The cold-chain system is analysed, measured, controlled, documented and validated to ensure the product arrives in its best condition.



Shutterstock.com/135pixels

Vacuum-packed chilled meat ready for export

This temperature-sensitive system allows food products that are sensitive to changes in temperature to be transported to distant markets. During shipping, insulated shipping containers are used as well as specialised packaging.



iStock.com/Evren Kalinbacak

Loaded container ship

Improved communications

The development of communication technologies, such as the Internet, email and smartphones, has been vital for the growth of globalisation, as communication is now quick and efficient. The development of satellite TV channels, such as Sky and CNN, have also provided worldwide marketing avenues. Through the use of this modern technology, trade deals can flow freely and instantly throughout the world.

Development of multinational corporations

The agricultural and food-processing industry employs a significant proportion of the global workforce, but only a small number of companies control the industry. **Multinational corporations** are large companies that operate in more than one country, with headquarters in one country. These corporations are very influential as they control much of the world's food supply.

The **Coca-Cola Company** is a US multinational beverage corporation, producing soft drinks and a range of other beverages such as sports drinks and flavoured teas. It is a global leader in the beverage industry and sells its products in more than 200 countries. The company has a long history of acquiring brands; in 2005, it purchased the Australian companies SPC Ardmona and Goulburn Valley. Today, Coca-Cola Australia, together with Coca-Cola Amatil, sells 240 products in Australia.



Products owned by Coca-Cola Amatil

Kellogg's owns a large number of well-known cereal brands. It is the world's leading cereal company and the second-largest manufacturer of biscuits. The company owns a large number of brands of cereals, snack foods and frozen foods.



Kellogg's-branded cereals

Nestlé is one of the world's largest companies, with as many as 333 000 employees. The company produces products in almost every food and beverage category, from baby foods, drinks, cereals, coffee, chocolate, confectionary, ice-cream and pet care.



Brands owned by Nestlé

The rapid growth of other multinationals, such as McDonald's, has allowed these companies to sell their goods and services on a massive scale throughout the world. McDonald's has establishments in dozens of countries, and its menus vary depending on the culture. In Israel, for example, McDonald's serves a kebab on flatbread rather than the hamburgers seen in the United States of America. Its products are often customised to meet the religious or cultural requirements of a country, such as the Chicken Maharaja Mac, or the Veg Maharaja Mac, instead of beef in India.

Many consumers worry that large multinational corporations create a monoculture because they remove local competition and often force local businesses to close.



Getty Images/Kaveh Kazemi

Many multinational companies such as McDonald's have outlets across the world.

Understanding the text

11 Draw a simple flow chart to demonstrate the technological developments in the Australian dairy industry.

12 What is pasteurisation and why was it an important discovery for the dairy industry?

13 Describe the benefits to the consumer of UHT milk and modified milks produced by membrane technology.

14 What is rennet and why is it important in cheese making?

15 What is meant by the term 'globalisation'? Give examples to support your answer.

16 Outline the way in which developments in technology have led to an increase in the exportation and importation of perishable foods.

17 Explain the role of cold-chain technologies in the transport of perishable foods.

18 How have new communication technologies assisted the globalisation of food products?

19 Describe the impact that companies such as Coca-Cola, Kellogg's and Nestlé have on global food supplies.

20 Why has it been necessary for multinational corporations setting up fast-food outlets around the world to adjust their product types and ingredients?

THINKING SKILLS

WS Worksheet

Search online for digital images to demonstrate the development of technology in agricultural food production, for example, the use of the plough.

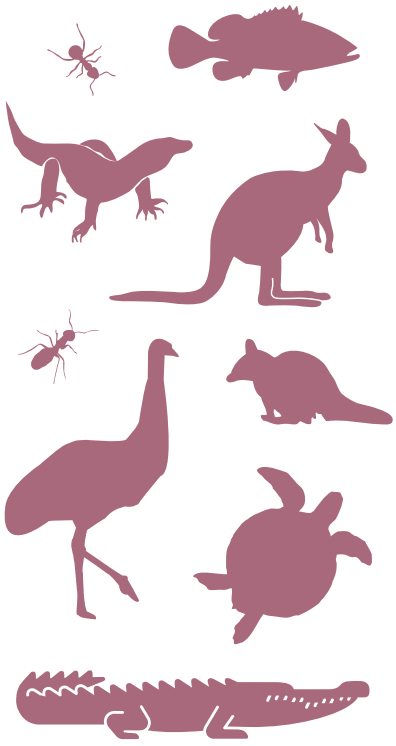
ORIGINAL EQUIPMENT	CURRENT EQUIPMENT	IMPACT OF DESIGN CHANGES ON FOOD PRODUCTION

FOODS EATEN BY INDIGENOUS AUSTRALIANS AND FIRST NON-INDIGENOUS SETTLERS

FOODS EATEN BY INDIGENOUS AUSTRALIANS

ANIMAL FOODS

- Fish
- Goannas
- Kangaroos
- Possums
- Witchetty grubs
- Emus
- Ants
- Crocodiles
- Turtles



PLANT FOODS

- Yams
- Bush tomatoes
- Quandong fruits
- Kakadu or green plums
- Macadamia nuts



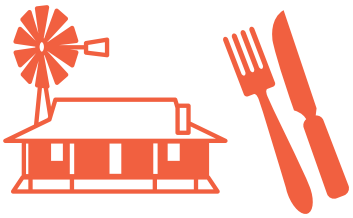
FLAVOURINGS

- Gum from bark of eucalyptus trees
- Nectar from flowers of native trees
- Honey
- Wattle seed
- Mountain pepper
- Lemon myrtle



5

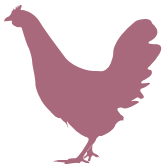
INDIGENOUS AUSTRALIAN FOOD

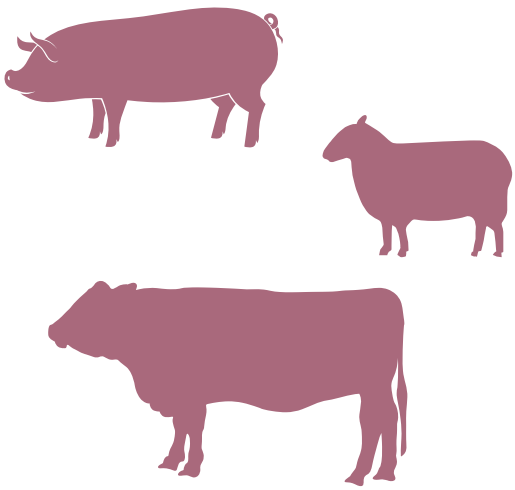


FOODS EATEN BY EARLY NON-INDIGENOUS SETTLERS

ANIMAL FOODS

- Pigs
- Chickens
- Sheep
- Cows





PLANT FOODS

- Wheat
- Corn
- Vegetables
- Rice



KEY TERMS

Firestick farming is regularly burning vegetation to facilitate hunting and to change the plant and animal species in an area.

Indigenous Australians are Australians of Aboriginal or Torres Strait Islander descent.

Indigenous foods are foods that are native to Australia; they include animals, birds, fish, seafood, reptiles, insects, fruits, flowers, vegetables, mushrooms and herbs and spices.

Indigenous Australians

Australia's Indigenous peoples, the first Australians, are thought to be the oldest surviving culture in the world and have lived on this continent for at least 40 000 years. Before 1788, the only people to inhabit Australia were the Indigenous peoples. They inhabited the whole of Australia and the Torres Strait Islands – the islands between Australia and Papua New Guinea. There were many different communities who spoke different languages and who had different cultural beliefs and practices.

LIFESTYLE OF INDIGENOUS AUSTRALIANS

Indigenous Australians were originally considered to be hunter-gatherers; that is, people who obtained their food from naturally occurring wild plants and animals. The hunter-gather lifestyle is also referred to as a foraging lifestyle, or one in which people have little control over their source of food. They were at the mercy of nature, not only in times of plenty, but also in times of flood and drought.



State Library of Victoria (H92.101/101), with thanks to the Elders of the Wurundjeri Tribe Land & Compensation Cultural Heritage Council Incorporated.

Aboriginal housing was a simple shelter made from bent-over stringy bark.

However, more recently historians and archaeologists have recognised that Indigenous Australians were in fact involved in the development of extensive agricultural practices and also very effective aquaculture systems. Bill Gammage, in his book titled, *The Biggest Estate on Earth: How Aborigines Made Australia*, argues that Indigenous Australians developed well-organised farming and land management practices across the entire continent. He also states that the Indigenous Australians 'burnt, tilled, planted, transplanted, watered, irrigated,

Case study

Wurundjeri people of Victoria

The Wurundjeri people of the Kulin Nation are the traditional owners of the land in the Birraryung Valley or what today is known as the Yarra Valley. The traditional lands of the Kulin nation included all of the area now encompassed by the City of Melbourne and the City of Yarra and extended south-east to Mordialloc and north into central Victoria. The Wurundjeri people spoke the Woiwurrung language as well as other languages of their nation.

For thousands of years before Melbourne was settled, the Wurundjeri people lived off the land. They had a special relationship with the land and rather than owning it, they felt they belonged to the land as their ancestors had done. The Wurundjeri people had specific boundaries in which they could set up camp and hunt and gather food. When they had depleted the supply of food in one area they moved on to the next site to allow the plants to regenerate during the following season.

As the clan members had been born and raised in the area, the members of the Wurundjeri clan knew the land well. They understood the seasons and when food would be plentiful. In winter, they camped on the higher areas around the river in case the river flooded. During spring and summer, they travelled long distances, often up to 16 kilometres each day to hunt animals and wildfowl or to catch fish or eels in the rivers and streams. The Wurundjeri also knew the best times and locations to gather fruit, dig for roots or yams or to collect birds' eggs.

As Melbourne became settled, the traditional lands of the Wurundjeri people were sold and cleared to make way for new buildings and roads. The people were not only dispossessed of their land, but they also lost their traditional sacred sites and their culture was upturned. Diseases introduced by the settlers and frequent clashes that occurred between the Indigenous peoples and the European colonisers also had a devastating effect on the population of the Wurundjeri people.

Today the Wurundjeri people are very active in the community and have built a strong, vibrant community organisation. They perform ceremonies such as the 'Welcome to Country' ceremony and pass on their knowledge to younger generations as a means of preserving their cultural heritage.

Source: adapted from aboriginalhistoryofyarra.com.au



State Library of Victoria (H154731), with thanks to the Elders of the Wurundjeri Tribe Land & Compensation Cultural Heritage Council Incorporated.

Detail of a painting showing members of the Wurundjeri clan on the banks of Merri Creek, which led to the Birrarung River (today's Yarra River)

weeded, thinned, cropped, stored and traded'. Therefore, rather than simply relying on hunting and gathering as the means of obtaining food, Gammage says that for Aboriginal Australians, 'the gathering is really the end point of a very sophisticated farming process.'

FOODS AND FLAVOURINGS OF INDIGENOUS AUSTRALIANS

The diet of Indigenous Australians was varied and rich in nutrients, and it very much depended on where they lived. For those who lived near the sea or a river, the diet was rich in fish, mussels and yabbies. In desert areas lizards or goannas provided protein. In more temperate areas kangaroos, witchetty grubs, possums and emus and other birds and eggs supplied Aboriginal peoples with a good source of protein. Across the country Indigenous Australians supplemented their diet with roots, yams, nuts, seeds, native greens, vegetables, nectars and bush fruits. However, the quality and quantity of food eaten varied from day to day, depending on the climate, water supply and the area they were moving through.

Indigenous foods are foods that are native to Australia and include animals, birds, fish, seafood, reptiles, insects, fruits, flowers, vegetables, mushrooms and herbs and spices. Today, these foods are commonly referred to as 'bush tucker'. The foods eaten by Indigenous Australians are generally classified as being from animal or plant sources.



Alamy Stock Photo/Bill Bachman

Digging for witchetty grubs

Foods from animal sources

Indigenous Australians relied on a varied group of animal foods for protein, including fish, mussels, yabbies, lizards, goannas, kangaroos, witchetty grubs, possums and emus and other birds and eggs.

Kangaroos have a cultural, social and spiritual significance for Indigenous Australians. Hunting, killing, preparing, cooking and feasting on kangaroo was an important part of their customs and beliefs. When a larger animal was hunted and killed it was shared among the group and sometimes with neighbouring groups. During these times, when a lot of meat was available, people ate large quantities at one time and these 'feasts' provided excess energy, which was be stored as fatty tissue for periods of food shortage.

The prime time for hunting or collecting mammals was when the animals were fat. Although some insects such as witchetty grubs and green ants had a relatively high fat content, most land animals were very lean. The small fatty deposits found in some parts of the animals were shared between many people. Every part of the animal was eaten or used to make things such as clothing, baskets, tools and weapons.



iStock.com/PELEANOR

Brush-tail possum



Alamy Stock Photo/imageBROKER

Bush turkey



iStock.com/KristianBell

Brown snake



Getty Images/Ted Mead

Witchetty grub



Dreamstime/Ausgirlnikki

Freshwater yabby

Foods from plant sources

A number of plant foods were considered staple foods, including yams, bush tomatoes, figs and quandong fruits. These plant foods provided an important supplement to animal foods rather than being eaten as an alternative to them. Bush vegetables, seeds and fruits are very rich in vitamins and minerals, and the green plum or Kakadu plum has the highest concentration of vitamin C of any known plant. Seeds of the acacia species are high in the essential oil omega-6, and wattleseed is now recognised as being a rich source of protein, with a low glycaemic index.



Auscape/Frank Woerle

Kakadu or green plums

Macadamia nuts

Before European settlement, macadamia nuts grew on the wet slopes of the rainforests in eastern Australia. Indigenous peoples feasted on these native nuts, which were considered a delicacy.

The nuts have a high oil content and so they added an important energy source to the diet of Indigenous people. The nuts were collected in dilly bags and then eaten raw or roasted in hot coals. Breastfeeding mothers ate the bitter nuts that had begun to germinate as they believed the nuts stimulated breast milk production.



iStock.com/sommail

Macadamia nuts

Flavourings

The traditional diet of Indigenous Australians was low in sugar, but some foods, such as honey ants, were a good source of this food; they were considered delicacies and were highly sought-after.

The honey ant was harvested by digging open the nest and dragging the ants out with a stick. The lucky people who found them did not swallow them, but placed them on their tongue, bit into the abdomen and sucked the honey out.

Other sweet foods included the gum from the bark of gum trees and nectar from the flowers of native trees. Honey was another prized discovery and was gathered from the sugar bag hive found in hollow trees by the women and children. It was carried in a coolamon, a multipurpose shallow bowl for collecting seeds, or a basket.



Photo: Dr Natasha Fijn

Yolngu community collecting sugar bag honey from a hollow tree

Wattleseed

Wattleseeds are edible seeds produced by a large number of species of the Australian acacia tree. The seeds and pods of wattles were a popular indigenous food source. The dried seeds of the wattle were collected and ground into flour and mixed with water to make a damper or bush bread. This bush bread was then cooked in the coals of the fire – it produced a loaf with a rich, toasted, nutty and coffee-like flavour. The young pods of the wattle tree were often eaten raw as a snack, or roasted or steamed.

Mountain pepper

The native pepperberry plant, or mountain pepper plant, is found in the cool high country in southern New South Wales, Victoria and Tasmania. The leaves and berries of this plant feature in traditional indigenous cooking as a flavouring ingredient. The berries turn a deep red-black colour when ripe and have a spicy, peppery flavour.



Alamy Stock Photo/blickwinkel

Mountain pepperberries

Lemon myrtle

Lemon myrtle is a flowering plant that is grown on the coastal rainforests in northern New South Wales and Queensland. The plant is naturally high in citral, which has a citrus lemony flavour, without high levels of acidity. Indigenous peoples extracted the oil from the leaves of the lemon myrtle and used it as a sweetener for foods. It was also used as a valuable herb for enhancing the flavour of foods. When ground ovens were used for cooking foods, such as fish in paper bark, leaves of the lemon myrtle were added to enhance the flavour of the foods. Sometimes, the leaves were infused in boiling water to make a refreshing, flavoursome drink.



Getty Images/Tatiana Gerus

Lemon myrtle flowers and leaves

Activity 5.1

Taste-testing bush spices

Aim: To experience the sensory properties of bush spices

Method

1. Work in pairs to complete this activity. Each pair should prepare one quantity of the recipe for bush pizza, following the recipe provided.
2. Taste-test the bush pizza. Focus on the properties of appearance, aroma, flavour and texture of the pizza. Record your results in a table like the one below.

BUSH PIZZA	
Appearance	
Aroma	
Flavour	
Texture	

Analysis

Describe the sensory properties of the pizza using technical terminology.

Conclusion

Did you enjoy the sensory properties of the bush pizza? Do you think it added an interesting alternative to the traditional Italian spices? Justify your decision.

Bush pizza

2 pita bread rounds, approximately 18 centimetres in diameter
⅓ cup of tomato passata
1 tablespoon bush chutney
1 teaspoon of bush spice or ¼ teaspoon of ground mountain pepper
½ cup grated mozzarella cheese

Method

1. Preheat oven to 200 °C.
2. Line a tray with baking paper and place the 2 pita bread rounds on the tray.
3. Stir the bush chutney through the tomato passata and spread half the mixture onto each bread round.
4. Sprinkle with bush spices or mountain pepper and sprinkle half of the cheese on top of each pizza.
5. Bake the pizzas for 15 minutes until the cheese has melted and they are a golden brown.
6. Slice each pizza into four and serve.

Understanding the text

1 Describe some of the practices that indigenous Australians used to obtain their food.

2 Explain why the Wurundjeri people found the Birraryung Valley and its tributaries (now Melbourne and its surrounding areas) an ideal place to live.

3 Draw a knowledge map to demonstrate some of the key foods eaten by Indigenous peoples.

4 Describe the value of the kangaroo in Indigenous societies.

5 List two animal foods in each category of the table that provided a valuable protein source in the diet of Indigenous Australians.

FISH	MAMMALS	BIRDS	ANTS AND GRUBS	REPTILES

6 Explain the valuable nutritional properties of the Kakadu plum and the seeds of the acacia (wattle) species.

7 List some of the plant foods that were considered 'staple' foods in the diets of Indigenous Australians.

8 Why were raw macadamia nuts considered an important food for breastfeeding mothers?

9 How did Indigenous peoples obtain sweet flavourings in their diet?

10 Describe how lemon myrtle was used to flavour foods.

HUMAN AND NATURAL RESOURCES USED BY INDIGENOUS AUSTRALIANS

Human resources

In traditional Indigenous societies, women played a central role within the family and were seen as equal to men. Each day, the women spent many hours gathering food for their group. They formed groups with their children, hunting small animals, fishing and collecting plants, seeds, fruit, berries, vegetables, honey, eggs and grubs. Women were also responsible for all of the domestic activities such as cooking. They were viewed as life-givers and the caretakers of life, and were responsible for child rearing and the socialisation of children.

Men spent most of their time hunting and fishing.



Getty Images/Lonely Planet Images/Lynn Gail

Indigenous Australian woman caring for children

They hunted large animals such as kangaroos and emus, and other birds, mammals and reptiles, usually alone or in pairs. They also had an important role as teachers of the young boys in the group, imparting knowledge about traditions and skills, and how a man should act when he grew up. Their other main roles were as fire keepers and warriors, protecting the group.



AGEfotostock/Corbis

Indigenous Australian man spearing fish

Natural resources

Indigenous Australians used wood from certain trees and shrubs to make a wide range of tools and utensils. Spear throwers and shields were made from the dense wood of blackwood wattles. Digging sticks were made from a hard wood and were used by women and children to collect roots and yams and to dig for ants.

Fire drills were used to make fire. They were also made from wood and consisted of a straight stick, which was rubbed rapidly between the hands against a tinder of grass or dried leaves. This friction created heat, which ignited the grass into a flame.



Alamy Stock Photo/Thierry Grun

Using a fire drill

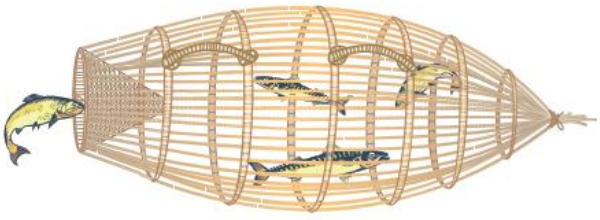
Indigenous Australians who lived along the waterways or near the coast built canoes for fishing. These canoes were relatively fragile as they were often made from the bark of gum trees. Canoes were used to transport fishermen through the lagoons and reed beds, where they would fish, catch eels or hunt for the eggs from waterbirds.

Nets, bags and baskets were woven from plant materials and used for carrying, collecting and



Getty Images/Claire Takacs

Lomandra, a plant used for weaving baskets



Fish such as barramundi were often caught in woven fish traps.



Getty Images/Lonely Planet Images/Lynn Gail

Baskets for gathering fruits and seeds

preparing food. Bulrushes, leaves, the stems of plants and the bark from trees were used to make string, baskets, bags and mats.

Nets were used for fishing traps, and for catching kangaroos and emus. Bags and baskets were used for collecting food and some bags were so closely woven that they could carry honey and liquids.

TOOLS AND TECHNOLOGY USED BY INDIGENOUS AUSTRALIANS

A great variety of tools, weapons and utensils were used to gather plants for food, fibres and medicine as well as to hunt animals for food and clothing. While all Indigenous Australians used a similar range of tools and equipment, the geographic location of various groups was reflected in the materials they used. For example, coastal groups applied fish bones to the tips of their weapons; desert groups used stone tips.



Tools and equipment used by Indigenous Australians

Spears and spear throwers

Indigenous Australian men used spears for hunting and fishing as well as for fighting other groups. They generally used a light wood that would fly easily through the air. The spears varied in size depending on their use – long spears for hunting large animals and short, stumpy spears for hunting animals, such as seals, at close range. Some spears were made from a single piece of wood while others had a stone head attached to the shaft, bound with yucca grass or the sinews of kangaroos. Indigenous Australians who lived near waterways used multipronged spears for fishing.



Getty Images/National Geographic/Ira Block

Spears were used for hunting.

The design of spear throwers or woomeras enabled the men to greatly increase the distance they could throw their spears. This technology enabled the woomera to act like a lever and an extension of a man's arm, projecting the spears with greater force than the thrower's arm movement alone.



Alamy Stock Photo/Independent Picture Service

Indigenous man using a woomera

Boomerangs

The boomerang is a tool that is synonymous with Indigenous Australians. It was widely used throughout the country for hunting and killing small animals or disabling larger animals. Large, heavy boomerangs were used in desert areas to hunt kangaroo while Indigenous men from costal New South Wales made smaller, lighter boomerangs to use when hunting ducks and other birdlife.



Auscape/Mike Gillam

Boomerangs were used for hunting.

Tools used for preparing food

Indigenous Australian women spent many hours grinding, pounding, straining, grating, boiling and cooking plant foods.

The first step carried out was the 'yandying', a tossing process used to separate the seeds from the stalks of plants, and other impurities such as small stones. The seeds were placed in a coolamon and were shaken and tossed, allowing the wind to blow away unwanted material or rubbish.

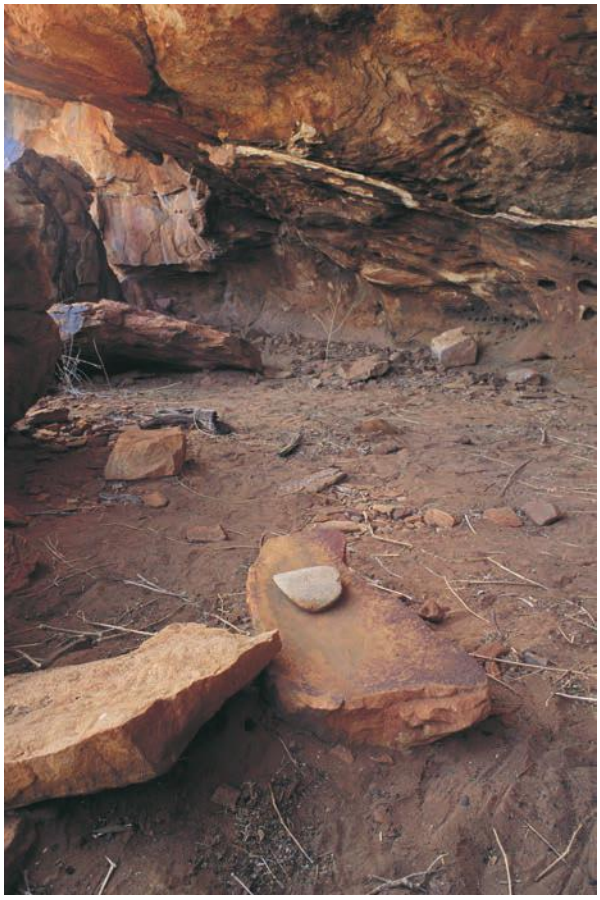


iStock.com/ Arkadiusz Rainczuk

Coolamons were used for collecting and carrying seeds.

Seeds and grains were often ground by sprinkling a little water on a flat stone slab and grinding them using a small flat stone.

To remove poisons and bitter flavours from some vegetables, after they were ground into a paste, they were put in a dilly bag, a bag woven from grasses, and washed by hanging the bag in running water in a stream.



Australian Geographic/Richard Thwaites

Stones were used for grinding the seeds of native grasses.

Bundles of grasses were often used to cover a depression in the sand and this was used to strain excess water from vegetables and plants. Graters were made from rough pieces of bark or tough grass leaves and used to grate vegetables. Water was boiled in bark troughs or large seashells in the preparation of many foods such as boiled birds' eggs.



Newspix/Matthew Munro

A collection of Aboriginal tools, including a coolamon, stone axe, dilly bags, grinding stone, fire sticks, woomera and shield.

Stone technology

Indigenous Australians were some of the first people to use technology to grind edges on cutting tools and to grind seeds. They used stone tools for a number of purposes such as preparing and chopping food and preparing animal skins for clothing. To manufacture these tools and weapons, rocks such as obsidian and quartz were attached to wood using resin, a sticky substance from trees. Evidence shows that these rocks produced a sharp cutting edge that gave a cleaner, smoother cutting surface than that of steel.

According to the Australian Government Department of the Environment, 'long before Europeans came to Australia, Aboriginal communities were applying advanced knowledge of engineering, physics, water ecology and animal migration to catch large numbers of fish in traps'. In his book, *Dark Emu* (2014), Bill Pascoe includes examples of well-developed systems the Indigenous Australians used to produce and collect food. He describes the Brewarrina Aboriginal fish traps in north-west New South Wales that have been used and maintained for thousands of years – according to some estimates they are more than 40 000 years old. Pascoe also states that these fish traps supported significant communities of up to 5000 Indigenous Australians who lived in the Brewarrina area.



State Library of Victoria (H2091 8/50)

Fish traps made from rocks were among the well-developed systems used by Indigenous Australians to provide food for large communities.

Stonefish traps were used in the rivers where the waters rise and fall. Stones were placed in a circle, and when the water rose the fish were washed into the circle. When the water fell or receded, the fish were trapped inside the circle and were easy to collect by hand.

In Victoria, Aboriginal communities near the Lake Condah district of western Victoria established extensive eel-farming systems (Budj Bim eel traps) based on the development of irrigated ponds. These eel traps are estimated to be more than 6000 years old. In a 2014 report for the ABC Radio National program, *Bush Telegraph*, local Indigenous man Jimmy Onus said in stories his grandfather told, 'eels were smoked in the hollows of trees, stored for lean times or traded with other Indigenous clans in the district'.



Alamy Stock Photo/Andrew Holt

Resin from a gum tree

SPECIALIST KNOWLEDGE AND PRACTICES OF INDIGENOUS AUSTRALIANS

Most Indigenous communities were semi-nomadic, moving in a regular cycle over a defined territory. They followed seasonal food sources and returned to the same places, at the same time each year. This helped to protect the fragile environment because Indigenous communities did not overexploit the food of a particular area by hunting, fishing or harvesting too much food in one area. This meant that the food supply could replenish itself and there would be food when the communities returned the next season.

Indigenous peoples divided the land using geographic boundaries such as rivers, lakes and mountains. Elders passed down the knowledge about these boundaries to the younger people in their community.

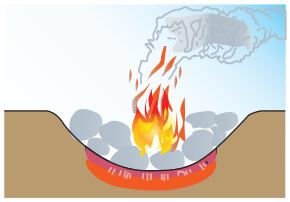
Indigenous cooking methods

Indigenous Australians hunted or gathered enough food for the day; very little was stored for future use. Many plant foods were eaten raw, and fruits, bulbs, nectar and gums were often eaten straight after picking.

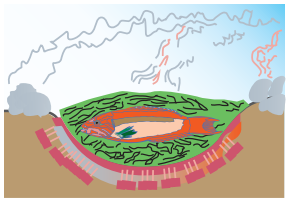
Food was prepared in many ways. Fire was used to cook meats and fish, and seeds and nuts were ground and roasted on the coals. Shellfish, vegetables and meats were also steamed and boiled. Some vegetables were cooked to make them more palatable.

Animal foods were generally roasted over an open fire or steamed in pits. Kangaroo was laid on a fire and seared for a short period so that the flesh inside remained almost raw. Another method was to use a bush oven in which the kangaroo or fish was placed in a large hole surrounded by hot rocks and sealed from the air. Sometimes the food was wrapped in melaleuca bark.

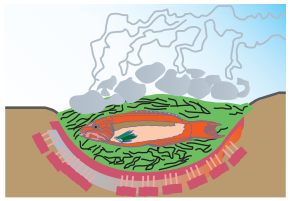
Seeds from trees, grasses and waterlilies were often made into a damper that was baked in hot sand and ashes.



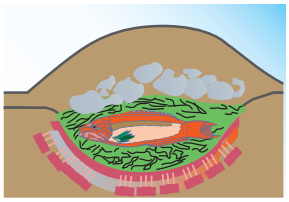
1 Fire is lit in a pit covered with rocks.



2 Rocks are removed from the pit and the fish or other food is wrapped in melaleuca bark or damp leaves and placed in the pit.



3 The hot rocks are placed back on top of the fish.



4 The fire pit is covered with soil to keep the heat and steam in.

Preparing a bush oven

Food distribution

Foods were proportioned and distributed according to traditional law and strict cultural practices determined by the elders of the group. Sharing food had a social purpose and was important as a way to strengthen relationships within the group or with neighbouring groups. Distribution was also associated with ceremonies or 'righting a wrong'. In some areas the older men received the choice cuts of meat and the remainder of an animal was distributed according to age and status.

Understanding the text

11 Describe the roles and responsibilities of women in an Indigenous society.

12 What is a fire drill and how is it used?

13 Explain some of the uses of nets and bags by Indigenous communities.

14 How did the woomera increase the distance a spear could be thrown?

15 Describe the processes used for removing the twigs and husks from seeds.

16 How were poisons and bitter flavours removed from some vegetables?

17 Explain how Indigenous women carried out the processes of grating and straining when preparing food in the bush.

18 How did Indigenous communities maintain the fragile nature of the food supply?

19 List the ways food could be prepared for cooking in a bush oven.

20 Explain how food was shared and why this was an important part of community life.

Management of the land and the environment

Indigenous Australians had their own way of managing the land and did not farm like traditional agricultural societies. They did, however, till the soil when they dug up yams, roots or tubers, but they were always careful to leave some roots to generate a new crop for the next season to provide an ongoing food supply.

A very important land management technique was carried out with the use of fire. Fires were always well controlled and were used to encourage the regrowth of plants. They were also used as a technique to burn off the tough covering of seeds and to make them ready for germination when the rains arrived. Indigenous Australians referred to this technique as **firestick farming**. In his book *To Feed a Nation: A History of Australian Food Science and Technology* (2005), Keith Farrer says 'They carried fire with them as fires sticks … they altered their food supply by firing forest and scrub deliberately and according to plan to promote the growth of lush green grass, thus increasing the supply of edible seeds and encouraging the grass-eating game on which they depended.' They also used fire to clear tracks for walking, to keep poisonous snakes away and to expose game by removing undergrowth and making them visible and easier to hunt. Fire-stick farming increased the amount and diversity of available food resources.

Indigenous Australians had great respect for their land because it supplied their food and supported their existence. People moved around within their tribal area and regulated the size of their population according to the land and its resources. When an area had insufficient food resources to support the group, they traded spears, baskets and possum skins for food. They possessed a detailed knowledge of the environment and, with careful planning, they could ensure the environment was protected and resources were not depleted, but could be regenerated and replenished, thus ensuring their diet was adequate and varied.

Finding water

Indigenous Australians used their knowledge of the environment to find water, an essential resource in an arid country. Their knowledge allowed them to harvest water from the roots of trees, such as the blue mallee tree, that stored water, and to drain the dew



Alamy Stock Photo/Penny Tweedie

Indigenous firestick farming

drops that collected on plants. They could also obtain water from a hollow tree by pushing some sort of pipes or straws into a hole and sipping out the water. Keith Farrer also describes the dam building projects in arid areas used by Indigenous Australians, stating that 'There is evidence that in some places dams were built to hold water after rain, and the diversion of flow in order to water fruit-bearing plants'.

When desperate, they could even squeeze the water from water-holding frogs. This frog species can store large amounts of water in its body and is found below the surface in clay pan wetlands.



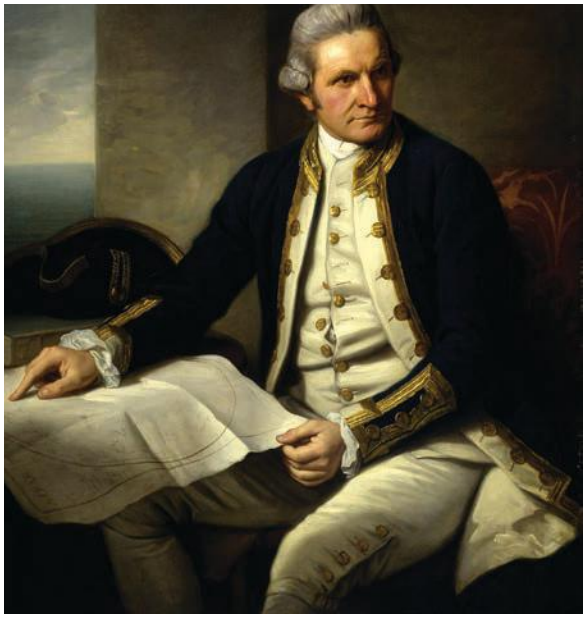
amanaimages/UIG/Auscape

A water-holding frog

Challenges for non-Indigenous settlers of establishing a sustainable food supply

In 1770, Englishman Lieutenant James Cook charted Australia's east coast in his ship the HMS *Endeavour*. He claimed the east coast of Australia on 22 August 1770, naming it 'New South Wales'. The charting of the Australian coastline in 1770 and the eventual arrival of the First Fleet in 1788 marked the beginning of the end of the traditional way of life for Indigenous Australians.

Captain Arthur Phillip and the First Fleet arrived at Botany Bay, New South Wales, in 11 ships with 1350 people in January 1788. Governor Phillip carried out his instructions from Britain to establish the first British colony in Australia. Food bought on the First Fleet consisted of flour, rice, salted meat, salt, alcohol, vinegar, seeds and vine cuttings. Livestock such as goats, pigs and chickens were brought as a source of fresh meat.



Alamy Stock Photo/GL Archive

Captain James Cook

The newly arrived passengers and crew of the First Fleet saw no evidence of settlement or cultivation of the land. They saw no fences or barriers, which were the traditional way Europeans marked land ownership, so the new arrivals concluded that no one owned the land.



State Library of NSW (ML 1222)

Captain Arthur Phillip raising the flag on the new colony in 1788

The people who arrived on the First Fleet were mainly convicts, marines and the wives of marines, most of whom had little farming experience. The greatest challenge for the new colonists was the availability of a consistent food supply.

Unlike the Indigenous Australians, the Europeans were unaware of the abundance of the nutritious food supply that surrounded them. They relied on supplies from England, but sea voyages from Europe were arduous and it took many months for fresh supplies to arrive.



National Library of Australia (nla.obj-135701870)

Early settlement at Parramatta

Lack of agricultural experience of the settlers

In the first weeks following the landing, Governor Phillip gave instructions to begin cultivation of the land so agricultural development similar to that practised in Britain and Europe began. The first task of the new settlers was to build a basic shelter and once this was done they could get on with the mammoth job of clearing the land by grubbing out the big trees and burning them, much as they had done in the 'old' country.

However, many of the early settlers were 'professional criminals', with few of the skills required for the establishment of a new colony. Few of the first wave of convicts and soldiers had farming, animal husbandry or trade experience. The long voyage also took its toll on their health and many new arrivals were too sick or unfit for work. In a short time, the hard labour and poor food supply in the settlement led to a deterioration in the health of many convicts.

Given the enormity of the task, officials in Britain soon realised that there was a desperate need for experienced farmers and labourers in the new colony. In 1793, the first free settlers arrived and among them were English farmers. These settlers were granted land to begin farming and under the conditions of their free passage they were granted additional assistance. The government provided two years' provisions as well as agricultural tools and implements. These new settlers were also allocated convicts who would work for them as labourers.

A different land and different climatic conditions

The early settlers faced many challenges and struggled to survive in the early years of the new colony. They had come from a developed country with buildings, roads and shops and were not used to the primitive and unfamiliar conditions that confronted them. They had little knowledge of Australia's seasonal patterns and their first attempts at farming failed. The climate in the new land was very different from the one they had left. England had lush pastures, well-watered and fertile soil suitable for growing all types of food and suitable for grazing for animals. A different land confronted the new settlers – one that was hot, dry and infertile, unsuitable for the farming methods and tools and equipment these new arrivals were familiar with.

Limited arable land near coastal areas

The attempts at agriculture by the settlers were fraught with problems, particularly as the soil around Sydney Cove where the first settlement was established was

very poor and often flooded. Governor Phillip soon realised that the coastal land around Farm Cove, close to where the First Fleet landed, would not support sufficient agriculture to feed the new colony. He established explorations to find more suitable land and found the arable plains fed by the Parramatta River, called Rose Hill. Efforts were soon concentrated on this area, and in 1789 a former convict, James Ruse, produced the first successful wheat harvest. As a reward, he was granted more land as well as pigs and chickens as there was an urgent need to produce food for the new colony. As settlers spread out from Sydney Cove, they found better land for farming and successfully began to grow crops and vegetables.

Suitability of crops and equipment brought on the First Fleet

Sheep, cows and other animals were sent from Britain on the First Fleet to be bred and raised in the new colony. However, it soon became obvious that the breed of sheep brought from England could not survive because these sheep were not suited to the harsh, dry conditions and different pastures available for grazing. Disastrously, some of the animals, such as rabbits, proved so well suited to the Australian conditions that they thrived and today are considered to be an environmental pest.

Many different kinds of crop seeds were also included in the cargo of the First Fleet with the intention that they be grown in Australian soil as a major source of food. However, a major problem that faced the new settlers was that the seed they had brought from England often did not grow as it had deteriorated on the long sea voyage or had been attacked by insects such as weevils. Much of the remaining seed also failed to germinate as the land around Sydney Cove was too sandy for farming and would not retain moisture.

The type of seed new settlers used was also a problem because these were English varieties of wheat that ripened in late July. These late ripening varieties were disappointing in the Australian climate and the grain became pinched by the hot winds of the Australian summers. In later years, scientists bred wheat varieties that were more suited to the local climatic conditions of heat and lower rainfall.

It soon became obvious that the farmers lacked suitable equipment for clearing the thickly wooded land. The hard Australian timbers soon blunted the English axes that were bought on the settlers' ships. Land clearing often involved sawing the trees off just above the surface of the ground and leaving the stumps that were later removed by convict labourers before the land could be cultivated.

Lack of a sustainable water supply

On arrival at Botany Bay, Captain Arthur Phillip decided that it was unsuitable for settlement as it lacked fresh water, so the colony was moved north to Port Jackson or Sydney Cove. The availability of a sustainable fresh water supply and management of droughts were major challenges for the early settlers. Settlers began to build dams to collect water when it rained, and they sank bores to tap into underground water supplies to provide water in periods of drought.

Unwillingness to adapt to the local environment

Though the Australian landscape had many food resources, such as fresh fish available in the rivers and oceans and a plentiful supply of kangaroo, the first settlers chose to grow the same types of foods and raise the same types of animals they were familiar with at home in Britain. However, often out of desperation, or because some of the settlers were a little more adventurous, they tried the local food such as wombat and kangaroo. However, they usually did not enjoy it as it was so different from the foods they had known.

Poor communication with the Indigenous community

After a voyage of three months, the First Fleet arrived in Botany Bay. Here the Indigenous Australians, who had lived in isolation for 40 000 years, encountered the British in an uneasy meeting. It was not long before conflict began, because the colonists did not understand Indigenous Australians' relationship with the land, and the local people did not understand farming and the concept of land ownership.

The local Indigenous people in the Parramatta area had an excellent knowledge of their environment, particularly the seasons and the flora and fauna. Their knowledge also included the significant spiritual sites that were not understood or treated with respect by the British.

Governor Phillip encouraged a hospitable relationship with the Indigenous inhabitants and trade of water, axes and artifacts took place. However, because they spoke different languages, they had little understanding of each other's cultures.

Understanding the text

21 Explain why the use of fire and firestick farming were important to Indigenous Australians in their management of the land.

22 Describe some of the ways Indigenous Australians found water to drink.

23 What were the first differences noticed in the new colony when the first settlers arrived?

24 Explain why the provision of a food supply proved to be a great challenge for the first non-Indigenous settlers in Australia.

25 Why did many of the first settlers have very few farming skills and experience?

26 How did Governor Phillip begin to encourage and develop agriculture in the new colony of Australia?

27 Describe the differences in climate between Britain and Australia that were immediately evident when the first settlers arrived.

28 Why were the seeds of wheat bought from Britain unsuitable for Australian conditions?

29 What strategies did the first settlers use to provide a water supply?

30 Explain why the different values held by Indigenous Australians and the first non-indigenous settlers often caused conflict.

THINKING SKILLS

Worksheet

Complete the sentence starters below.

I learnt that indigenous animal foods ...	
I notice that some of the indigenous plants that are used in contemporary cuisine ...	
I now know that Indigenous peoples used natural resources such as ... because ...	
Some interesting facts I learnt about tools used for hunting and gathering food are ...	
I learnt that when cooking and distributing food, Indigenous peoples ...	
Something I learnt about how Indigenous peoples care for the environment is ...	
I used to think ... about non-Indigenous settlers, but now I think ...	

KEY EVENTS IN THE DEVELOPMENT OF FOOD PRODUCTION IN AUSTRALIA

1791

Wheat is first cultivated.

1803

Sheep are successfully introduced.

1820

Roads are built, opening up grazing land in the Blue Mountains.

1830

Greek settlers introduce grape growing.

1838

Flour mills and breweries are established.

1842

Grapes are first grown in the Barossa Valley.

1860s

Sugar cane is planted near Brisbane.

1870s

Wheat and barley become important broadacre crops.

1880s

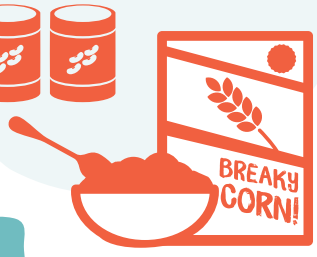
Food processing factories such as Rosella start production.

1900s

Dried food industry begins in South Australia.

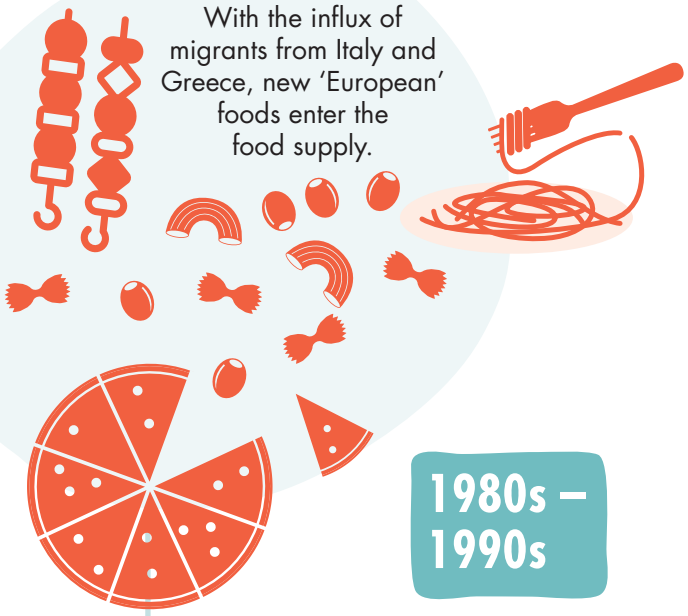
1920s

Food products are first marketed as convenience foods; food processors such as Heinz and Kraft enter the market.



6

DEVELOPMENT OF FOOD PRODUCTION IN AUSTRALIA



1947

With the influx of migrants from Italy and Greece, new 'European' foods enter the food supply.

1980s – 1990s

Large food companies, such as National Foods, enter the market.

1945

The Australian food industry becomes 'Americanised' with the introduction of frozen foods and hamburgers.



2000s

Many more meals began to be eaten away from home; *MasterChef* was aired for the first time; and alternative milks began to grow in popularity.

1950s – 1970s

Supermarkets carry a greater range of processed foods, such as canned and frozen foods.



KEY TERMS

Agriculture refers to the practice of cultivating land, growing crops and feeding, breeding and raising livestock.

Cattle feedlot is a managed facility for the purpose of producing beef of a consistent quality.

Food processing is the transformation of raw food or ingredients into new food products by physical or chemical means.

Horticulture is the cultivation and management of a garden or orchard.

Mixed farming is the grazing of sheep and cattle or raising of pigs, as well as broadacre farming of cereal grains.

Monopsony is a marketing board that consists of one body or organisation that controls the market by selling to many buyers.

Development of agricultural production in Australia

With the growth and development of agriculture, horticulture and food processing in Australia, people were able to provide a reliable source of food for their families.

Agriculture refers to the practice of cultivating land, growing crops and feeding, breeding and raising livestock, whereas **horticulture** is the cultivation and management of a garden or orchard.

Agriculture is a combination of the Latin words *agri* meaning field and *cultura* meaning cultivation, for example, wheat, oats and barley, sheep and cattle.

Horticulture is a combination of the Latin words *hortus* meaning garden and *cultura* meaning cultivation, for example, fruit and vegetable growing.

DEVELOPMENT OF THE WHEAT INDUSTRY

Wheat is a staple food and one of the most important commodities produced by the Australian agricultural industry. The first wheat crop was planted in 1790 on 40 acres of land called the 'Experiment Farm' at Parramatta in New South Wales. This land was more suited to cereal production than the land where previous attempts at crop growing had been made, and more successful crops were grown.

Agriculture in the early years of settlement was challenging because the only tools available to till the soil and plant the grain were hand ploughs and basic machines drawn by animals.



National Library of Australia (nla.obj-137238743)

Early machinery used to plough the land

Harvesting was done by hand using a reaper or a scythe, and cut sheaths of straw were laid in stooks or bundles. The bundles were then collected and taken for threshing and winnowing to remove the individual grains from the head of wheat and to blow away the excess chaff. This was a very time-consuming process and significant quantities of grain were often lost.

With the settlement of Victoria, South Australia and Western Australia during the 1830s and 1840s, the cultivation of wheat grew rapidly.

The development of technology aided the expansion of the wheat industry into large-scale operations. The process of harvesting wheat and other grains became much easier with the invention of the 'stripper' in 1843. This machine was much faster and effective as it combed the straw of the wheat and collected the grain heads rather than cutting the straw.

In 1876, the invention of the stump-jump plough made it easier to open up new land for grain growing in areas such as the Mallee country of South Australia and western Victoria. These areas had been cleared



Getty Images/Hulton Archive

Harvesting wheat with a scythe



State Library of NSW (PXB 310/59-119)

Stooks of wheat ready for threshing and winnowing

of trees for farming, but the strong tree roots and stumps that remained were difficult to remove. The stump-jump plough had the ability to spring back after coming into contact with tree roots in the soil and to continue ploughing.

In 1884, H.V. McKay invented the combine harvester, a machine that improved production as it could harvest, thresh and winnow the grain all in one process. A team of horses, usually heavy working horses such as Clydesdales, pulled the harvester.

In the 1880s, the inland country railway network was opened and this new infrastructure greatly improved the transportation of grain to flour mills and to ports for export. In the 1890s, superphosphate and nitrogen were introduced into agricultural production to improve naturally poor soils that were further depleted by overcropping and grazing.

In the late 1800s, William Farrer began research into new wheat varieties and developed wheat that was more suited to Australian growing conditions. In 1900, he developed strains of wheat that had a shorter growing period and matured earlier. The new strains of wheat ripened before the very hot weather of the Australian summer and could resist winter frosts. These varieties were also resistant to the fungal disease called 'rust' that lowered the quality of the yield. By 1901, Farrer had developed a wheat variety called 'Federation' in honour of the newly proclaimed Australian nation. This wheat was drought- and rust-resistant, produced high yields and was suitable for bread making.

In the 1920s, herbicides, insecticides, pesticides and non-organic fertilisers were developed to protect crops and increase yield.

In the 1920s and 1930s, farmers in Australia rebelled against the pricing of large grain-handling companies



Museum Victoria (IU 000085672)

The Sunshine combine harvester revolutionised the grain industry.



State Library of NSW (PXB 310/59-119)

One of the first tractors in Australia

and the Australian Wheat Board was established. This organisation was a market form known as a **monopsony**, a marketing board that consists of one body or organisation that controls the market by selling to many buyers. The Australian Wheat Board, together with the Canadian Wheat Board, controlled much of the world's grain trade in the 20th century. During this time, the Soviet Union and China had undertaken collectivisation, consolidating small farms into large state-controlled holdings. However, this system failed to produce sufficient grain to feed their populations and they became large importers of Australian grain.

By the 1940s, farmers began using tractors to pull harvesters, seeders and ploughs, which were more efficient than animals. This began a new age of motorised machinery.

In later years, growth of the Australian wheat industry was supported by changes in many farm management activities. Farmers embarked on **mixed farming**, that is, grazing sheep and cattle or raising pigs, as well as broadacre farming of cereal grains. They employed new techniques such as crop rotation and the application of fertilisers, and made improvements in cultivation techniques.

The improvement of bulk grain-handling systems, the development of chemicals to combat diseases, pests and weeds, and the further development of higher-yielding, disease-resistant wheat strains are some of the factors that continue to make important contributions to the industry.

Since the 1970s, other crops such as lupins, lentils, canola and field peas have been grown in rotation with wheat crops, or in rotation with pasture for cattle and sheep.

DEVELOPMENT OF THE AUSTRALIAN DAIRY INDUSTRY

The Australian dairy industry began with the arrival of seven dairy cows and two bulls on the First Fleet in 1788. These cattle had poor fodder and grazing conditions and within months had escaped into nearby bushland. The nine animals survived and six years later when they were recaptured their number had increased to 61. They became the basis of the first herd of Australian dairy cattle.

Australia's cheese- and butter-making industry began at this time and was based on the traditional cheese- and butter-making techniques the farmers brought with them from Europe. This allowed them to preserve these products so that there would be a supply available during autumn and winter when the dairy cows produced less milk.

The dairy industry grew quickly through breeding and the importation of new stock, and by 1800 the size of the breeding stock had increased significantly. In 1805, Dr John Harris built Sydney's first commercial dairy, and the first cheesemaking factory, the Van Diemen's Land Company, was established in Tasmania in the 1820s.

In 1832, the first Victorian dairy herd was established by John Fawkner with just two cows and two calves. Within 20 years, the ideal dairying conditions around Port Phillip Bay saw the number of dairy cattle in Victoria increase to more than 300 000.

In the early years, a lack of refrigeration meant that the dairy industries only supplied the domestic market and these dairies were located close to consumers. However, as refrigeration became more widespread, the industry became more commercialised. Cooperatives were established to transport, process and market the milk produced by farm dairies. Gradually, many of these cooperatives become corporatised and large independent companies, such as Bega Cheese, National Farmers and Dairy Farmers, were established.

DEVELOPMENT OF THE AUSTRALIAN MEAT INDUSTRY

Over the first 100 years of European settlement, sheep and cattle numbers increased rapidly as the demand for meat grew to feed the growing population. Crossbreeds were imported from various countries around the world in an effort to find breeds that were best suited the Australian environment. Droughts and dingoes were a constant threat, but by the 19th century stock numbers had increased to more than 100 million sheep and approximately 8 million cattle. Numbers continued to increase as farmers improved their pastures, fenced their farms and improved pest control.

In 1879, Australia sent a shipment of frozen beef to Britain and since then the meat export industry has continued to grow, making Australia a leading exporter of commercial livestock. Australia has an established reputation for its meat products and the strict quarantine regulations mean that the country is free from many sheep and cattle diseases experienced in Europe. Australia's natural environment provides vast grazing land and plenty of sunshine to raise healthy stock.

Cattle

Early development of the Australian beef-cattle industry was based on the shorthorn breed, as it was able to adapt to the hot, dry and rugged conditions of north-west Queensland, the Northern Territory and the Kimberley region of Western Australia. Cattle in these areas of Australia are run on large cattle stations and graze on native pastures.



Alamy Stock Photo/ryepixels.com

Shorthorn cattle

The Angus breed is grazed mainly in the south-eastern regions of the country, where there is lush pasture as a result of higher rainfall. Here the cattle are grazed more intensively on smaller farms and are fed on pasture and fodder crops.

In 1960s, the United States market was opened up to Australian grinding beef or mince steak, which caused the great expansion of the industry. This market grew further as hamburger and mince-steak recipes became popular in many homes and restaurants. Today, beef is the second-most popular fresh meat consumed after chicken.

While pasture-fed methods of cattle production are most commonly used, feedlots have increased since the mid-1980s. **Cattle feedlots** involve feeding cattle a high-protein diet for 60–300 days, according to the specific market requirements for the purpose of producing beef of a consistent quality. Feedlots produce beef that is of high quality and marbled with fat. This meat is exported mainly to Japan or used in local high-quality restaurants.



Shutterstock.com/Taras Vyshnya

Black Angus cow

Sheep

Sheep are produced across a wide range of climates from the arid and semi-arid parts of Australia, to the high-rainfall areas of New South Wales, Victoria, South Australia and Tasmania. Lamb production was initially for local consumption, but with the development of refrigeration in the 1880s, export to the United Kingdom expanded.

In the early 1900s, when the sheep industry was expanding, mutton, that is, fully grown sheep, were cheap and plentiful. In the 1920s, better pastures enabled farmers to fatten lambs, and they too became more widely available and affordable. The lamb roast became an icon of Australian cuisine at this time and took its place on Sunday lunch tables for many years.



Shutterstock.com/Lee Torrens

Sheep were raised for meat and wool.

Pigs

Pigs, like many other animals, came to Australia with the First Fleet. In the early years of settlement, many farmers in grain-growing areas who had a ready supply of grain for feed, raised a few pigs on their farm.

In the early 1960s, new farming systems and technologies were introduced and Australia's first large-scale intensive piggery was built. Today, 89 per cent of production comes from herds of 100 or more breeding sows and Australia produces 5 million pigs annually. Approximately 34 per cent of Australian pork production is processed into bacon, hams and smallgoods.The rest is sold as fresh pork meat.



Alamy Stock Photo/Arterra Picture Library

Intensive pig production

Chicken

Australia's chicken-meat industry is relatively new compared to other major livestock industries. Up until the 1950s, most of the chicken production in Australia was carried out in people's backyards or on larger family farms. During the 1960s, the consumption of chicken meat increased dramatically as a result of the introduction of continuous processing systems. These new systems meant that large quantities of poultry could be processed faster and more efficiently, leading to a reduction in the price consumers paid for chicken.

In 1968, Kentucky Fried Chicken opened its first store in Australia and by the 1970s it had opened 75 stores across the country. During this period, the consumption of chicken meat increased by 38 per cent as a result of genetic improvements in chicken breeding and further improvements in processing techniques. During the 1980s, production and consumption of chicken meat continued to grow as it was considered to be a relatively inexpensive type of meat.



Alamy Stock Photo/Ruby

Large-scale chicken production led to an increase in the consumption of chicken meat.

Understanding the text

1 Explain the difference between agriculture and horticulture.

2 Why was the development of the stump-jump plough such an important technological development when opening up new land for cultivation?

3 Draw a time line to demonstrate the key developments in Australian wheat production.

4 Why was the development of refrigeration so important for the dairy industry in Australia?

5 Explain two factors that contributed to an increase in the number of sheep and cattle in the early years of the agricultural industry.

6 Explain why different breeds of cattle are used in northern and south-eastern Australia.

7 What is meant by the term 'cattle feedlots'?

8 Outline two factors that led to an increase in the supply of Australian lamb meat.

9 Describe the way the production of pig meat has changed over the past century.

10 Explain how technology helped the market for chicken meat to increase so dramatically during the 1960s.

Development of horticulture in Australia

The growth of horticulture in Australia, particularly the establishment of orchards and vegetable production, was closely linked to the development of irrigation. Irrigation systems such as the Snowy Mountains Scheme were established to divert water into the Murray and Murrumbidgee rivers to make farming, and particularly fruit growing, viable in inland areas. The development of canning in Australia also had a major impact on the fruit industry and the export of fruit.

CITRUS FRUIT

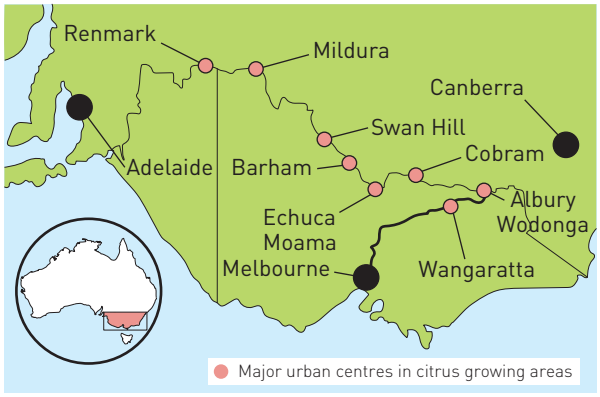
Australian citrus production began in 1788 when the First Fleet arrived carrying the seeds of limes, lemons and oranges, collected from Brazil en route to Australia. These seeds were planted and the trees now form the basis of today's national citrus industry.

The early settlers found Australia's climate ideal to produce a large range of quality citrus fruit. In 1887, the Chaffey brothers migrated to Mildura from California. They imported Washington Navel and Valencia orange trees from their homeland and developed a citrus industry in the Murray Valley, as well as establishing an irrigation settlement. Today,



iStock.com/Klaus Hollitzer

Valencia oranges are widely grown in the Murray Valley.



Citrus-growing areas in Australia

this citrus-producing region extends from the South Australian–Victorian border to Sunraysia and the area around Wangaratta.

Citrus fruit growers in these regions grow two types of oranges: navel oranges, which are available in the winter from June to October; and Valencia oranges, which are available in the summer months from November to February.

VEGETABLES

Vegetable production in the early years of settlement was difficult because soils around Sydney Harbour were poor and were not suitable for growing vegetables on a large scale.

In the 1850s, market gardens were developed by the Chinese to provide food for the diggings during the gold rush. From the 1860s until the 1890s, Chinese market gardeners supplied a variety of fresh vegetables and sometimes fruit to miners in the gold diggings across Australia.

Between 1900 and 1920, the majority of vegetables grown in Western Australia were grown by Chinese market gardeners. More than a third of the Chinese population of Western Australia was involved in the market-garden industry – an industry that was very labour intensive and relied on farming techniques practised in China.

Chinese market gardens were later established in the suburbs of Australian capital cities; in Melbourne

market gardens were established along the Merri Creek and in suburbs such as Caulfield and Brighton. Market gardens also featured in many country towns throughout the nation. The gardens operated on a cooperative basis, often with as many as 10 workers from the same family group. Chinese shopkeepers and greengrocers gave financial help to the gardeners and then sold the produce on the gardener's behalf. The gardeners worked long hours using handmade tools and grew a range of vegetables such as tomatoes, cauliflower, herbs, leafy green vegetables and lettuces. In 1901, 43 per cent of all market gardeners in Victoria were Chinese.

Many of the Italian and Greek migrants who arrived in Australia following World War II chose to work in market gardening as they had done in the rural regions of their home countries. However, many of them found it challenging as they needed to learn which crops suited the local conditions and it could take several years before a market garden succeeded. The market gardeners grew beans, peas, cabbages, cauliflowers, lettuce and early potatoes.

Case study

Alfred Fong Tong, market gardener in Warracknabeal, Victoria

The majority of the Chinese immigrants who became market gardeners like Alfred Fong Tong came to Australia seeking their fortune on the goldfields during the 1850s and 60s. Many turned to vegetable growing and made a reasonable and regular living selling vegetables to miners. After the gold rush declined, many drifted north to the Mallee and later to the Wimmera region in Victoria. Many of these Chinese people established market gardens with a great degree of success, and some even became farmers in various parts of Victoria. Because of immigration restrictions in force at the time, most of the Chinese market gardeners were not able to bring their families with them to Australia but sent what money they could home to their relatives.



Jenny Taylor, Warracknabeal & District Historical Society

Chinese market garden in Warracknabeal



Jenny Taylor, Warracknabeal & District Historical Society

Alfred Fong Tong; Chinese market gardener, Warracknabeal 1890–1940

Over a number of years several market gardens were established in Warracknabeal in the Wimmera in western Victoria, mainly along the Yarriambiack Creek. This creek provided a regular water supply for the gardens. Most of the vegetables grown by the market gardeners were boxed and taken to the Warracknabeal Railway Station where they were sent to Melbourne for sale. Some vegetables were sold locally to shops or directly to the local people.

Alfred Fong Tong and his family were market gardeners who grew a wide variety of vegetables in Warracknabeal for more than fifty years, from 1890–1940, the longest surviving market gardeners in the region.

Source: Jenny Taylor, Warracknabeal and District Historical Society Box 355, Warracknabeal, Victoria, 3393

Activity 6.1

Analysing orange juice and drink varieties

Aim: To investigate the properties of orange juice and drink varieties

Method

1. Select four varieties of orange juice or orange juice drink. Choose varieties that are obviously different in price.
2. Observe the labelling and packaging of each drink and record the packaging type, the country of origin and type of ingredients used.
3. Read the label carefully and record the nutritional information.
4. Calculate the cost of 100 mL of each drink.
5. Conduct a taste-test of each drink.

Results

1 Record your results in tables similar to the tables that follow.

WS Worksheet



Orange juices and drinks

LABELLING AND PACKAGING				
DRINK NAME	LIST OF INGREDIENTS	ORIGIN OF ORANGE INGREDIENTS	PLACE OF MANUFACTURE	PACKAGING TYPE
1				
2				
3				
4				

NUTRITIONAL INFORMATION PER 100 ML				
DRINK NAME	TOTAL CARBOHYDRATES	SUGARS	VITAMIN C	ENERGY IN KILOJOULES
1				
2				
3				
4				

COST PER 100 ML OF EACH DRINK		
DRINK TYPE	COST OF THE DRINK	COST OF 100 ML OF THE DRINK
1		
2		
3		
4		

2 Now observe the appearance, aroma, flavour and texture of the orange drinks. Record your observations in a table like the one below. Wash your mouth out with fresh water between tasting each drink. Provide a ranking for each category according to your preference, using a scale such as: 5 = Excellent, 4 = Very good, 3 = Good, 2 = Satisfactory, 1 = Poor.

TASTE-TESTING THE DRINKS					
DRINK TYPE	APPEARANCE (COLOUR)	AROMA	FLAVOUR	TEXTURE OF DRINK IN THE MOUTH	OVERALL SCORE
1					
2					
3					
4					

Analysis

1 List the drinks that use only Australian-made ingredients.

2 List the drinks that use orange concentrate. Why is it used?

3 Which drinks contain only freshly squeezed orange juice? Did the freshness of the juice have an impact on the flavour of the drink?

4 Why are some of the drinks fortified with additional nutrients?

5 What is the role of preservatives in fruit drinks?

6 Identify the drink that contained the highest amount of vitamin C. Why does the vitamin C content vary between the drinks?

7 Study the label. Is there a relationship between the sugar content and the number of kilojoules the drink contained per serve?

8 Which drink was the best value for money? Justify your answer.

Conclusion

What advice would you give consumers about their purchase of orange juice and drinks?

Development of food processing in Australia

Following the establishment of successful horticultural industries in Australia, it became important to develop a means of preserving the fresh fruit and vegetables for times when it was out of season or to export the produce to overseas markets. This led to the development of the Australian food-processing industry. **Food processing** uses physical or chemical means to transform raw food or ingredients into new food products.

CANNING

In 1815, canned produce was introduced into Australia from Britain and this canned food was used by the early explorers on their expeditions throughout the country.

The first Australian meat-canning works was opened in Sydney in 1846; it produced canned beef and mutton that was exported to Britain.

In 1861, a jam-making factory was opened in Hobart and locally grown berries were made into jam and then the jam was canned. The Tasmanian fruit industry dominated the commercial jam industry well into the 20th century.

In 1892, the Mildura Fruit Preserving Company opened and began canning apricots, peaches, nectarines and other fruit and vegetables sourced from growers around Mildura.

The demand for canned food increased dramatically during World War I as the military sought food that could be sent overseas for the troops. Throughout the war, troops survived on canned foods such as 'Bully Beef' – a canned corned beef that could be transported safely and did not deteriorate in the trenches.

In 1921, Ardmona established a cannery near Shepparton in the Goulburn Valley. The cannery sourced its fruit from the irrigated orchards established by the soldier settlers after World War I. In the 1930s, R.C. Edgell established a modern cannery to can asparagus and other vegetables he originally grew on his property in New South Wales.

In the 1940s, the canning industry became more mechanised and this meant that fruit such as cherries could be machine pitted, apples cored, peaches sliced and fruit juices could be canned.

By the mid-1940s, the pineapple industry was well established in Queensland. In 1947, Golden Circle began operations after a group of about 900 growers bought shares in a cooperative that financed the building of a new cannery. Golden Circle's first products were canned pineapple, paw paw, fruit salad and citrus cordials and other fruit juices. They also began to produce canned beetroot from the 1960s.



John Oxley Library, State Library of Queensland (256040)

Golden Circle pineapple canning in the early 1950s



Some of the first foods canned by Golden Circle were sliced pineapple and beetroot.

DEVELOPMENT OF THE MILK-PROCESSING INDUSTRY

The first steps in the development of an Australian milk-processing industry began in 1870 with the establishment of a system of milk delivery from farms to a central processing point for the manufacture of butter and cheese. At this time, butter making involved allowing time for the milk to stand so that the cream could rise to the top of the milk vat. This would then be skimmed off and the cream hand-churned and heavily salted to form butter.

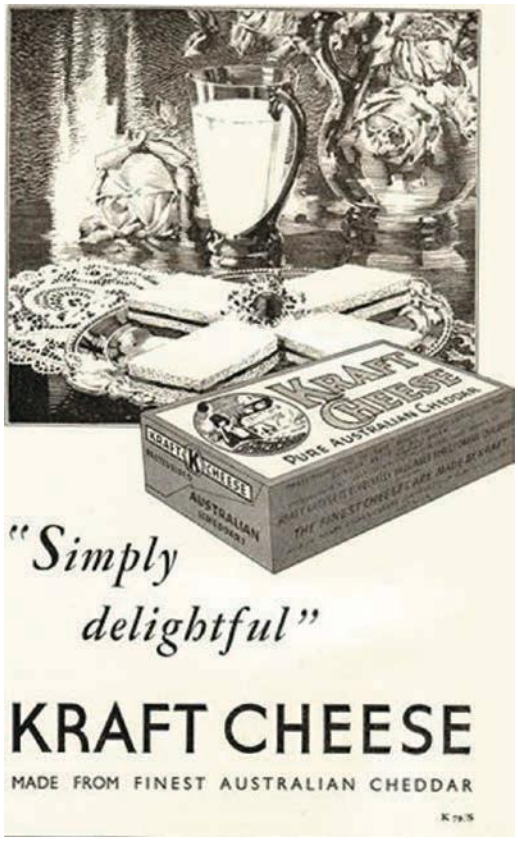


Image from the collection of Victorian Interpretive Projects Inc

Early packaged cheese

At much the same time, commercial cheesemaking began in Bodall, a small country town on the south coast of New South Wales. This area was desirable as it had rich river flats and an ideal climate to produce excellent pasture for dairy cows. The production of cheddar cheese for local consumption and export continued in this area until the 1950s.

In 1925, a Melbourne food processor obtained the rights from the American company Kraft to manufacture other processed cheeses in Australia.

Devondale Murray Goulburn

Devondale Murray Goulburn was established in 1950 by a group of dairy farmers who combined their efforts to seek better prices for their milk. The company operates under cooperative principles and is 100 per cent controlled by its dairy farmer suppliers. It is now Australia's largest dairy foods company, processing more than one-third of Australia's milk supply.

In 1951, Devondale Murray Goulburn opened its first cooperative factory in Cobram in New South Wales. The following year, it exported its first shipment of butter to the United Kingdom. By 1958, the production of cheese, butter and casein had reached 2500 tonnes and more than a million gallons of milk were produced for local and Melbourne markets.

Activity 6.2

The history of the Shepparton Preserving Company

Weblink

1 Undertake an Internet search of the history of the Shepparton Preserving Company.

2 Prepare a time line of the development of food processing by the company from its establishment in 1917 to the late 1990s.

Your time line should include information about the key dates in the development of the company and the types of food processing undertaken by the company.



Image used with permission of SPC

SPC factory in 1917

In 1956, electric cooling vats were installed on dairy farms in the Cobram area for the first time. This was a significant development in milk production as it meant that milk could be handled in bulk and the farmers could deliver their milk to the factory once a day rather than having to deliver it after the morning milking and again after the dairy cows had been milked at night.



Image courtesy Devondale Murray Goulburn

The first Devondale Murray Goulburn factory in Cobram, Victoria

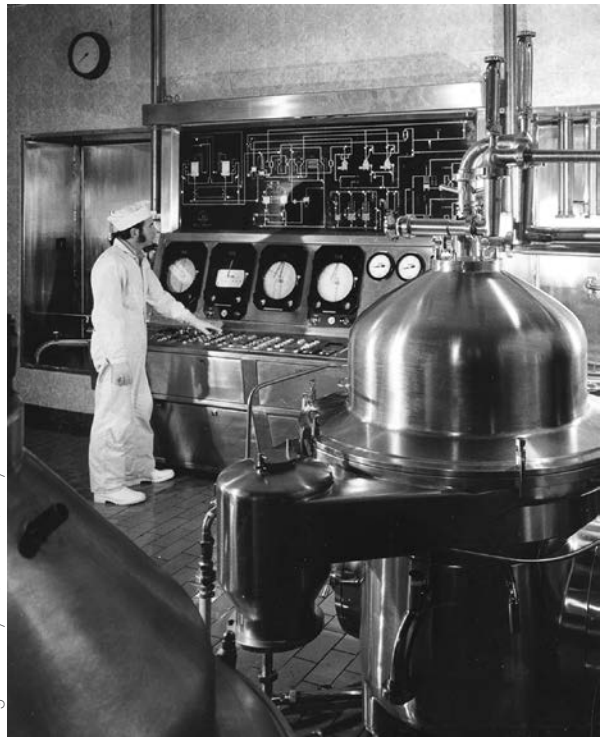


Image courtesy Devondale Murray Goulburn

Early milk processing at the Devondale Murray Goulburn factory

The company gained fame in 1968 when astronauts on the first space flight to the moon ate casein sticks produced in the Devondale Murray Goulburn factory at Cohuna. The 1970s saw a significant increase in the production of all dairy products, and butter was exported to Russia for the first time.

Considerable innovation took place in the dairy industry during the 1980s, and in 1985 the company began producing individually wrapped cheese slices in their Cobram plant. New blends of butter were also developed during the late 1980s and the company released Dairy Soft, a new blend of butter and oil, onto the market. By 1987, further developments in technology enabled the company to produce a new range of low-salt butter products to meet the demands of health-conscious consumers.

Understanding the text

11 Why did the Snowy Mountains Scheme have such a significant impact on the development of horticulture in Australia?

12 Describe the role of the Chaffey brothers in the development of the citrus industry in Victoria.

13 Name the two types of oranges grown in Australia and the seasons in which they are grown in the Murray Valley region.

14 Draw a knowledge map to explain the role of the Chinese market gardeners in the development of the vegetable industry in Australia.

15 Define the term 'food processing'.

16 Draw a time line to highlight the key stages in the development of food processing in Australia from 1815 to the 1940s.

17 Explain how the development of the Golden Circle cannery and canning of tropical fruits had an impact on menus throughout Australia.

18 Describe how butter was made in the 1800s.

19 Why was the area around Bodall in New South Wales so well suited to dairy farming?

20 Prepare a time line for the historic development of the Devondale Murray Goulburn cooperative company.

THINKING SKILLS

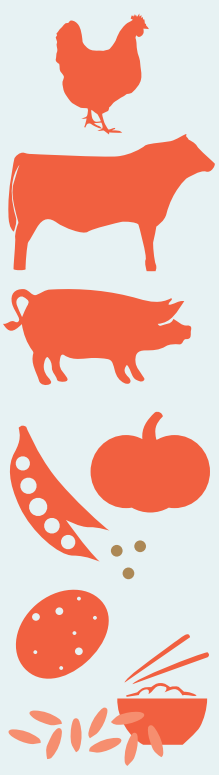
Prepare a snapshot summary of the development of one agricultural or horticultural industry in Australia. The snapshot summary should be written in your own words using vocabulary specific to the industry, and should be 60–100 words in length. It should include any important words related to that particular industry.

PATTERNS OF MIGRATION TO AUSTRALIA

1788

CONVICT TRANSPORTATION AND FREE SETTLERS





1800s

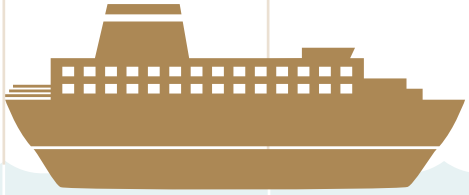
LABOURERS TO THE NEW COLONY

- Chicken chow mein
- Chop suey



1940s

EUROPEAN IMMIGRATION POST-WORLD WAR II



- Pasta
- Eggplant
- Zucchini
- Feta cheese
- Olives
- Olive oil
- Lemons



1950s

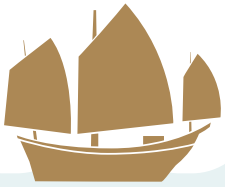
IMMIGRATION FOLLOWING THE 1956 MELBOURNE OLYMPIC GAMES





1970s

VIETNAMESE BOAT PEOPLE



- Fish sauce
- Shrimp paste
- Nuoc cham, a Vietnamese dipping sauce
- Rice vermicelli
- Cellophane noodles
- Traditional Vietnamese herbs and spices, including lemongrass, Vietnamese mint, Saigon cinnamon, bird's-eye chilli and kaffir lime leaves
- Fruit, such as mangosteen, jackfruit, durian and star apples





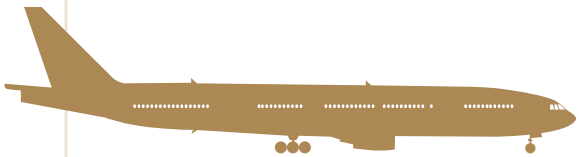


7

IMPACT OF MIGRATION ON AUSTRALIAN CUISINE

1980s >>

REFUGEE RESETTLEMENT





- Afghanistan
- Balkan States
- Democratic Republic of Congo
- East Timor
- Eritrea
- Ethiopia
- Iran
- Iraq
- Lebanon
- Myanmar
- Pakistan
- Somalia
- Sri Lanka
- Sudan
- Syria



KEY TERMS

Chalau is a simple dish of fluffy white rice that is a staple recipe in Afghanistan.

Filo pastry is a pastry made by layering many sheets of paper-thin dough with butter; it is commonly used in Greek cuisine.

Koulourakia are a Greek twisted butter biscuit traditionally served at Easter.

Loukomades are delicate, golden balls of deep-fried dough, drizzled with honey and cinnamon served as a dessert in Greece.

Nuoc cham is a Vietnamese dipping sauce.

Spanakopita are cheese and spinach triangles made with filo pastry; they are a popular Greek dish usually served as an appetiser or first course.

Tzatziki is a yoghurt, cucumber and garlic dip often used as an accompaniment to spicy Greek meat dishes.

Vietnamese herbs and spices include lemongrass, Vietnamese mint, Saigon cinnamon, bird's-eye chilli and kaffir lime leaves.

Vietnamese boat people refers to people who fled Vietnam by boat, seeking asylum in other countries.

Patterns of migration to Australia

Australia is a nation built on migration. The first inhabitants, Indigenous Australians, arrived on the continent more than 40 000 years ago from nearby islands in South-East Asia and New Guinea. For tens of thousands of years, Indigenous Australians ate the food that the land provided – its native plants and animals. Since that time, the cuisine we know in Australia today has been built on successive waves of migration.

CONVICT TRANSPORTATION AND FREE SETTLERS

With the arrival of the First Fleet in Botany Bay in 1788, the first convicts landed on Australian shores. More than 160 000 convicts, mainly from Britain and Ireland, were transported to Australia. Initially, their diet consisted of bread, salted meat and rum. During the late 1700s and early 1800s, thousands of free settlers arrived in Australia to start a new life. English, Scottish and Irish agricultural and domestic workers brought their traditional cooking methods and recipes with them, such as meat pies, Irish stew, Cornish pasties and shepherd's pie. However, many people chose to eat fresh kangaroo, wallaby meat and native fowl or bush turkey, as they preferred this type of fresh meat to the salted meat or tough mutton. In these early years, much of the Australian cuisine was relatively bland, and potatoes were one of the main vegetables eaten. Sheep, which had successfully adapted to the Australian climate and landscape, became a staple food and today lamb is considered to be an iconic Australian food.



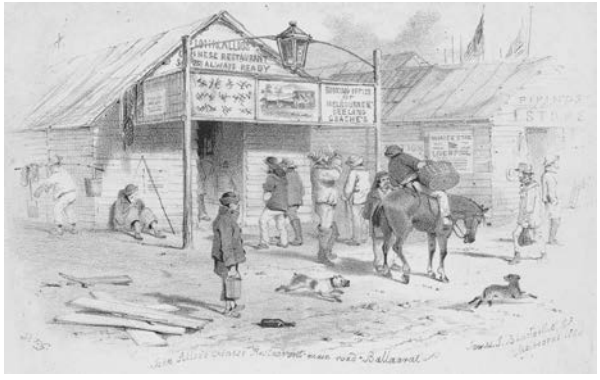
National Library of Australia (nla.obj-135247751)

An Australian free-settler home

LABOURERS TO THE NEW COLONY

The discovery of gold in 1851, in New South Wales and soon after in Victoria, sparked a new influx of migrant workers into Australia. Hopeful diggers arrived from the United Kingdom, Europe, the United States of America and China. By 1860, approximately 24 000 Chinese immigrants were working the goldfields around Ararat, Bendigo, Ballarat and Castlemaine. However, as the Chinese were disliked and seen as a threat to other miners, they often established camps on the outskirts of the main mining towns. Here they developed small gardens where they grew fresh vegetables and they also established eating houses. The eating houses sold Cantonese-style dishes cooked with fresh vegetables, pork, fish, poultry and vegetables. Despite the popularity of their food, the Chinese found it necessary to adapt their dishes, adding more meat to their dishes than was traditional in order to suit the taste of the Australian, British and European miners. Local miners soon adapted the Chinese-style of cooking to produce a 'colonial curry' – a dish that would use herbs and spices to mask the flavour and texture of the native game they had caught.

As the gold rush dwindled, many Chinese stayed on in Australia and established new enterprises. Fishing around Sydney and Melbourne was once prolific, and the Chinese cured and dried the fish, which they then sold to other members of the Chinese community throughout the country. Other Chinese migrants, who had come from rural areas in China, established successful market gardens. These gardens were very labour intensive and the workers used handmade tools to tend their plants. They used a system of crop rotation to grow green leafy vegetables, cauliflower, herbs and tomatoes. The Chinese soon dominated the



State Library of Victoria (H11862)

The Chinese established some of the first restaurants in the goldfields.



National Library of Australia (nla.obj-140626205)

Chinese market gardeners sold their fresh produce to the gold diggers.

production and sale of fresh vegetables and fruit in New South Wales and Victoria.

Following the demise of the gold rush, some enterprising Chinese began to open restaurants or 'cookshops' in Melbourne and Sydney. The majority of the Chinese had come from the south of China, the home of Cantonese cooking. This style of cooking is based on the freshest ingredients such as fresh vegetables, pork, fish, poultry and herbs and spices. Rice is also a key ingredient in Cantonese cooking and is an accompaniment to most dishes. In Melbourne the Chinese community established their restaurants in Little Bourke Street and these restaurants quickly became a magnet for city workers and students.

Following World War II, the Chinese began to open cafes in other inner suburban areas, including Brunswick, Fitzroy and St Kilda. By the 1960s, Chinese cafes could be found in most Melbourne suburbs, providing new taste sensations for all Melburnians. It wasn't long before Australian parents began to cook their own version of chow mein or chop suey!

EUROPEAN IMMIGRATION POST-WORLD WAR II

After World War II, the Australian Government embarked on a radical new immigration policy in an effort to increase Australia's relatively small population. 'Populate or perish' became the new government slogan, and between 1945 and 1952 more than 171 000 migrants arrived on Australia's shores. Many immigrants from the United Kingdom and Ireland arrived as part of the Assisted Passage Migration Scheme and were soon nicknamed 'ten pound poms'.



Fairfax Syndication/Harry Martin

Migrants arriving from Italy after World War II

A vast number of immigrants also arrived from Greece, the Netherlands, West Germany and Turkey. Many of these immigrants went to work on Australia's largest engineering project, the Snowy Mountains Hydro-electric Scheme. This scheme was located in southern New South Wales – it began in 1949 and was completed in 1974. The Snowy Mountains Scheme is made up of 16 major dams, 7 power stations and 225 kilometres of tunnels, pipelines and aqueducts.

Over 100 000 people worked on the project, 70 per cent of whom were assisted migrants who came to Australia from Europe following World War II. Migrants from over 30 countries, including Germany, Greece, Ireland, the United Kingdom, Italy, Norway, Poland and Yugoslavia, who had engineering or construction skills, were selected to work on this major project. When they arrived in Australia these migrants brought with them their own foods and food culture, which soon began to alter the way the Australian meals were prepared and presented. Mums and dads who had traditionally cooked a meal of 'meat and three veg' slowly began to use a greater variety of ingredients, including spaghetti, salami,



iStock.com/Dirk Richter

Stuffed cabbage rolls were introduced to the Australian menu by Polish immigrants.



State Library of Victoria (H2011.150/26)

Lygon Food Store

olive oil, garlic, crusty Italian bread, Polish sausage, sauerkraut, pickled cucumbers, anchovies, olives, feta cheese and smoked meats.

In 1950s and 1960s, in the wake of postwar immigration, a number of Italian cafes and food stores opened in Melbourne. Many Italian families lived in and around Carlton. Carlton became the focal point for Italian cuisine and was soon considered to be Australia's 'Little Italy'. Lygon Street became the hub of the Italian restaurant and cafe scene. The Lygon Food Store opened in 1951 and began importing ingredients key to Italian cuisine such as parmesan cheese and prosciutto. In 1954, the first espresso coffee machine to arrive in Melbourne was installed at Pellegrini's, in Bourke Street. Today, Pellegrini's is considered to be a Melbourne institution. Melburnians took to drinking strong Italian coffee with enthusiasm, and other Italian-style cafes opened, such as Grinders Coffee House on Lygon Street in 1962. The first pizzeria, Toto's Pizzeria, opened in 1961. Today, there are thousands of pizza restaurants throughout Australia.

THE 1956 OLYMPIC GAMES IN MELBOURNE

The 1956 Melbourne Olympic Games was another occasion when people from all over the world arrived in Australia. Athletes from 67 nations, as well as many international visitors, came to Melbourne for the two weeks of competition. In the lead-up to the games, the Melbourne Olympic Committee advertised for international chefs to come to Melbourne to cook for the visiting athletes. Hermann Schneider, a young Swiss chef, arrived in Melbourne to cook for the French and Belgian teams. After the games, Schneider stayed in Melbourne and opened a restaurant in South Yarra, called Two Faces. This restaurant was considered to serve some of Melbourne's finest European-style food and proved to be a turning point, as the people of Australia, and Melbourne in particular, embraced international cuisine.



Alamy Stock Photo/Igor Prahin

Pellegrini's in Bourke Street, Melbourne

VIETNAMESE BOAT PEOPLE

The end of the Vietnam War in 1975 led to a wave of people, particularly those from South Vietnam, fleeing their home country. The South Vietnamese feared retribution from the North Vietnam communist leaders who now controlled the country. At the end of the war, it is estimated that more than 1 million people were sent to re-education camps and more than 65 000 Vietnamese were executed.

Many people who were desperate to leave Vietnam fled by boat, seeking asylum in other countries, mostly in neighbouring Asian countries. These people, who became known as **Vietnamese boat people**, spent years in refugee camps waiting to be resettled in another country such as the United States, Canada, Australia and New Zealand. Australia accepted approximately 137 000 Vietnamese refugees. A second wave of refugees from Cambodia, Vietnam and southern China arrived in Australia in the 1980s and 1990s, many as a result of the Vietnamese invasion of Cambodia in 1978.



News Ltd/Newspix

Vietnamese boat people

Today, vibrant Vietnamese communities are centred in the Melbourne suburbs of Richmond, Footscray, Springvale, Sunshine and St Albans. In Sydney, Bankstown, Cabramatta, Canley Vale and Fairfield have significant populations of Vietnamese-Australians. A large number of Vietnamese-Australians also live in the Brisbane suburbs of Darra and Inala.

When the Vietnamese immigrants arrived in Sydney and Melbourne in the late 1970s and early 1980s, they found that many of the foods that they had traditionally eaten were not available here. Enterprising Vietnamese men and women quickly began to establish small import businesses, bringing in many of the ingredients essential to cooking the traditional foods of their home country. Mini-supermarkets and fresh food markets soon sprang up in the Melbourne and Sydney suburbs that were home to many of the new Vietnamese migrants. Ingredients such as fish sauce, shrimp paste, Vietnamese dipping sauce, **nuoc cham**, rice vermicelli and cellophane noodles soon became more widely available. Traditional **Vietnamese herbs and spices**, including lemongrass, Vietnamese mint, Saigon cinnamon, bird's-eye chilli and kaffir lime leaves, began to be grown locally. Fruits such as mangosteen, jackfruit, durian and star apples were also grown or imported, and members of the Vietnamese community established specialist grocery stores selling their fresh produce.

Australians quickly developed a taste for these new ingredients and the *Australian Women's Weekly* published a recipe book called *Easy Vietnamese Style Cookery* as part of its bestselling cookbook series. This enabled many more people to develop the confidence to start using the new ingredients in their own cooking.

Victoria Street in the Melbourne suburb of Richmond is often called 'Little Saigon'. The street is lined with many Vietnamese restaurants, greengrocers, grocery stores and butcher shops. The Footscray market in Melbourne's north boasts



Fairfax Syndication

A Vietnamese greengrocer

the largest selection of Asian produce in inner Melbourne, selling an enormous array of fruit, vegetables, meat, fish and grocery items that are integral to Vietnamese cuisine. Similarly, Springvale in Melbourne's south has a vast number of stores and markets selling Vietnamese produce to the local community, and shoppers come to the area specifically to find the Vietnamese ingredients they love. Today, the traditional ingredients of Vietnam, such as fish sauce, lemongrass and Vietnamese mint, have become commonplace and many Australians, regardless of their heritage, use them in their everyday cooking.



Photo courtesy Rolld, rolld.com.au

Rolld is a chain that serves Vietnamese street food.

Vietnamese restaurants are a common sight throughout Australia and are seen as being great family restaurants because of their distinctive cuisine, with its fresh, light flavours and fragrant aromas. Dishes such as pho, broken rice, chicken salad with hot mint and fish with green mangoes are some of the dishes found in many of these restaurants.

Vietnamese food is also a popular takeaway food item for many Australians. The restaurant chain Rolld has focused its menu on traditional Vietnamese street food such as rice paper rolls, pho or noodle soup, noodle salads, Vietnamese pancakes and a dish called com tam (or broken rice).

Activity 7.1

Luke Nguyen

Luke Nguyen, a Vietnamese-Australian chef, is the host of a popular television series – *Luke Nguyen's Vietnam*. This program has been aired on SBS television and documents Luke's culinary journey through the country of his ancestors. Luke was born in a refugee camp in Thailand after his parents fled Vietnam following the war. His parents settled in Sydney where he grew up and later opened his award-winning restaurant, The Red Lantern.



Fairfax Syndication/Louis Douvis

Luke Nguyen

View one of the episodes of *Luke Nguyen's Vietnam* and answer the following questions:

1. Summarise the information Luke gives about two of the recipes he is about to prepare.
2. What ingredients are used to prepare each of the recipes Luke cooks?
3. Does Luke use any ingredients that are common to each of the recipes?
4. List four ingredients that you are unfamiliar with. Conduct an Internet search and briefly describe each of these ingredients and its uses.
5. What cooking methods does Luke use to prepare each of the recipes?
6. What serving suggestions does Luke give for each of the recipes he prepares?

Understanding the text

1 Outline four features of the type of food eaten by the early settlers in Australia.

2 Draw a knowledge map to demonstrate the key points about the role of the Chinese in the availability and supply of food during the gold rush.

3 Explain how the Chinese community continued to influence the type of food consumed in Australia after the decline of the gold rush.

4 What impact did the migrants who arrived in Australia after World War II have on Australian cuisine?

5 Draw a simple time line to demonstrate the spread of Italian cafes and food stores in the 1950s and 1960s.

6 Why was Hermann Schneider considered to be an influential figure in bringing international cuisine to Australia?

7 Outline the key factors that led to thousands of people fleeing Vietnam to seek refuge in Australia.

8 Draw a diagram like the one following to demonstrate:

- the strategies that members of the Vietnamese community used to access their traditional ingredients
- the types of ingredients that were soon available for consumers to purchase.



9 What role did recipe books such as those published by the *Australian Women's Weekly* play in introducing Australian cooks to the flavours of Vietnam?

10 Give three examples that show how the cuisine of Vietnam has become widely accepted by Australian consumers.

REFUGEE RESETTLEMENT IN AUSTRALIA

Since the early days of European settlement, Australia has welcomed refugees. War and the fear of persecution are the two key forces that drive people out of their home countries. Since the 1980s, thousands of people from Afghanistan, the Balkan States, the Democratic Republic of Congo, East Timor, Eritrea, Ethiopia, Iran, Iraq, Myanmar, Pakistan, Somalia, Sri Lanka and Syria have sought refuge in Australia. These people have enriched the Australian community and brought their traditional food cultures and distinctive cuisines with them.

More than 7000 refugees from war-torn Afghanistan settled in Australia in the 1980s and 1990s. Today, there are close to 20 000 Afghanis living here. Afghan cuisine is influenced by the cuisines of neighbouring countries, particularly Iran, India and Mongolia. Herbs and spices such as saffron, chilli, garam masala, cardamom, cinnamon, cumin, nutmeg, coriander and mint are key ingredients in their dishes. Rice is an important ingredient served at every meal and **chalau**, a simple dish of fluffy white rice, is a staple recipe. Many Afghanis have opened up restaurants across the country, giving Australians the opportunity to sample and enjoy this delicious cuisine.

More recently, refugees from north-west African countries, including Eritrea, Somalia and Ethiopia, have settled in Australia. As earlier migrants and refugees discovered, many of the traditional ingredients used in their homelands were initially hard to find in Australia. Somali food is a spicy mix of rich flavours and uses many of the spices from neighbouring Arab countries. Rice, garlic, coriander, chilli, cumin and cloves are key ingredients in Somali cuisine.

One of the most popular Ethiopian recipes is a thick stew called wat, which is served on traditional injera flatbread. Traditionally, wat is made with teff flour, an ingredient that until recently was not available in Australian supermarkets. With the growing diversity of the Australian population, ingredients such as teff are easier to find because supermarkets have become more willing to stock them.

Television cooking shows such as *Food Safari* and videos on YouTube enable viewers to develop an understanding of some of the key ingredients used in cuisines from the home countries of our newest settlers.



Alamy Stock Photo/Boaz Rottem

Ethiopian wat and injera

Influence of Greek immigration on Australian cuisine

The Greek community in Australia is thought to be one of the largest Greek communities in the world. According to the 2011 Census, there are 378 270 people of Greek descent in Australia, and about 47 per cent of these people have settled in Melbourne.

The first Greek migrants began arriving in Australia not long after the First Fleet, and a steady stream of Greeks seeking a new home has continued, particularly after World War II. Since that time, a vast array of ingredients traditionally associated with Greek cuisine has become widely available and these ingredients have influenced the food habits of the nation.

REGIONAL INFLUENCES ON GREEK CUISINE

Greece is situated in south-eastern Europe, on the southern tip of the Balkan Peninsula. It shares a land border with Albania, the Republic of Macedonia, Bulgaria and Turkey. The population of Greece is spread across the mainland and the 227 inhabited



Greece

islands that are scattered throughout the Aegean and Ionian Sea. Greece has the largest coastline in the Mediterranean.

Greece is a one of the most mountainous countries in Europe, with mountains covering about 80 per cent of the countryside. Generally, Greece has a Mediterranean climate, with mild, wet winters and hot dry summers. However, central Greece and some parts of the more mountainous regions of the Peloponnese – a peninsula off mainland Greece – can experience a more alpine climate.

These geographic and climatic conditions mean that there are some significant variations in the cuisine of northern and central Greece, the Peloponnese and the coastal areas and Greek islands.

The north of Greece is very mountainous and sheep and goats graze in the mountain pastures. Greek farmers use their milk to produce their famous feta cheese and also a hard, salty cheese called kefalotyri, which they use to make saganaki. This area also produces some of the country's best fruit and vegetables, including potatoes, eggplant, onions and beans. In northern areas of Greece and Macedonia, the locals are renowned for their pastries and syrup-soaked cakes.

The Peloponnese, unlike many parts of Greece, has rich, fertile soil. Olive groves are spread throughout the region and this area is especially well known for producing kalamata olives. A wide range of vegetables and fruits, including tomatoes, eggplant, artichokes, potatoes, figs and lemons, is grown throughout this region.

Activity 7.2

Taste-testing feta cheese

Aim: To compare the sensory properties of different types of feta cheese

Method

1 Taste-test a range of feta cheese types, including:
   - Greek feta
   - Australian feta
   - Danish feta

Worksheet

2 Focus on the properties of appearance, aroma, flavour and texture of each type of feta cheese. Record your results in a table like the one that follows.

3 Rank the varieties of olives and draw a facial hedonic descriptor.

Analysis

Describe the similarities and differences in the sensory properties of the three types of feta cheese. What could be the reasons for these?

Conclusion

Which types of feta cheese did you prefer? Justify your decision.

	GREEK FETA	AUSTRALIAN FETA	DANISH FETA
Appearance			
Aroma			
Flavour			
Texture			
RATINGS			
Nine-point scale 1 = dislikes very much 5 = neutral 9 = likes very much			
Facial hedonic descriptor			

The cuisine of the Greek islands and other coastal areas is light and fresh in flavour. The dishes of this area are based on locally caught seafood, especially sardines and octopus, and a wide range of vegetables that are stuffed and roasted.

TYPICAL GREEK INGREDIENTS

Feta cheese originated in Greece about 8000 BCE. Traditionally, Greek feta was made from sheep's milk, but today goat's milk is also used to produce feta cheese. It is a crumbly cheese that has a slightly grainy texture and a tangy, salty flavour. Feta is made in large blocks, sliced into portions that are then resalted. Feta is used for making spanakopita or added to salads.



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Greek salad with feta

Greek yoghurt is renowned for its thick, creamy texture and slightly sour flavour. Traditionally, Greek yoghurt was made from sheep's or goat's milk. It is used as the basis for making **tzatziki** – a yoghurt, cucumber and garlic dip. Tzatziki is often used as an accompaniment to spicy Greek meat dishes as its slightly sour flavour helps to balance the rich flavours of the meat dish. Greek yoghurt mixed with honey is also eaten as a breakfast food, accompanied by sweet poached fruit.

Filo pastry is made by layering many sheets of paper-thin dough with butter. Although filo pastry is thought to have originated in Turkey, it is often associated with Greek cuisine and is used in the preparation of many traditional Greek dishes, including baklava, spanakopita and borek. Greek cooks stretch the dough using their knuckles rather than their fingertips to prevent the dough from tearing. Filo pastry has a crisp, dry texture and gives products a delicious flaky crust.



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Baklava is a traditional Greek dessert made with filo pastry.

Olives have been grown throughout Greece for thousands of years. There are many varieties of Greek olives and they are named after their main growing region. They are an almond-shaped fruit and, depending on their variety, can be large or small, and can range in colour from black or dark purple to light green. Kalamata olives are a large, plump, deep purple olive with a smooth, meaty texture. Halkithiki olives are large green olives with a tangy flavour. Elitses olives are tiny green olives that have a sweet, fruity



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Tzatziki is made with thick Greek yoghurt.



Shutterstock.com/Africa Studio

Olives are a common ingredient in Greek cuisine.

flavour. Olives are a characteristic ingredient used in Greek cuisine. Regardless of whether olives are used to make an olive paste, served as a part of a *mezze* platter or used to make olive bread, they add to the distinctive flavour of Greek food. Olive oil is also used to preserve a wide range of foods, including cheese, roasted peppers and dried tomatoes.

Activity 7.3

Taste-testing olives

Aim: To compare the sensory properties of different types of olives

Method

Worksheet

1 Select a variety of different olives for this activity such as:
   - Kalamata olives – deep purple olives
   - Halkithiki – green olives
   - Liguria – small green to purple olives
   - Elitses – small green olives
   - Black olives.
2 Work in small teams to complete this activity: each team member prepares one quantity of the recipe for warm garlic and chilli olives provided, using a different type of olive.
3 Taste-test each of the olive types your team has made. Focus on the properties of appearance, aroma, flavour and texture of each type of olive. Record your results in a table like the one below. Remember to write the name of the type of olive being tested in the table.
4 Rank the varieties of olives (1 = most liked, 4 = least liked).

	OLIVE TYPE	OLIVE TYPE	OLIVE TYPE	OLIVE TYPE
Appearance				
Aroma				
Flavour				
Texture				
Rank 1–4				

Analysis

1 Describe the similarities and differences in the sensory properties of the types of olives. Refer to the information about olives in this chapter to inform your discussion.
2 Explain your reasons for the ranking you have given to each of the olives – focus your discussion on the sensory properties of each of the olive varieties.

Conclusion

Which of the types of olives did you prefer? Justify your decision.

Warm garlic and chilli olives

2 teaspoons olive oil
1 clove garlic, crushed
½ small red chilli, finely diced
⅓ cup olives
1 teaspoon fresh oregano, finely chopped

Method

1 Place the oil in a small frying pan and warm over a medium heat.
2 Add the garlic and chilli and cook for two minutes until the garlic is translucent and the chilli is soft and fragrant.
3 Add the olives and oregano and toss over the heat until just warm.

Olive oil is an essential ingredient in Greek cuisine. It can vary in flavour depending on the type of olives from which it is extracted and the ripeness of the olives when they are picked. Olive oil that is made from early-picked fruit has a strong, peppery flavour, while those from a late-picked crop have



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Greek cooks prefer to use olive oil in their cooking.

a soft, smooth, fragrant aroma and flavour. Extra virgin olive oil is made by simply pressing the olives and is considered to be the premium type of oil. Olive oil can be used to sauté vegetables, or to brush over lamb before it is roasted or grilled, or Greeks simply tear off a piece of their crusty bread and dip it into the oil.



iStock.com/lynnebeclu

Preserved lemons give an intense citrus flavour to dishes.

Lemons were introduced to Greece during the 1st century CE. Today, lemons are used in an endless array of Greek dishes, but are most widely known as a key ingredient in avgolemono, a lemon and egg soup, and in ladolemono, a dressing based on lemon juice used to flavour grilled fish. Preserved lemons are often used in Greek cuisine to add a zesty flavour to meat dishes, salads or as a stuffing for vegetables. Lemon gives dishes an intense, acidic, citrus flavour.

Fruit and vegetables are the basis of most Greek meals. One of the most popular methods of cooking vegetables in Greece is to stuff them. Tomatoes, zucchini, capsicum and eggplant are filled with rice and diced vegetables and baked in a tomato-based sauce. In the northern part of the country where meat is more widely used, the vegetables may be stuffed with minced lamb along with rice and other flavourings. Stuffing and baking the vegetables gives them a beautifully soft, melt-in-the-mouth texture and a rich flavour and aroma.



iStock.com/gresei

Stuffed vegetables are a popular Greek meal.

Fish and meat are also key features of Greek cuisine. Around the coastal areas, fish and seafood dishes are commonly served. Fish may be simply grilled and served with a fresh salad or baked on a bed of vegetables. Squid, octopus and sardines are often cooked quickly over a barbecue. Lamb is the meat most commonly used in Greek cuisine. It is often spit-roasted or made into a stew, with a wide variety of vegetables and herbs. One of the most well recognised Greek lamb dishes is moussaka – a dish made from minced lamb that is layered with eggplant and topped with a rich cheese sauce.

Flavourings such as garlic, onion and herbs, including oregano, parsley, celery leaves and mint, are commonly used to flavour Greek foods. These flavouring ingredients add a richness and complexity of flavour to dishes. Orange flower oil is used in delicate sweet dishes and cakes. Masticha is used as a spice in sweet foods, such as chocolates, or for flavouring yoghurt or cream. It can also add flavour to savoury dishes, especially those that are based on lemon or tomato flavours. Masticha is a resin

produced from the mastic tree that grows on the Greek island of Chios and is a prized ingredient of Greek cuisine. One of the most common uses of masticha is in the production of a Greek liqueur. When preparing the sticky masticha resin, Greek cooks use a mortar and pestle and grind it, adding a little sugar or salt to prevent it from sticking.

TYPICAL GREEK MEALS

Greece is renowned for producing a variety of dips such as taramasalata, made from fish roe, and tzatziki. Dips are served with fresh crusty bread as a part of an appetiser platter. Saganaki (a fried cheese), dolmades (traditional stuffed vine leaves) and tyropitakia (cheese triangles made with filo pastry) or **spanakopita** might also be served as an appetiser or first course. Soups including avgolemono and a bean or lentil soup are also traditionally served in Greek households. Main course dishes might include moussaka, baked or fried fish, souvlaki, stuffed vegetables and fresh salads. Greek desserts are rich and sweet and often coated in syrup. Filo pastry is often used to make sweet treats such as baklava, galaktoboureko, **loukomades** and kourabiethes.



iStock.com/kaspan

Galaktoboureko is made with filo pastry.

METHODS OF PREPARING AND SERVING GREEK FOOD

Greek cooks use a wide range of cooking methods to prepare their delicious food. Meat dishes such as lamb might be slow roasted in the oven so that the meat melts in the mouth. However, Greeks also cook their meat, especially lamb and baby goat, over coals or on a spit.

Vegetables, including potatoes and stuffed vegetables, are often baked or roasted in olive oil. Foods such as meatballs, zucchini or eggplant may be shallow-fried in oil to enrich their flavour. Other dishes, such as moussaka, are covered with a thick béchamel sauce and then slowly baked.

Greek meals are an opportunity to talk and share food with family and friends. Lunch is often seen as the main meal of the day and may not be eaten until about 2 p.m. It might consist of a number of courses, including appetisers, soups and a main course. Like many of their European neighbours, Greeks traditionally have a late evening meal, often around 10 p.m. Dinners are a shared event and a variety of dishes are placed on the table for everyone to help themselves.

As dinner is often served late, many Greeks have a snack in the late afternoon when small portions of food called *mezze* are served. A *mezze* platter normally consists of dips, such as taramasalata and tzatziki, served with Greek bread, olive oil and olives. Fresh vegetables or dolmades and a variety of cheeses may also be included.

GREEK CUSTOMS AND CELEBRATION

The vast majority of the Greek population is Greek Orthodox; therefore celebrations are based on the festivals of the Church. Fasting is a key part of many of the religious festivals and, during these times, meat and fish, and sometimes oil, are not permitted.

Easter

Easter is the most important festival in Greece and Easter Sunday is a day of great celebration. A lavish meal is prepared to celebrate the end of the fasting period of Lent and roasted lamb is often central to this meal. A lamb or baby goat might be spit-roasted over hot coals and served alongside platters of roasted and stuffed vegetables, salads, seafood, rice dishes and an array of different cheeses. Families spend days preparing **koulourakia**, twisted butter biscuits, and traditional Greek Easter bread, studded with dyed, hard-boiled eggs.

One of the features of Greek Easter celebrations is a game played by family members in which they challenge each other to crack their red-dyed, hard-boiled eggs. The winner is the one whose egg outlasts the others; it is believed that they will enjoy good luck for the forthcoming year.



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Greek Easter bread

Christmas

Christmas celebrations are a little more subdued than those of Easter. Fish is usually eaten on Christmas Eve, while on Christmas Day, celebrations revolve around a meat dish such as roast pork, or a chicken or turkey stuffed with rice and raisins. A soup, usually avgolemono, feta, olives, tzatziki, vegetable dishes and salads are all traditional foods served at a Christmas feast. Sweet treats such as loukomades, delicate, golden balls of deep-fried dough drizzled with honey and cinnamon, and kourabiethes, a butter biscuit, also adorn the Christmas table.



Shutterstock.com/haris M

Loukomades are a traditional Greek dessert.

Understanding the text

11 Draw a knowledge map to demonstrate the way more recent refugee communities have had an impact on the food of Australia since the 1980s.

12 Draw a rough sketch map of Greece and annotate it to show how its geography and climate have influenced traditional Greek food.

13 What is feta and how is it commonly used in Greek cuisine?

14 How do Greek cooks prepare filo pastry so that it does not break? List three common uses of filo pastry in Greek cooking.

15 Describe the difference in the characteristics of early- and late-picked olive oil.

16 Draw a diagram like the one that follows to summarise key information about the fruit and vegetables, fish and meat and flavourings popular in Greek cuisine.

Fruit and vegetables	Fish and meat	Flavourings

17 Prepare a summary table of the foods eaten at typical Greek meals. List the information under the following headings:

- Appetisers
- Main course dishes
- Desserts

18 Outline some of the main characteristics of Greek meal times.

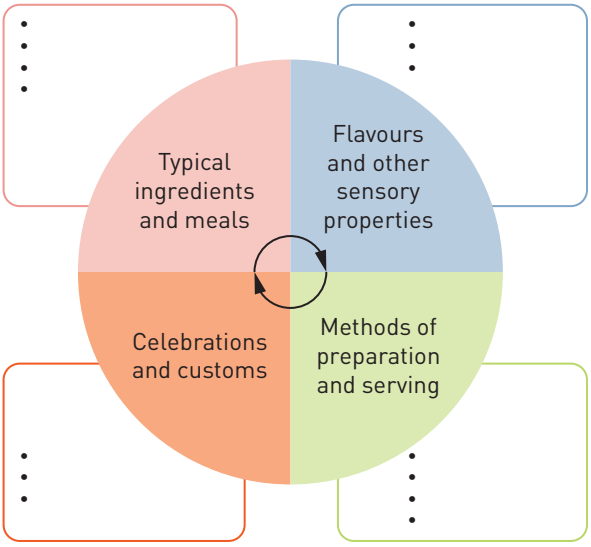
19 Describe the main foods eaten during a Greek Easter celebration.

20 List some of the main foods that a family would traditionally serve at Christmas in Greece.

THINKING SKILLS

Prepare a diagram to identify the following characteristics of Greek cuisine:

- typical ingredients and meals
- flavours and other sensory properties
- methods of preparation and serving
- celebrations and customs.



FOOD TRENDS DRIVEN BY CHANGING SOCIAL BEHAVIOURS



8

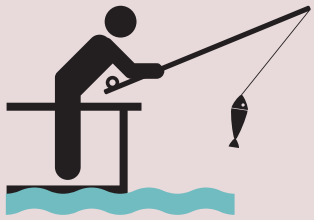
FOOD IN CONTEMPORARY AUSTRALIA

FOOD SUBCULTURES IN CONTEMPORARY AUSTRALIA

ORGANIC MOVEMENT



SUSTAINABLE FOOD AND SLOW FOOD MOVEMENTS



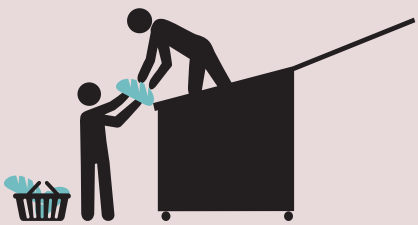
LOCAVORES



VEGETARIANISM



FREEGANISM



KEY TERMS

Coffee culture refers to a social atmosphere or social behaviour that depends heavily on coffee.

Contemporary food is a term used to describe the present period of time and it is often used to describe current food practices in Australia.

Ethnic foods refers to foods that originate from a distinctive heritage, culture or tradition.

Freeganism refers to people who eat the food others have rejected in order to reduce the carbon output produced by food that is wasted.

Functional foods refers to foods that provide a health benefit beyond basic nutrition.

Fusion foods are foods that are a combination of different cuisines in a single eating experience.

Locavores are people who only eat food that is farmed or produced in their local area.

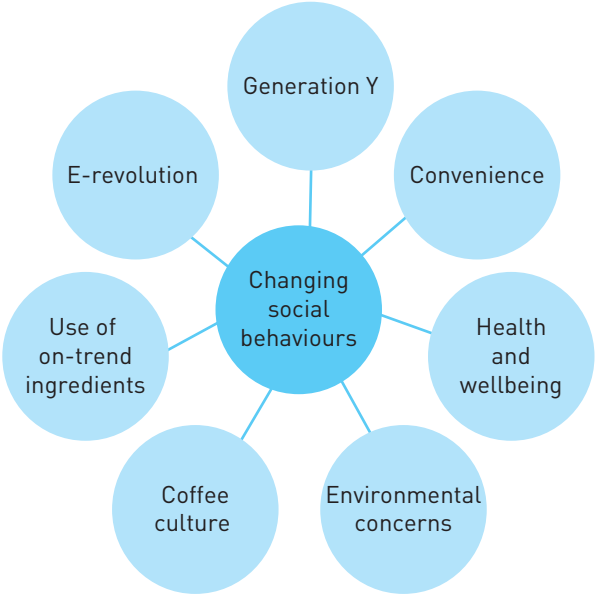
Organic food system refers to a food production system that produces food without the use of pesticides, herbicides or chemical fertilisers.

Subculture refers to a group of people who have a view that is different from that held by the majority of the community.

Food trends driven by changing social behaviours

Food producers and restaurateurs constantly ponder the question 'What's hot and what's not?' Their businesses depend on keeping up with the latest ideas and consumer demands. For three or four years, macarons and cupcakes were the latest fashion food product demanded by consumers, but by 2016 these were 'so yesterday!' The doughnut and Nutella – often in combination – became the latest rage.

Other trends seem to be driven by consumers' desire for foods that are good for health or environmentally sustainable, or their search for more interesting ingredients.



The changing social behaviours of consumers

GEN Y OR MILLENNIALS

Gen Y or Millennials are the new trendsetters. One of the distinctive characteristics of Gen Y is that they tend to snack rather than eat the traditional three meals a day. This trend has led many restaurants to base their menu on shared plates. Communal dining – very 'on trend' – is popular with young people who will happily share a table with others they don't know. The members of this group are proud to be 'foodies'; they love to read blogs about food and use social media such as Instagram to share their food experiences with their friends. They also use apps to scan the barcode of a product to find out more information about it before they purchase it.

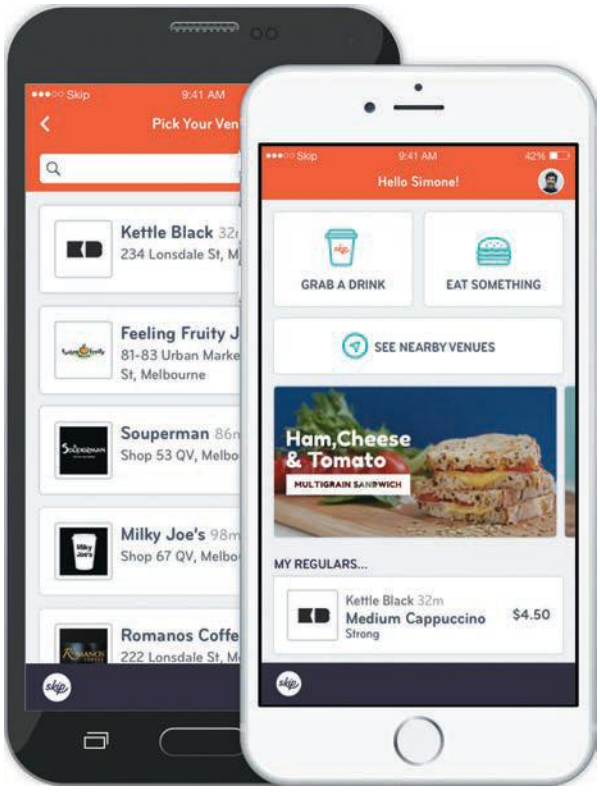


Alamy Stock Photo/Hero Images Inc

Communal dining is popular with Gen Y or Millennials

THE DESIRE FOR CONVENIENCE PRODUCTS

Convenience is a key driver in the creation of many new Australian food products. Meal components that are pre-prepared and simply need to be pan-fried or heated up in the microwave are becoming increasingly popular as more consumers struggle to juggle the demands of work and family life. Supermarkets now stock an array of fresh, ready-to-heat products in the chill cabinet of their deli department. The number of frozen meals in the freezer section of the supermarket is also expanding to meet consumer demand.



© 2014 Skip

The 'skip' app allows consumers to skip the queue.

For consumers who don't want to queue up to buy their takeaway coffee or lunch, it is now possible to download an app that allows them to order and pay for their meals, adding to the convenience of these products. Apps such as 'skip' encourage the time-poor consumer to order their coffee or lunch in advance so that they can skip the queue.

Another convenient meal option that has seen an upsurge in popularity is the home-delivered meal kit. Companies such as HelloFresh, MyFoodBag and Culinary Carton deliver a box or bag of food that contains all of the components necessary to cook the family dinner. All the ingredients are supplied with an easy-to-follow recipe card and the promise that the cook can have a meal on the table in less than 30 minutes! These meals are popular as the cook has the satisfaction of having prepared a home-cooked meal from fresh, seasonal ingredients, but without the hassle of having to spend time shopping or preparing some of the key components of the meal.



HelloFresh

Many consumers order a meal kit instead of shopping for ingredients.

Food trucks are also becoming popular as they provide a contemporary version of takeaway food and quick-service restaurants, and are often seen as providing a healthier alternative to traditional fast-food outlets. Many of these food trucks set up near a large office block where they can attract workers who want a quick, convenient lunch. Diners can easily check social media to find out where the truck will be located.

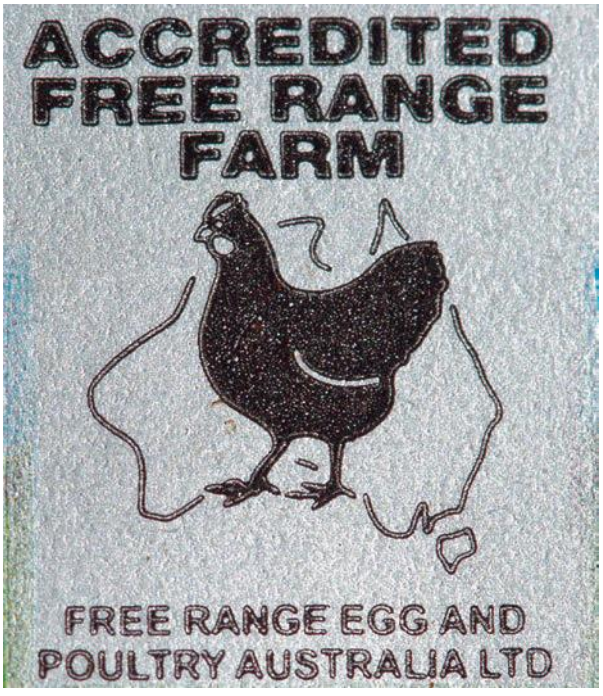


Shutterstock.com/Sunflowerey

Food trucks provide an alternative to traditional fast-food outlets.

CONCERN FOR THE ENVIRONMENT

Sustainability and security of the world's food supplies have become a concern for many consumers. The threat of climate change, the impact of agricultural production on the environment and foreign ownership of Australian farming land are leading more consumers to seek products that have a minimal environmental impact or are produced using more



Gray Human Photography

This logo informs consumers the product comes from an accredited free-range farm.



Rainforest Alliance



Humane Society International Australia



Copyright RSPCA Australia

Many consumers look for products that are produced ethically.

humane methods. Foods such as cage-free eggs, free-range poultry and pork are now the choice of many consumers. Many consumers now check the label of products to make sure that the product does not contain palm oil, for example, as this product is closely linked to the destruction of many of the world's rainforests. Similarly, shoppers are now able to check whether the canned tuna they are about to purchase is sourced from an endangered species or caught using methods that might harm dolphin populations.

One of the other important trends is the desire of many consumers for fresh, locally sourced produce. There is a move away from the mass-produced food products in supermarkets to products from local suppliers or farmers' markets.

HEALTH AND WELLBEING

Most Australians are now living longer and many expect food to play an important role in their health and wellbeing. **Functional foods**, that is, foods that provide a health benefit beyond basic nutrition – for example, by adding omega-3 to a food that does not normally contain this nutrient, or by decreasing the fat content of a traditional food such as milk – are growing in popularity. Issues such as the growing levels of obesity in the community have a huge impact on the health of the nation. This has led to a trend for consumers to seek products that contain 'good-for-you' ingredients. There is also a desire by consumers to choose food products that are less processed and closer to their natural state because there is a belief that these foods will provide 'instant, feel-good cures' for health issues.

The 'free-from' trend is also on the rise, with the exclusion of dairy and sugar as 'no go' ingredients, and avoidance of products containing genetically modified ingredients is also increasing.

The rise in gluten-free products, for example, has come about in part because many consumers feel these products are healthier and include wholesome ingredients, even though the consumer may not be gluten intolerant. This has led to an explosion of gluten-free flours such as those from legumes, ancient grains, teff and nuts which are used as a substitute for wheat flour. As a consequence, the gluten-free section of the supermarket has increased considerably as consumer demand has grown.

Many consumers are attempting to eat less cane sugar so they are sweetening their foods with natural sweeteners such as maple syrup, agave syrup, stevia and coconut palm sugar. Even though these natural sweeteners contain sugar, they are perceived as healthier than 'added sugar'.

Full-fat products are no longer considered to be the 'enemy' and they are beginning to regain favour with consumers, replacing reduced-fat products.



'Free-from' products are becoming increasingly popular.

THE COFFEE CULTURE

The British tradition of tea drinking was very popular until World War II. Postwar migrants, and Italian migrants in particular, introduced Australians to strong espresso coffee. Today, Australia has developed a distinctive **coffee culture**; that is, a social atmosphere or social behaviour that depends heavily on coffee. Cafes and coffee houses now seem to be on every street in our suburbs, city lanes and country towns, with people using the cafe to meet and socialise with friends, read the newspaper or for work meetings with colleagues. 'Let's meet for a coffee' is a phrase constantly used by people as they plan how and when to catch up with friends.

Australians' love of coffee has grown strongly since 2010. By 2016, the annual growth rate in the industry is expected to have increased by 7.4 per cent, bringing the value of the industry to approximately $5.3 billion. Today, Australians consume more coffee than any other hot beverage. Many coffee drinkers are also demanding that the coffee they purchase and consume is ethically produced.



Alamy Stock Photo/Hawkeye86

Cafes are now a part of our neighbourhood scene.

THE BREAKFAST CLUB

Heading out for breakfast has become one of the hottest trends and greatest changes in social behaviour in the past two decades. Breakfast out with friends is now one of the most popular ways to catch up. Long gone are the days of spending hours preparing for an elaborate dinner party – now it's more common to take the family and catch up with friends over poached eggs on toast or ricotta pancakes. Breakfast out is also seen as a cheaper option than a restaurant dinner for many families, and it suits our casual lifestyle.



Shutterstock.com/deedl

Breakfast is great way to catch up with friends.

Bill Granger is reputed to have put breakfast on the 'dining menu' when he started serving his famous creamy scrambled eggs at his first Sydney restaurant, Bills. Cafe owners and chefs have risen to the challenge and now present breakfast menus that are based on fresh flavours and the latest on-trend ingredients.

THE E-FOOD REVOLUTION

Food purchasing in Australia today is being influenced by the use of technology or the e-revolution. A growing number of people order their food online from supermarkets which then deliver it directly to their homes. Consumers who are time-poor or simply dislike pushing the trolley around the supermarket aisle with their children in tow are now using the online services offered by all the major supermarkets.



Alamy Stock Photo/Cultura Creative

Posting photos on Instagram allows friends to share food creations.

Social media also play a significant role in the way people share their enjoyment of food. Social media platforms such as Instagram and Facebook allow the home cook to post images of their latest creations so that food ideas are shared. Family and friends share their cooking skills with one another and create a profile based on their culinary ability.

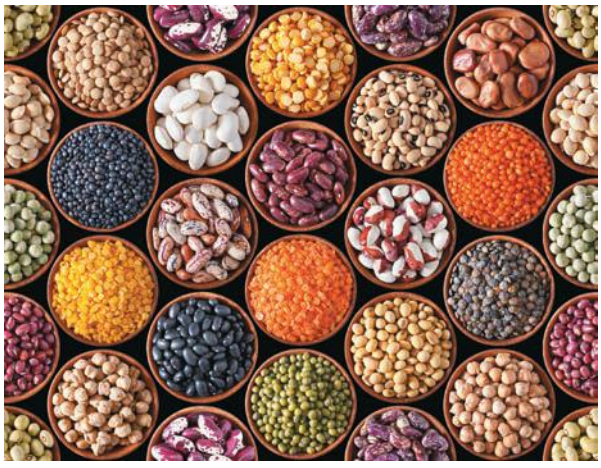
ON-TREND INGREDIENTS AND FOODS

Australian cooks are now much more adventurous and willing to try **contemporary foods** – new flavours, ingredients and cooking methods. In recent years, there has been a trend towards preparing and using fermented or cultured foods such as sauerkraut or cultured beetroot because these products are thought to be good for health. Consumers are also eating more green vegetables, and ingredients such as kale are added to smoothies, which has become an enjoyable way for many people to increase their vegetable intake.

Other consumers are actively looking for products from all over the world. Sriracha, a hot sauce from Thailand, is a popular sauce to add a spicy flavour to dishes. Other spices that are increasing in popularity are ghost peppers from India, sambal from South-East Asia, gochujang from Korea, and harissa, sumac and dukkah from North Africa.

Another on-trend cooking technique is charred, burnt or smoked foods. Charred vegetables as side dishes, desserts with charred fruits and burnt-sugar toppings, smoked salt and smoky syrups are becoming popular, both to prepare at home or to order when eating out.

In recent years, there has also been a move to encourage Australians to include more legumes and pulses in their diet. The year 2016 was International



Placeholder photo acknowledgement

Consumers are becoming more aware of the importance of pulses in their diets.

Year of Pulses and campaigns during the year encouraged a greater awareness of crops such as lentils, beans and chickpeas. The goal of this campaign was to heighten awareness of the nutritional benefits of pulses as part of sustainable food production.

Activity 8.1

Social media food posts

Social media photo-sharing sites such as Instagram, Facebook, Pinterest and Snapchat are a fun way to share your latest food creation. Many people use these sites to post a photo of the great dish they have just created or the meal they are about to eat at a cafe.

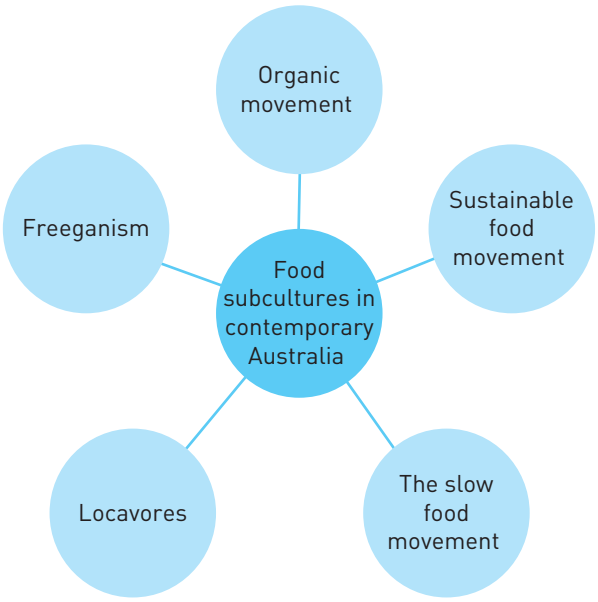
Complete the following activity about your use of social media in sharing your favourite food photos with your friends.

Worksheet

1. Which social media site do you most commonly use to share photos? Explain why you prefer this site to others.
2. How frequently do you upload photos to a social media site to show the food you have prepared or the food you have eaten when you are out? Comment on whether you do this regularly or hardly ever.
3. Provide examples of the photos that you have in your photo gallery, or the food photos of a friend, that reflect the following trends:
   - shared plates
   - fusion cooking
   - a cafe breakfast
   - the use of 'on-trend' ingredients.
4. Provide photos of three dishes you have prepared yourself that are contemporary Australian foods. Annotate the photos to explain the ingredients, cooking methods or method of plating that demonstrate a contemporary flair.

Food subcultures in contemporary Australia

Australians have a wide range of fresh food to choose from when planning weekly meals. However, while the vast majority of the population is happy to shop at the local supermarket or purchase the bread, milk, fruit and vegetables supplied by Australia's large food processors, other people hold strong views about the sustainability of the environment or the importance of minimising the amount of pesticides and herbicides they and their children are exposed to. These beliefs have led to the development of various **subcultures** or groups of people who have a view that is different from the views held by the majority of the population.



Food subcultures in contemporary Australia

THE ORGANIC MOVEMENT

An **organic food system** is a production system that produces food without the use of pesticides, herbicides or chemical fertilisers. Some people choose to buy organic or biodynamic produce because they feel it is healthier to avoid the pesticides and herbicides that are frequently used to produce the food we eat. While many supermarkets and fresh food markets now stock organic products, the range can be limited and the produce is often more expensive to purchase.



Ainsley Ryan

There is a strong trend towards purchasing organic foods.

Some speciality organic and wholefood shops are now beginning to appear, but these are often only located in metropolitan areas or large regional towns.

THE SUSTAINABLE FOOD MOVEMENT

The sustainable food movement encourages consumers to purchase food that has been produced using systems that do not damage the environment so that breeds of fish, rare breeds of animals and farming land will be available for future generations. Friends of the Earth Australia is a group that works for social justice and sustainability for food and farming. It challenges the agri-food businesses that dominate our food production system. This subculture is committed to lobbying for safe, healthy and nutritious food that is sold at a fair price for farmers. It aims to improve animal welfare and promote environmental protection by conserving natural resources such as water, soil and agricultural biodiversity. The members promote their cause through farmers' markets, the Fairtrade movement and food cooperatives.

Friends of the Earth

Friends of the Earth promotes environmental sustainability.

THE SLOW FOOD MOVEMENT

The slow food movement was formed in Italy in 1989 as a protest against fast food. In Australia the mission of the movement focuses on encouraging people to understand where food comes from, how it was produced and by whom. It encourages people to eat locally and to purchase foods that have been produced by sustainable methods. The Slow Food Australia group organises educational activities and programs for children, such as helping to construct school kitchen gardens and organising farm visits and practical workshops with food producers to educate children about the types and origin of foods.

Slow Food Australia

The slow food movement encourages people to choose sustainably produced food.

LOCAVORES

Locavores are people who only eat food products that are farmed or produced in their local area. This ensures that everything they eat is fresh and has not travelled an excessive number of 'food miles'. This 'local food' theme is now evident in food magazines and on restaurant menus, and local food movements are appearing in farming regions across Australia. For many farmers whose food products are being threatened by cheaper imports, this movement is very welcome as it allows the revitalisation of regions based on food tourism.

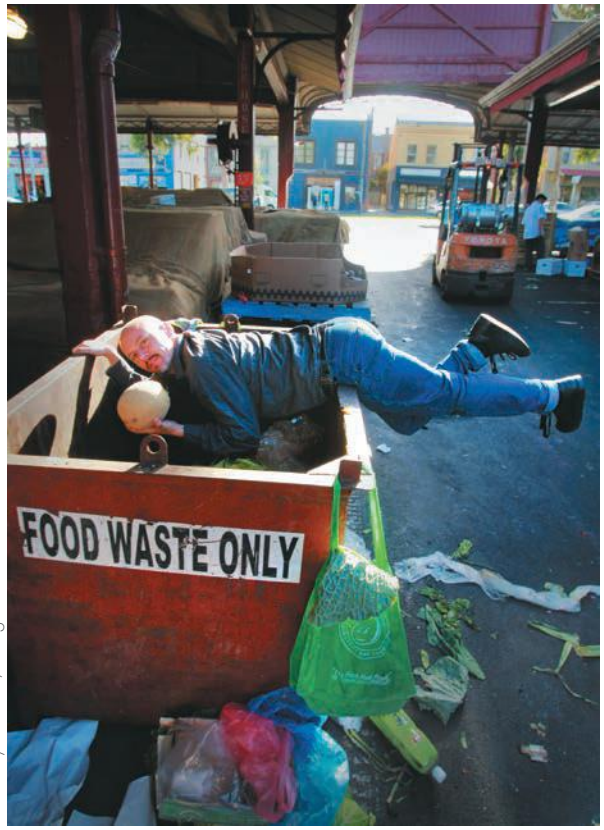


Shutterstock.com/wavebreakmedia

The local food movement aims to minimise the distance food travels.

FREEGANISM

The **freeganism** movement is made up of people who eat the food that others have rejected in order to reduce the carbon output produced by food that is wasted. This free food is typically thrown out by supermarkets and is unopened, or has slightly damaged packaging and is usually just within its 'use-by' date. This group believes that they not only save money on groceries, they also reduce waste and prevent unwanted food from being sent to landfill. Freeganists also believe that by 'rescuing' food that would otherwise be sent to landfill they are saving all of the vital resources that go into its production, including the nutrients from the soil and water. It also has the added environmental benefit of reducing the amount of methane that would be produced if the food was left to break down in landfill.



Fairfax Syndication/Craig Sillitoe

A 'freeganist' or 'dumpster diver' raiding a waste bin

Understanding the text

1 Describe two features of Gen Y or Millennials that are influencing current food trends.

2 Draw a knowledge map to demonstrate the way the demand for convenience has influenced our food options.

3 Draw a diagram to demonstrate the strategies that consumers who are concerned about the environment and the humane treatment of animals can use when shopping for food.

4 Outline two new consumer trends that are linked to health and wellbeing.

5 Explain how the growing coffee culture has affected the community and the Australian economy.

6 Why has breakfast out become one of the hottest food trends?

7 Describe two ways in which the use of technology has had an impact on the way consumers shop for food and share their enjoyment of food.

8 Draw a knowledge map to demonstrate the latest on-trend ingredients and foods. Include two examples of the latest trends in food or ingredients not listed in the chapter.

9 Draw a diagram like the one that follows to summarise key information about the organic food movement, the sustainable food movement, the slow food movement and locavores.

Organic food movement	Sustainable food movement	Slow food movement	Locavores

10 What is the freeganism movement? Outline two key points to explain why some people join this movement.

Influence of Australian chefs and recipe books on Australian cuisine

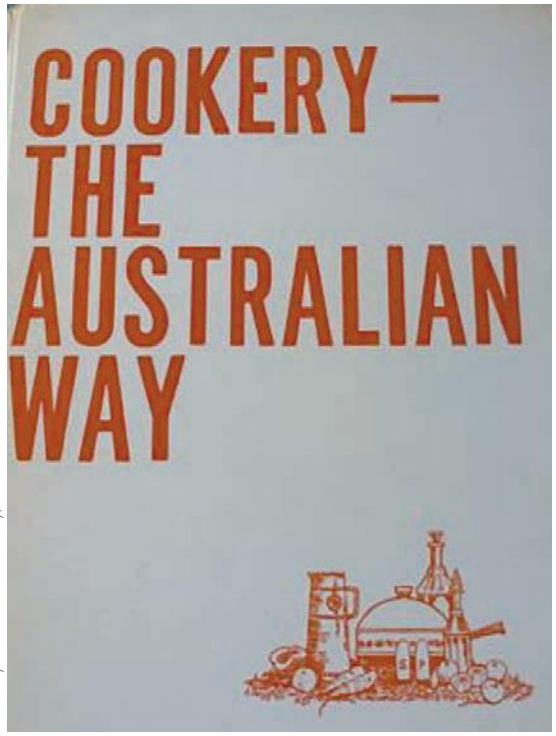
Australian cuisine has come a long way in recent years and while 'meat and three veg' might still be popular with many people, others are beginning to experiment with the new flavours and cooking methods they read about in recipe books or see demonstrated on television cooking programs.

Australia has been blessed with a significant number of creative chefs and cookbook authors who have guided us in the move away from the classic British foods of our past and into a future of exciting new flavours.

COOKERY THE AUSTRALIAN WAY

Cookery the Australian Way was first published in 1966 as a textbook for senior high school students interested in learning about cookery. Early editions of the book were prepared and written by a committee of home economists and teachers of Home Economics in Victoria. It became an essential reference book for many Australian cooks, who found it contained a wide range of information about ingredients and cooking processes and recipes that were easy to follow. For many people, the sections on 'what went wrong and why?' proved invaluable when a recipe disaster loomed.

Subsequent editions have always included the basic tried-and-true recipes along with the latest changes in trends and tastes in food. In 2016, the book celebrated 50 years of publication.



Cookery the Australian Way, 1966 © Macmillan Education Australia

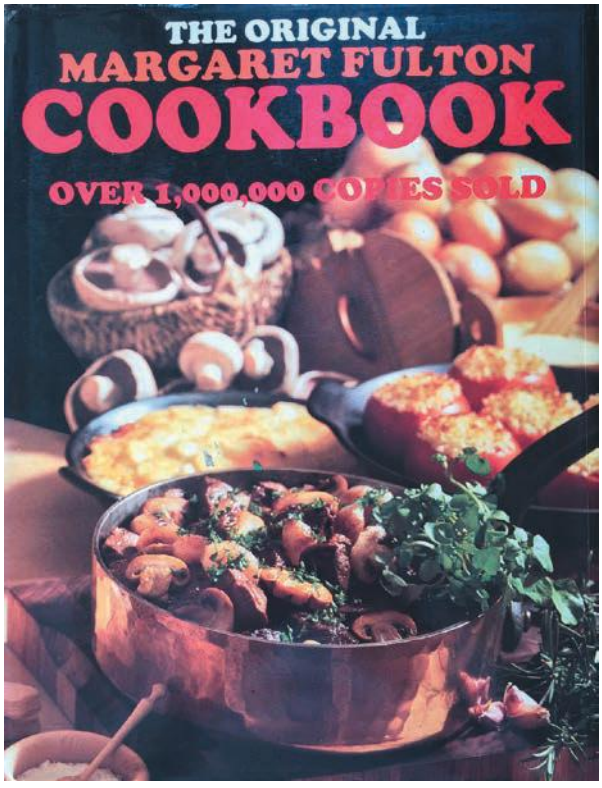
The first edition of Cookery the Australian Way, published in 1967

MARGARET FULTON

Margaret Fulton published her first recipe book, *The Margaret Fulton Cookbook*, in 1968; more than 1.5 million copies have been sold since. She is credited with teaching many generations of Australians how to cook and with changing the way Australians eat. Her books include recipes from Spain, Italy, India and China. She encouraged Australian cooks to experiment with flavours and to be creative with their food.

THE *AUSTRALIAN WOMEN'S WEEKLY* COOKBOOK SERIES

The *Australian Women's Weekly* has been teaching Australians how to cook since 1976. It publishes a stable of cookbooks that cover all aspects of cooking, including basic cooking, baking, Christmas recipes, entertaining, international cookbooks and the very popular cake decorating books. The *Australian Women's Weekly* cookbooks have guided cooks for decades, and many Australian homes have a number of them lining their kitchen shelves or bookcases. Much of the books' popularity is based on the simplicity of the recipes and the fact that every recipe is photographed, so that the home cook can see how their finished product will look.



Reproduced with permission of Margaret Fulton

The Margaret Fulton Cookbook has changed the way Australians eat.

ELIZABETH CHONG

Since arriving in Australia at the age of three, Elizabeth Chong has become one of Australia's most influential authors and teachers of Chinese cooking. She is considered to be an authority on Chinese and Asian cuisine and has introduced many Australians to the art of cooking Asian dishes through her much-loved cooking schools and Asian food tours.



Newspix/Rob Baird

Elizabeth Chong is one of Australia's most respected teachers of Chinese cooking.

STEPHANIE ALEXANDER

Stephanie Alexander's *The Cook's Companion*, first published in 1996, is considered by many people to be the Australian 'food bible'. The book contains a wealth of information about ingredients, cooking techniques and equipment. If they are unsure, a cook can find information about the varieties of a particular ingredient and how to select, store and prepare it. Cooks also love her fail-safe recipes and the hints and suggestions about flavour combinations.

Stephanie has also been recognised for her work in developing the Stephanie Alexander Kitchen Garden Foundation, a program that aims to encourage children in the love of fresh, seasonal food and in developing healthy food habits for life.

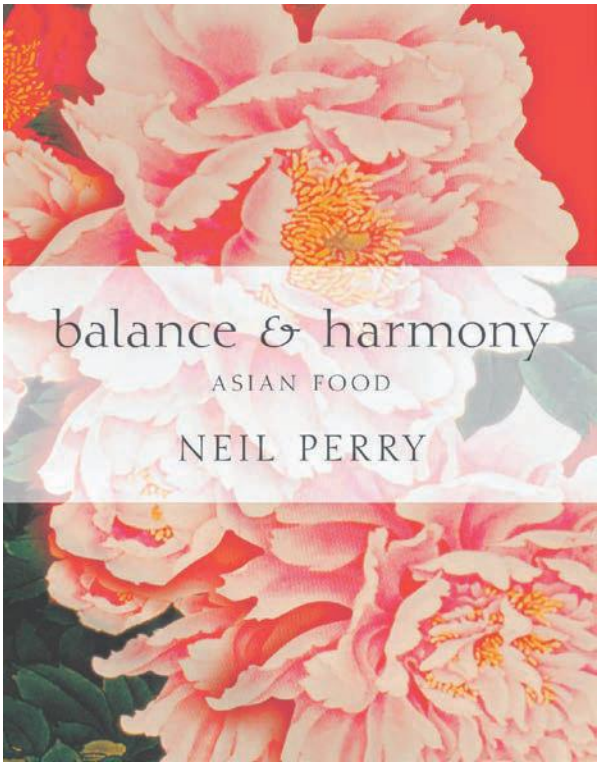


Fairfax Syndication/Tanya Lake

The Cook's Companion has become one of Australia's favourite cookbooks.

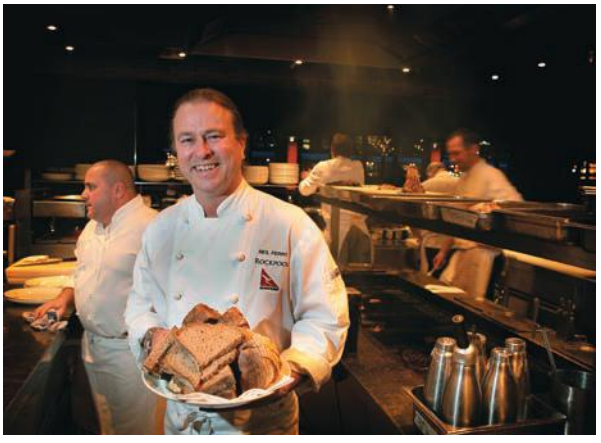
NEIL PERRY

Neil Perry is one of Australia's most well-respected chefs, restaurateurs and food authors. Neil co-owns and is executive chef at a number of Melbourne and Sydney restaurants. He is well known for his modern Australian cooking and is considered to be an expert on Asian cuisine. He has written many recipe books, including *Spice Temple*, *Balance & Harmony: Asian Food*, *Good Food* and *Food I Love*. Neil Perry is also involved in designing the recipes and menus used by Qantas.



Cover image from *Balance & Harmony* by Neil Perry (Murdoch Books, 2008), reproduced with permission of Allen & Unwin Pty Ltd.

Balance & Harmony by Neil Perry



Fairfax Syndication/John Woudstra

Neil Perry's is one of Australia's top restaurateurs.

BILL GRANGER

Bill Granger describes himself as a self-taught cook, restaurateur and author. Bill developed a love of food during his years working as a waiter while he was at university. He opened his first restaurant, Bills, in Sydney and soon became well known for his specialty, creamy scrambled eggs. Today, he has restaurants in Tokyo, London and Hawaii where he is known for his



AAP Image/AC Agency/Chris Terry

Bill Granger is known for his simple but eclectic cuisine.

simple but eclectic cuisine. His recipe books include many of his favourite recipes and provide a wealth of information to help cooks prepare them successfully. He writes regularly for the media and contributes food articles to magazines such as *Delicious*.

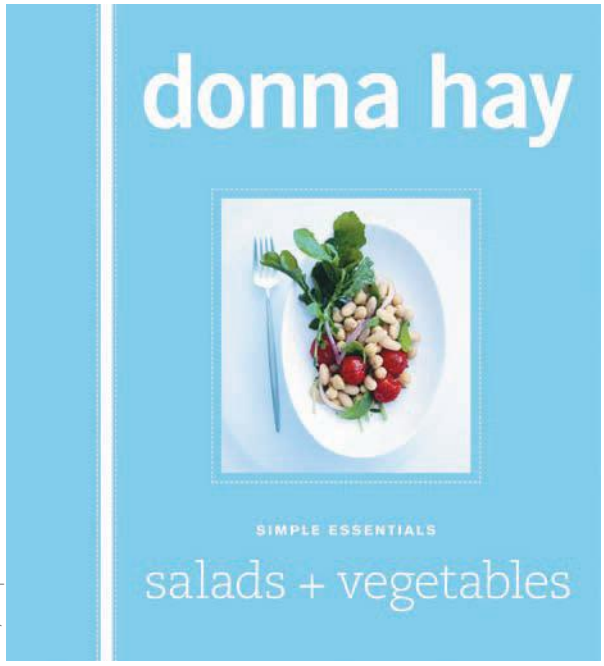
DONNA HAY

Food writers such as Donna Hay have inspired many Australian cooks. Donna has produced numerous recipe books and made many appearances on television programs such as *Better Homes and Gardens* and *MasterChef*. Her cookbooks have great visual appeal and simplicity, and are created and presented in an innovative style. She has inspired many home cooks by including recipes that are achievable, with valuable 'tips and tricks' to assist the new and not-so-new cook.

CELEBRITY CHEFS

Many of our top restaurant chefs have become household celebrities who appear on our television screens on programs such as *MasterChef*, or who write recipe books or feature articles in newspapers and magazines or become ambassadors for one of the big supermarket chains.

George Calombaris, Peter Gilmore, Kylie Kwong, Karen Martini, Gary Mehigan, Alla Wolf-Tasker, Matt Moran, Anna Polyviou, Toby Puttock, Christine Manfield, Ben Shewry, Curtis Stone, Kirsten Tibballs, Tetsuya Wakuda and Adriano Zumbo are just some of the chefs who have had a significant influence on contemporary Australian cuisine. These chefs have introduced the Australian public to new flavours, cooking techniques and the wonders of experimenting with new ingredients.



AAP/HarperCollins Australia

Donna Hay cookbooks are popular with many home cooks.



AAP Image/Penguin

Matt Moran's salads are created using a variety of innovative ingredients and flavours.

Activity 8.2

Chefs' recipes

You and a partner have to plan and prepare a two-course meal based on the recipes of a well-respected Australian chef such as one of those mentioned in this chapter.

WS Worksheet

1. With your partner, decide which chef you would like to use as the inspiration for your meal.
2. Use the resources of your school library or local library, or your food and technology centre to search for an entrée, main course and dessert recipe.

3 With your partner, decide which two courses you would like to prepare. In selecting the recipes, consider the following issues.
   - Are the ingredients available? Will there be some that are difficult or too expensive to purchase? You may need to negotiate this with your teacher!
   - How long will each recipe take to prepare and cook? You must be able to complete the meal within your normal class production session.
   - Do you have the skills to produce each of the processes in the recipe? Are there some processes that you haven't used before? Will you need to practise these at home before class?
   - The two courses must be from the same chef and should complement each other.
4 Each person should prepare and serve one of the two courses.
5 Prepare an evaluation of the two-course meal. Your evaluation should focus on:
   - the sensory properties of the meal – describe the meal using descriptive language
   - the ease of following the recipe – were the instructions easy to follow or did you need to ask your teacher or parent to help clarify some steps in the recipe?
   - the style of the recipe – is it a contemporary approach to food preparation or is it a more traditional recipe?
   - the cooking methods used – were they challenging or were they within your present skill set?
   - whether you would make this recipe again or recommend it to others – remember to explain your answer, justifying your point of view.

Does Australia have its own distinctive cuisine?

Food is a very big part of contemporary Australian life and while there are many dishes we may think of as typically Australian, the question we need to ask is do we have a national cuisine?

When we get together with friends it is often over a barbecue. Lamb chops, steak or prawns on the barbie are perhaps some of our most typical Australian meals. Our warm summer weather and relaxed, laid-back lifestyle mean that entertaining outdoors suits our more casual attitude. So is a barbecue a feature of a distinctive Australian cuisine? Or is it the fact that we have access to high-quality food all year round or our capacity to embrace the food of other cultures that are important factors in the development of an Australian cuisine?

AUSTRALIAN FOOD ICONS

In 2015, *National Geographic* presented what it claimed to be the 'top 10 iconic Australian foods'. Its top 10 list included the pavlova, Chiko Rolls, meat pies, the 1950s Streets Splice ice-cream, lamingtons, Vegemite, the sausage sanger, Weet-bix, Anzac biscuits and neenish tarts!

So where did they come from, why do we love them, and can we describe them as distinctively Australian?

Pavlova

Pavlova is one of our all-time favourite desserts and is still popular today with many home cooks. In the 1920s, an Australian chef, Herbert Sachse, is reputed to have developed the recipe and named it after the Russian ballerina Anna Pavlova during one of her tours to Australia. However, this version is often disputed by New Zealanders, who claim the recipe originated on their shores. While the truth of its origins may never be known, it is still a popular dessert when topped with fresh strawberries or passionfruit – or kiwi fruit if you are a New Zealander! Today, this recipe has many contemporary adaptions, such as the coffee meringue roulade on page 322, or wattleseeds or toasted nuts stirred through the meringue or the filling.



Shutterstock.com/Tanya Sid

The pavlova is a classic Australian dessert.

Anzac biscuits

The Anzac biscuit is another iconic Australian food. This traditional Australian biscuit was created during World War I by the mothers, wives and sisters of soldiers serving overseas and takes its name from the Australian and New Zealand Army Corps. The women created it as a food suitable to be sent overseas, to boost soldiers' morale and sustain them in the trenches. It was originally called a 'soldier's biscuit' and was designed to supplement the diggers' rations. The traditional ingredients of oats, flour, coconut, butter, golden syrup and bicarbonate of soda used to make Anzac biscuits were suitable to withstand the journey to the battlegrounds, which may have taken many months.

In recent years, these biscuits have undergone a revival and are often available, sometimes as very large biscuits, in cafes and coffee shops. Manufacturers such as Arnott's make these biscuits all year round for sale in supermarkets. Before Anzac Day, the biscuits are often sold in special commemorative tins and some of the profits are donated to Legacy, a charity providing services to Australian families suffering financially and socially after the death of a spouse or parent during or after their war service.



Dlibrary

Anzac biscuits are still an Australian favourite.

Lamingtons

Legend has it that Lord Lamington, Governor of Queensland in the late 1800s, created the lamington after a mix-up in the kitchen. Supposedly, a maid, working at Government House in Brisbane, accidently dropped the Governor's favourite sponge cake into some melted chocolate. Not wanting to get his fingers messy or to waste the sponge cake, the Governor suggested she dip the chocolate-covered sponge in coconut. And so the lamington was born; it has become an Australian food icon.

Today, the lamington is often split in half and filled with a thin layer of strawberry jam or cream. Mass-produced lamingtons can be found in most Australian supermarkets and Friday 21 July has been designated as National Lamington Day in Australia!



iStock.com/davidf

Lamingtons are a great way of using leftover sponge cake.

Meat pies

Although meat pies have British origins, they have always been an iconic Australian food. During the opening of the original Parliament House in Canberra in 1927, guests dined on hot meat pies. Aussie meat pies have always been associated with sporting events such as the AFL or rugby league as they are an easy hand-held meal to eat while watching the game.

The traditional pie usually included only the basic ingredients of meat, usually beef, gravy and pastry. Today, the pie reflects more contemporary ingredients and flavours, such as Thai chicken pies, Mexican pies, curry pies and pies with a beef and burgundy filling. Low-fat fillings and pastry have also been designed for the health conscious. Our love of pies is so great that a party or get-together is not complete without party pies!



iStock.com/Robyn Mackenzie

The meat pie is one of Australia's most iconic foods.

CONTEMPORARY USE OF 'BUSH FOODS'

Our native bush foods are some of Australia's most distinctive ingredients. However, they are not ingredients commonly used by most Australian cooks. We might see wattleseed or bush spices on the menu in some of our more contemporary restaurants, but it is unlikely they will be found on most pantry shelves. Kangaroo has, however, become more popular and can now be found in most supermarkets and butchers, often because it is a lean, high-protein food that has a low fat content. The most tender cuts of kangaroo such as kangaroo tail are often stir-fried with Asian flavours or simply grilled so that they are medium rare. Many restaurants in tourist areas include kangaroo on their menus, and in some areas wallaby, emu and crocodile are also served in a range of creative ways.

Wattleseeds, the seeds of a type of Australian acacia tree, have become a popular flavouring for drinks, desserts and ice-cream. The nutty, coffee flavours of the seeds are also suited for dishes such as pancakes.



Wild Hibiscus Flower Company Pty Ltd

Wattleseeds can be used to give a coffee flavour to desserts.



StockFood/Louise Lister

A contemporary Australian dish of seared kangaroo tail

Finger limes are becoming more widely available as an ingredient. They are a cylindrical rainforest fruit that contain tiny, lime-flavoured, individual juice crystals or pearls similar to caviar that are compressed inside the fruit and burst out when eaten.

This fruit has recently become popular for flavouring and garnishing citrus-flavoured tarts and savoury foods such as fish dishes and oysters. These lime-flavoured pearls explode in the mouth; they are also used in the preparation of cocktails to give a burst of citrus flavour.



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Finger limes give a citrusy lime flavour to foods.

A FUSION OF FLAVOURS AND ETHNIC TRADITIONS

One of the distinctive features of Australian cuisine is that it often involves combining completely different **ethnic foods**; that is, foods that originate from different heritages, cultures and traditions. This is known as **fusion food** and involves combining a variety of different cuisines in a single eating experience.

Leo Schofield, in a 1994 edition of *The Age Good Food Guide*, first coined the term 'modern Australian' cuisine. The style he was referring to had previously been known as 'international cookery', but came to be known as 'modern or contemporary Australian' and referred to a collision of cuisines from around the world.

Asian flavours and ingredients, such as lemongrass, coriander and chilli, are now blended into many European dishes. In the same way, locally grown foods, such as barramundi, can be used in the preparation of a Thai green curry. A tandoori-marinated lamb fillet may be served with curried spinach, a roasted pear and saffron polenta – a traditional Australian meat combined with a mix of Indian and European-style ingredients and cooking techniques.



iStock.com/changephoto

Thai red curry with barramundi combines a local Australian fish with Asian flavours.

DEVELOPING A DISCUSSION WEB

A discussion web is a graphic aid that will help you look at both sides of an issue before drawing a conclusion. It helps you organise your thinking, to have a voice in the discussion and to examine the points of view of others and show tolerance for them.

The discussion web uses reading, writing, speaking and listening skills, and requires you to work cooperatively in learning groups or teams, rather than attempting to undertake this task alone.

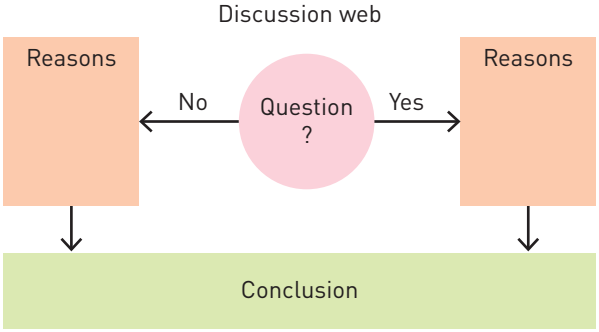
This discussion web provides a structure for critical thinking and helps to examine both sides of a question or issue carefully before making a judgement.

How to develop a discussion web for a debate

1 In pairs, students discuss and draw on the information in this chapter on contemporary foods in Australia and other resources, as well as personal experiences to discuss the topic question. Students need to take a 'yes' or 'no' position and provide evidence for their position. All opinions are acceptable as long as they are supported by evidence. Students record the information from the discussion in a graphic organiser similar to the one that follows. Each pair writes down at least three reasons for answering the question 'yes' and three reasons for answering 'no'.

Yes	Question for debate	**No**
Reasons		Reasons

2 The pairs join together to form a group of four students. The four members of the group share their responses. The group then reaches a consensus on a 'pro' or 'con' point of view. The most common reasons for the 'pro' or 'con' position are then listed on a discussion web form similar to the one below.



3 The group elects a spokesperson to share these points of view with the whole class.

4 Individual students write a personal response to the question or statement to support their opinion.

Activity 8.3

It's up for debate …

1 Prepare a discussion web on the topic, 'Does Australia have its own distinctive cuisine?'
2 Draw your own conclusion about the topic.
3 Write your conclusion in the form of a response on a blog or letter to the editor.
4 Alternatively, hold a class debate on the topic to come to a conclusion about whether Australia has its own distinctive cuisine.

Understanding the text

11 Outline three features of *Cookery the Australian Way* that are popular with people learning to cook.
12 Explain why *The Margaret Fulton Cookbook* and the *Australian Women's Weekly* cookbooks are favourites in many Australian households.
13 Why do many people call Stephanie Alexander's *The Cook's Companion* a 'food bible'?
14 Explain how Neil Perry, Bill Granger or Donna Hay have inspired and influenced Australian cooks.
15 Identify a celebrity chef you have seen on television and briefly describe one recipe they have prepared.
16 Draw a knowledge map to demonstrate some of the factors influencing the cuisine of Australia. List one additional factor not listed in the text that you think influences the type of food we eat.
17 Select one of Australia's 'food icons' and comment on why you think it is a firm favourite with many Australians.
18 Name two 'bush foods' you know of and give one example of how they can be used in contemporary Australian cuisine.
19 Search the recipes in *Food Solutions*, both at the end of the book and online, and list examples of three recipes that demonstrate the contemporary use of fusion flavours.
20 Explain why a discussion web is a useful tool in developing arguments for a debate.

THINKING SKILLS

Develop a digital collage to reflect a current food trend or food subculture in Australia. Annotations should be used to highlight key features of your chosen topic.

CURRENT TRENDS AND ISSUES IN AUSTRALIA

CONSUMER DEMAND FOR CONVENIENT FOODS

Growth in the local production and importation of frozen meals that are easy to prepare



POPULATION GROWTH

24 million in 2016 to 40 million in 2050



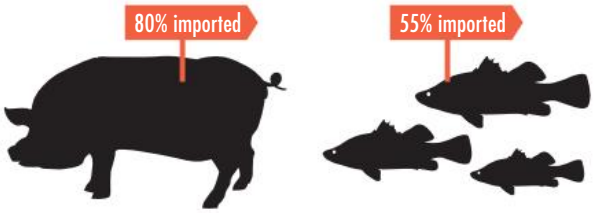
INCREASING GLOBAL DEMAND

China's annual meat consumption was **4 kg** per person in **1966**; today it is **54 kg**.



EXPORTS AND IMPORTS

Rise in imports



Increasingly complex free trade agreements



Export demand for 'clean green food' produced in Australia



RETAILERS

Increasing popularity of discount supermarkets



Aldi market share:
0% in **2001**
10.3% in **2015**
across Victoria, New South Wales and Queensland

Rise in private label products



21% of packaged grocery goods are now private labels.

9

AUSTRALIAN FOOD INDUSTRY TRENDS AND ISSUES

PRIMARY PRODUCERS

INCREASED EXPORT



60% of crop and livestock is currently exported.

DROUGHT



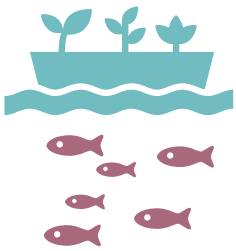
Sheep and beef production in Qld and NSW declined in 2015 as a result of drought in northern Australia.

GROWTH OF GENETICALLY MODIFIED CROPS



22% of the national canola crop is now GM.

GROWTH OF AQUACULTURE



43% of Australia's total fisheries production is now through aquaculture (fish farms).

GROWTH OF ORGANIC FOOD PRODUCTION



15% growth of organic farming since 2015.

INCREASING FOREIGN OWNERSHIP OF AGRICULTURAL LAND



The largest cotton-growing property in Australia was sold to Chinese investors in 2013.

KEY TERMS

Agricultural sectors in Australia include grains, oilseeds, sugar, dairy, livestock and fisheries production.

Biosecurity protocols are agreements with other nations, developed to minimise any risks to Australia's agricultural and livestock production.

Casein is the protein in milk.

Coal seam gas is natural gas (methane) that is found in underground coal formations or coal seams where water pressure keeps it contained.

Large-scale cropping is a highly mechanised production system that uses the latest technological advances in food production.

Private label products are products that a supermarket sells under its own company name.

Whey is the residue after milk has been processed.

COMPONENTS OF THE AUSTRALIAN FOOD SYSTEM

FOOD PRODUCTION

PRIMARY PRODUCTION

- Agriculture, horticulture, fisheries
- A wide range of crops and animals are produced for human consumption





FOOD PROCESSING

- Secondary processing to produce a range of food products
- Packaging of processed food for distribution and sale



FOOD DISTRIBUTION

RETAIL SALES AND DISTRIBUTION

- Fresh food markets
- Supermarkets
- Farmers' markets
- Convenience stores
- Small local stores





FOOD CONSUMPTION

FOOD SERVICE

- Cafes, restaurants, fast food outlets
- Hospitals, nursing homes, school canteens

MEALS AT HOME

- Meals prepared and eaten at home



Components of the Australian food system

A food system is the path that food travels from 'paddock to plate'; that is food's journey from the farm, its movement to food processors, to the food retailers or other areas of the food service sector and finally onto the consumer's plate. The food is transported between all stages of the food system using refrigerated trucks and complex logistics to ensure it moves quickly and remains fresh and safe to eat.

Many primary and secondary food producers export their produce to overseas markets. This produce includes much of our dairy, beef, lamb and grain produce as well as a range of processed food products.

Each stage of the food system affects the environment, whether through the use of water, the depletion of nutrients in the soil or the use of fossil fuels to produce much of the energy used throughout the system. The production, distribution, service and consumption of food also create solid and liquid waste that must be disposed of, and greenhouse gas emissions that contribute to global warming and climate change.

Current economic trends, issues and influences in the Australian food industry

Primary food production and the food manufacturing industry are an important component of the Australian economy, and in 2014 were worth more than $114 billion. According to data released by the Australian Food and Grocery Council, Australia's food and beverage processing grew by 2.8 per cent, and exports increased by 13.5 per cent, in the period 2013–14.

This sector also makes a significant financial contribution to the Australian economy through the employment opportunities it provides. While Australian industry makes a broad range of products, food and beverage processing continues to be Australia's largest manufacturing industry.

TRENDS AND ISSUES FOR THE AUSTRALIAN FOOD INDUSTRY TO 2050

A recent report titled *Consumption Patterns and Food Demand in Australia to 2050* by research analyst Jack Di Nunzio outlined a number of issues facing the Australian food industry. The report highlights the fact that, while Australia is currently food secure, the nation may become more vulnerable as we move towards 2050 as a result of a range of factors, including population growth, the impact of global competitiveness and climate change.

Population growth

One of the most important issues identified in the report is that Australia's population is expected to reach approximately 40 million by 2050. The population will be older and more ethnically diverse, and most people will have a higher average income. This will put pressure on agricultural sectors to provide an adequate food supply for the local population while simultaneously trying to meet the demand from export markets.

Consumer demand

The report also notes that as Australia's population is largely confined to our large cities and regional centres, this is leading to a demand for more convenient processed foods that suit the 'time-poor' lifestyle of city dwellers. This trend could see a growth in the local production and importation of frozen meals that are easy to prepare.

Increasing global demand

Di Nunzio's report also notes that the increasing affluence of world populations has led to an increase in the demand for protein, dairy and wheat products. China, in particular, has seen a surge in the consumption of meat, and the Chinese now consume approximately 54 kilograms of meat per person per year, up from 4 kilograms 50 years ago. This trend will put pressure on Australian cattle producers to keep pace with the requirements of the local industry as well as the demand from the international market.

ECONOMIC TRENDS AND ISSUES FOR AUSTRALIAN FARMS AND FISHERIES

Historically, agricultural production has played an important role in the Australian economy. However, over the last few decades this influence has begun to decline and now our agricultural sector contributes just 2.3 per cent to Australia's gross domestic product. While in the past Australia's agricultural production was used solely to supply food for the local population, this is no longer the case. Increasingly, our agricultural production is an export commodity and Australia



Getty Images/Mangiwau

Drought has a major impact on livestock production.

currently exports more that 60 per cent of our crop and livestock production.

Agricultural production grew steadily during the early part of the century, but has slowed to 1 per cent per annum in more recent times. Sheep and beef production in Queensland and northern New South Wales declined during 2015 as a result of drought conditions in northern Australia. This has led to large falls in the income of many livestock producers in these regions. Similarly, low rainfall in parts of Victoria had an impact on sheep numbers, which has reduced farm incomes in the state. Beef and grain production have also declined over the past few years as a result of drought conditions.

GM canola in Australia

The production of genetically modified canola began in New South Wales and Victoria in 2009, and in Western Australia in 2010. Since then the production of herbicide-resistant GM canola has grown and now represents 22 per cent of the national canola crop. A study by the University of Melbourne has shown that GM canola can be grown in drier conditions and that significantly less herbicide would be required in its production.

A survey of members of the Birchip Cropping Group by the Grains Research and Development Corporation showed that farmers in the Birchip region felt that the use of GM canola had significant environmental benefits. These benefits include a reduction in the cultivation of their soil and in the amount of high-risk herbicides they used on their farms, as well as a 16 per cent reduction in the amount of diesel they used on their farms.

Fisheries production in Australia

One of the key trends in fisheries production is the move to aquaculture production. This trend has seen a 12 per cent increase in fish and seafood produced by sustainable fishing methods such as aquaculture, and it now represents 43 per cent of total fisheries production.

Japan has become a leading importer of Australian salmon for use in the production of sushi. This has led to a significant increase in salmon produced in Tasmanian aquaculture systems.

Organic food production

Australian consumers have shown a great appetite for organic food products and this area of agricultural production has shown remarkable growth over the past decade. According to the Australian Organic Market Report, the value of the Australian certified organic industry is estimated to be approximately $2 billion. This represents a growth of approximately 15 per cent over the decade and organic food production is predicted to show even stronger growth over the next 5 to 10 years.

Australian exports of organic produce have also grown strongly over the same period and this trend is expected to continue. Australia's main export markets for its organic produce are North America, Europe, Singapore, Malaysia, Hong Kong and Japan.



Getty Images/Bloomberg

Organic pig meat is becoming more popular with consumers.

Foreign ownership of agricultural land

The sale of some of Australia's key pastoral and agricultural land to foreign owners in the past few years has led to considerable debate within the Australian community. In 2016, the federal government rejected the sale of Australia's largest landholding, S Kidman and Co, to a Chinese conglomerate. The property is enormous – apparently almost half the size of Victoria – and includes 10 cattle stations located across three states. The sale of this property to overseas interests was not approved as it was considered to be contrary to the national interests. The sale of Cubby Station to a giant Chinese textile company in 2013 also raised concerns for many people in the industry. Not only is Cubby Station a vast property, the Chinese company that bought it also bought the extensive water rights held by the company. Cubby Station is the largest cotton-growing property in Australia and operates the largest irrigation system in the Southern Hemisphere.

The sale of these prime agricultural properties to overseas investors has led some people to question the ability of Australia to maintain control over our limited water supply and the food we produce. However, other people welcome the entry of foreign investment into the agricultural sector, believing it will provide an economic boost to the industry.

TRENDS AND ISSUES FOR AUSTRALIAN RETAIL FOOD AND BEVERAGE SALES

The Australian supermarket industry is worth approximately $90 billion annually and therefore makes a significant contribution to the Australian economy. Between 2011 and 2016, this sector showed an annual growth rate of 3.8 per cent.

The Australian supermarket sector is fiercely competitive. Currently the industry is controlled by supermarket giants Coles, Woolworths and Metcash. Metcash operates a large number of independent stores, including IGA and Foodland. The three supermarket giants operate stores in cities and suburbs across the nation. However, this stranglehold on the sale of supermarket products has been reduced by the introduction of new companies including Aldi and Costco. Aldi opened its first store in Australia in 2001 and now has more than 400 stores operating throughout the eastern seaboard states. Costco is another new player in the supermarket scene and currently operates seven warehouses nationally.

An increase in apartment dwelling, particularly in the central business districts of our capital cities, has led to the opening of express-style supermarkets in or close to the CBDs. Research suggests that the number of smaller concept stores will continue to increase in the future.

Consumer trend to discount supermarket shopping

Choice magazine's Consumer Pulse Survey, completed in March 2015, showed that more than 75 per cent of Australian consumers were concerned about the high price of their weekly shopping bill and were looking for ways to reduce their spending. Increasing prices have forced consumers to search for similar products sold

at lower prices, and products that give value for money. This has led a large number of consumers to purchase **private label products** – products that a supermarket sells under its own company name – and to do much of their weekly shopping in low-cost, discount or 'no frills' supermarkets such as Aldi.

Since Aldi entered the Australian supermarket scene it has opened stores across the nation and now claims 11 per cent of market share in the eastern states. Aldi provides a limited array of products and operates from small, low-cost premises that require fewer staff. This strategy has allowed Aldi to offer significantly lower prices, which appeals to people who have a limited food budget. In recent years, Aldi has opened a large number of stores throughout the eastern states. It also intends to open additional stores in South Australia and Western Australia in the near future.

This trend for many consumers to do more of their weekly shopping in discount supermarkets like Aldi seems set to continue with another German supermarket chain, Lidl, looking to open in Australia.

Activity 9.1

Another German supermarket chain entering the Australian market

Read the article then answer the questions below.



Shutterstock.com/Darios

Lidl's logo

1. Why would Lidl be considering opening in Australia?
2. What are the main features of Lidl supermarkets?
3. Where does Lidl source the products sold in its stores?
4. What benefit would there be for consumers if Lidl were to open in Australia?

ANOTHER GERMAN SUPERMARKET CHAIN AIMS FOR QUICK AUSTRALIAN ENTRY

German discount supermarket chain Lidl looks like it is making solid moves to enter the Australian market.

Lidl is currently in the process of reserving the rights to several product names and is looking at its Australian logistics options according to unnamed corporate and supply chain sources.

No official announcements have been made by the supermarket itself.

The story to date: Lidl

Lidl had its start in 1930 and is often compared to fellow German chain Aldi.

The supermarket has a large presence in Europe and was named last year by Deloitte as the fourth largest retailer in the world. It was recently named Grocer of the Year at the Grocer's Gold Awards in London.

Lidl is privately owned and has 9800 stores across 28 European countries. Australia would be one of the first countries Lidl operates in outside Europe. The supermarket is expected to open in Lithuania and Serbia this year and is rumoured to be opening in the US by 2018, followed by plans to enter Russia.

The chain opened in the UK in 1994 and has a 5 per cent share of the country's supermarket industry.

Relationship to Aldi

Lidl is very similar to Aldi in many aspects, especially store appearance. The chain displays stock on pallets so they can be moved in quickly. Non-food items are sold, plenty of in-house brands are on offer and only a small handful of staff work at each store in order to cut expenditure.

Since 2012, all Lidl stores have had bakeries that make and sell fresh-baked products. Lidl also sources locally made products in all of its markets, including house [private label] brands. Is Lidl a threat to the Australian supermarket industry?

Aldi's move into Australia was a big game changer and the supermarket chain is currently reputed to have 10.3 per cent of the market share on the east coast. Aldi is now in the process of expanding into South Australia and Western Australia.

There is a big chance Lidl will come in and take a significant slice out of the Australian supermarket pie. Competition wars are sure to heat up further as a result.

Andrea Hogan, *Australian Food News*, 15 June 2015 (adapted)

Rise in private label products

One of the key trends in the supermarket sector over the past decade has been a rise in the sale of private label products. These products now make up 21 per cent of the sale of packaged grocery products. In 2014, at Coles, Woolworths and Aldi, the sale of these products rose by 6.6 per cent. Much of the increase in the sale of private label products is a result of an improvement in the quality and presentation of these products.



Private label products are popular with shoppers.

Global food and beverage trends

A report by Mintel, a global market research company, titled *Global Food and Drink Trends 2016*, identified the following consumer-driven food trends:

- increased demand for vegetarian alternatives in the mainstream population
- demand for products that are 'natural', have undergone little processing and contain few artificial ingredients
- demand for food producers to demonstrate environmentally sustainable food production practices
- greater demand for single-serve meal portions to accommodate the increasing number of people who live in single-person households
- better understanding of the importance of 'good' fats in the diet and a reduced concern with avoiding all forms of fat
- more sharing of pictures and stories about food on platforms such as Instagram and Facebook
- more pre-prepared packaged food that is visually appealing, with bright, bold colours that will encourage consumers to share these new products on social media posts
- a desire for foods that match the consumer's personal physiology and current exercise program.

TRENDS AND ISSUES FOR FOOD EXPORTS AND IMPORTS

Australia has a strong history of sending much of its primary produce to overseas markets, and currently we export approximately 60 per cent of the food we produce. Japan, South Korea, the United States of America, China and Indonesia are some of our major export partners. Unprocessed grains, wheat, beef, sheep and dairy products are our key export commodities to these countries. There is also a trend for niche market products to be exported as high-value products. These include saffron, truffles and wasabi, all of which have only recently started to be grown in Tasmania and Victoria.

The Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) predicts that the value of our agricultural exports will increase by 11 per cent by 2018–19.



Alamy Stock Photo/Bruce Miller

Growing saffron in Tasmania

Research analyst Jack Di Nunzio, in his report *Australia's Food Export Outlook*, states that the main markets for Australia's food exports into the future will be China and Indonesia. There will be a high demand for our broadacre crops such as wheat, barley, canola and sugar as consumption of these products increases in Asia. Beef and sheep exports are also predicted to rise as demand for these foods increases.

Free trade agreements

One of the most important issues facing the Australian agricultural sector is its ability to access overseas markets. During 2014 and 2015, Australia signed a number of free trade agreements with other countries including Japan, Korea, and the Trans-Pacific Partnership countries. In December 2015, Australia signed the China–Australia Free Trade Agreement. This agreement is seen as one of the most important for Australia because China is Australia's largest export market and accounts for nearly one-third of our total exports.

The signing of these agreements has the potential for farmers and livestock producers to significantly increase the amount of produce they export to these countries by removing import tariffs that have previously been applied. This will free up more markets and will lead to increased demand for the high-quality products the Australian farming community produces.

Demand for 'clean green food'

One of the key reasons for the rise in our export market is the 'clean green' reputation of Australia's agricultural and food production industry. Overseas customers realise that they are guaranteed to receive clean, safe food, making Australia a desirable market from which to import food. Overseas customers are also guaranteed of the providence of food they import based on the high standards required by our food safety regulators, Food Standards Australia New Zealand (FSANZ).

Australian cherries, crayfish and abalone are some of the products that are highly sought-after in Japan and China. More recently, there has been exceptionally high demand for Australian baby formula from China, which has led to some shortages in the local market.



Cherry Growers Australia Inc.

China has become a key destination for Australian-grown cherries.

Food imports into Australia

The percentage of food imported into Australia has been steadily increasing over the past decade. Much of this increase is of processed fruit and vegetables from New Zealand, and European countries such as Italy and France and from the United States.

One of the key factors leading to a rise in imports of processed food was the long period of drought that meant that local producers could not fulfil their supply contracts. This led the food processors and the major supermarket chains to find overseas companies that could fill the gap in the market.

Another factor leading to the rise in imported food has been a strong Australian dollar, which has meant that products produced overseas are often cheaper than similar products produced locally.

Of concern to pork producers in Australia is the steep rise in the amount of processed meat, particularly pork products, that are now imported into Australia. Approximately 80 per cent of the ham, bacon and smallgoods consumed by Australians is produced from imported pig meat.

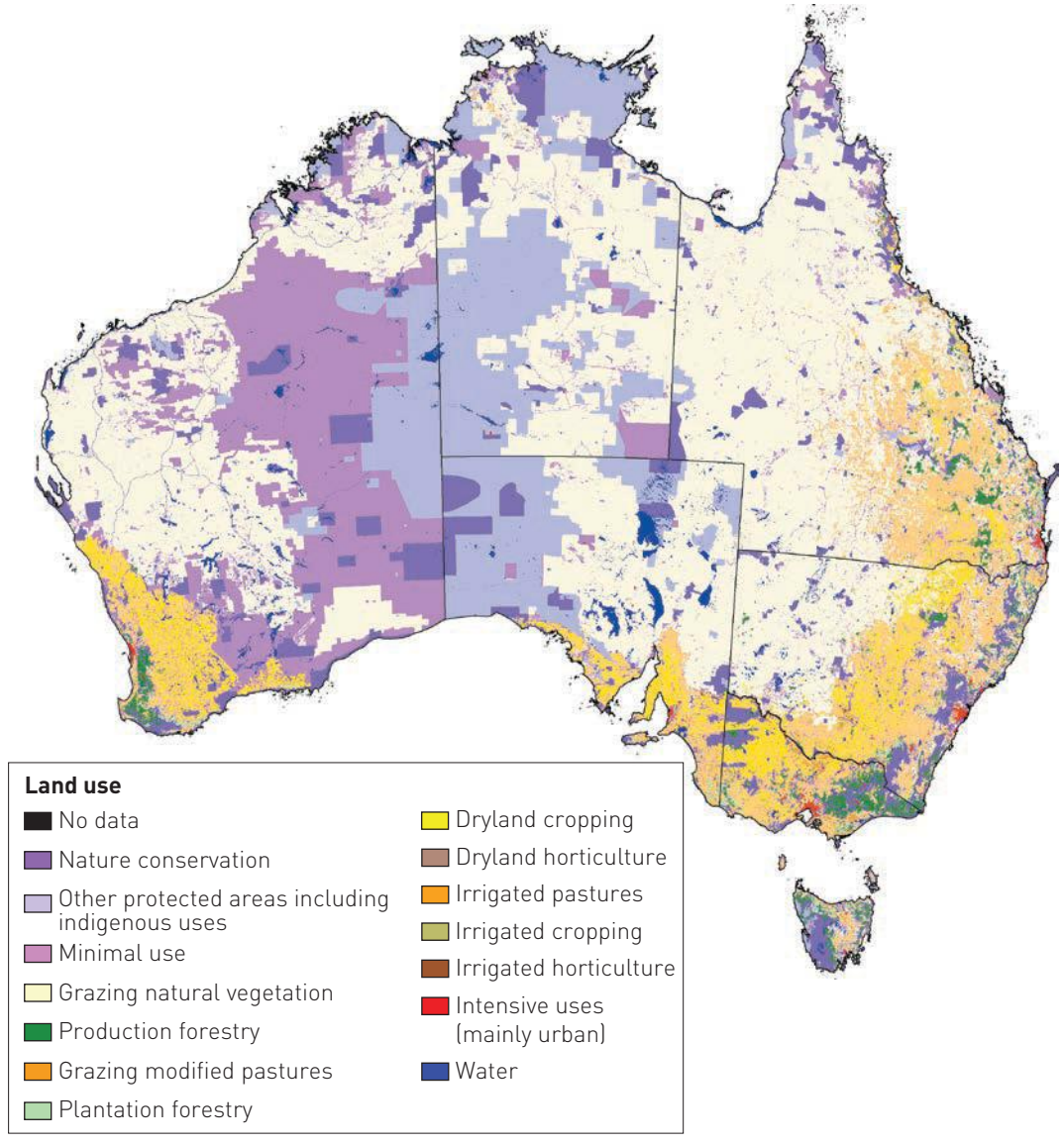
Imports of seafood from Vietnam, China and Thailand have also risen sharply and now make up approximately 55 per cent of the seafood consumed locally.

Understanding the text

1. Why are primary food production and the food manufacturing industry considered to be important to the economy of Australia?
2. Draw a knowledge map to outline the key issues facing the Australian food industry to 2050.
3. Outline the main factors that led to a decline in the income of sheep farmers in Queensland, northern New South Wales and Victoria in 2015.
4. Describe the environmental benefits that members of the Birchip Cropping Group have identified following the introduction of GM canola.
5. Outline the recent trend in organic food production in Australia.
6. Describe three of the latest trends in the Australian supermarket sector.
7. What are the main factors driving consumers towards discount food shopping and private label products?
8. Draw a knowledge map to demonstrate six key food and beverage trends for 2016.
9. How have the signing of free trade agreements with overseas countries and the demand for 'clean green food' increased the export of Australian food commodities?
10. Explain one of the key reasons there has been a rise in the amount of food imported into Australia.

Primary food production in Australia

Australia is considered to be one of the world's most food secure nations. We produce a wide range of fresh, high-quality food to feed our population. According to data released by the Prime Minister's Science, Engineering and Innovation Council (2010), Australia produces sufficient food today to feed approximately 60 million people. Our **agricultural sectors** include grains, oilseeds, sugar, dairy, livestock and fisheries production.

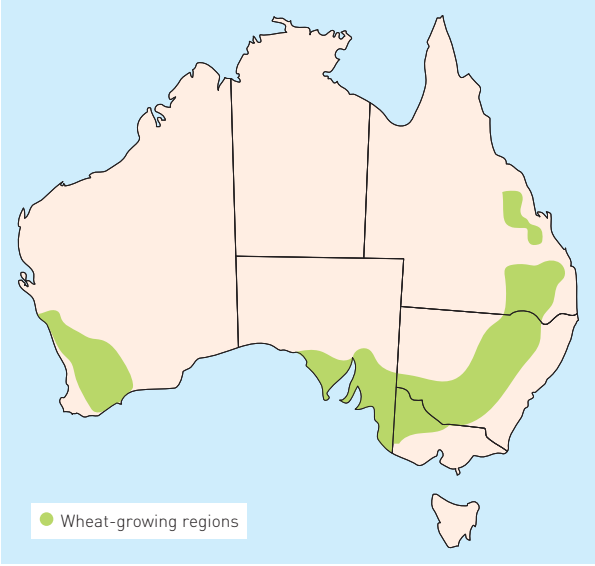


Land use in Australia

LARGE-SCALE CROPPING

Food crops in Australia, including wheat, barley, canola, oats, chickpeas, lentils, broad beans, sugar cane and rice, are produced using large-scale broadacre cropping operations. **Large-scale cropping** is a highly mechanised production system that uses the latest technological advances in food production. Large-scale machinery, including computer-operated systems and GPS tracking, are used to prepare the seedbed and to sow and harvest the crops.

Wheat is Australia's most valuable crop in terms of both the greatest production and the area of land under cultivation. Wheat is a winter crop and is grown in a region called the 'wheat belt', which includes parts of Western Australia, New South Wales, South Australia, Victoria and Queensland. Australia exports the vast majority of wheat produced to Asia and the Middle East.



Wheat-growing regions of Australia



iStock.com/lonewolfshome

Wheat is grown as a broadacre crop.

Canola production has grown significantly in Australia over the past decade; it is now our major oilseed crop and one of our largest broadacre crops. Canola growing takes place in a similar region to that of wheat production across south-eastern Australia and in parts of Western Australia. Australia is the world's second largest exporter of canola seed, with international markets including Japan, China, Pakistan, Europe and Bangladesh.

Other oilseed crops grown in Australia are safflower and linseed.

Rice growing in Australia is concentrated in the Murrumbidgee valley and Murray valley in southern New South Wales. Small areas of rice are also grown in the north-eastern region of Victoria. These areas provide a reliable source of irrigated water, which is essential for rice production. Approximately 80 per cent of the rice grown in Australia is a medium-grain rice. Australia exports about 80 per cent of its rice crop to countries in the Middle East, North America and Asia.



iStock.com/keiichihiki

Canola is grown as a broadacre crop.

Sugar cane grows in a tropical climate; in Australia 95 per cent of sugar cane is produced in Queensland and only 5 per cent in northern New South Wales. Australia exports more than 80 per cent of the raw sugar produced to Asian markets, including South Korea, Indonesia, Japan and Malaysia.

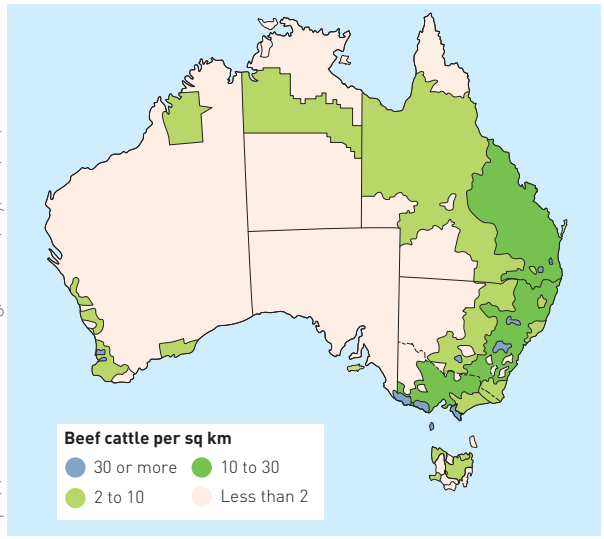
THE LIVESTOCK INDUSTRY

Australia produces a range of livestock for human consumption, including beef, sheep, pigs, goats and poultry, and livestock is one of our most valuable agricultural sectors. More than 90 per cent of the fresh meat sold in Australian markets and supermarkets is domestically produced.

Beef production

According to data provided by ABARES, beef and veal production continue to be two of Australia's most important agricultural commodities. In 2014–15, the value of beef production in Australia was estimated at $11.4 billion. Drought across northern Australia in 2013–14 had a significant impact on the industry and many livestock producers were forced to cull much of their herd. During 2016–17, farmers expect to begin rebuilding their herd size and to increase production of meat for the domestic and international market.

Australia exports beef to the United States, Japan, Korea, China, the Middle East, Indonesia and Canada, which provided approximately $5.8 billion in export value in 2015.



Source: Australian Bureau of Statistics, 2000–01 Agricultural Census data. S14.1 Beef Cattle, Distribution – 30 June 2001. Creative Commons Attribution 2.5 Australia https://creativecommons.org/licenses/by/2.5/au/

Beef-producing regions of Australia

Sheep-meat production

The sheep-meat industry is also an important component of the Australian agricultural sector, adding $3.2 billion in value to the economy. The prime regions for lamb production in Australia are the Riverina, the Murray region of New South Wales, and regions of high rainfall in both Victoria and South Australia.

Australia exports approximately 56 per cent of lamb production and 95 per cent of the mutton produced. Australia exports live sheep to the Middle East, including the United Arab Emirates, Kuwait, Bahrain and Jordan.



iStock.com/Nicola Stratford

Australian lambs raised for meat

Pork- and goat-meat production

Australia also produces high-quality pig meat and goat meat for both the domestic and the international markets. Pig meat is used as fresh meat as well as being used in the production of processed products including bacon, ham and smallgoods.

Although a relatively small component of the meat and livestock industry, goat meat is gaining in popularity in Australia. Australia exports goat meat to the United States, Taiwan, Korea and Canada.

Poultry and egg production

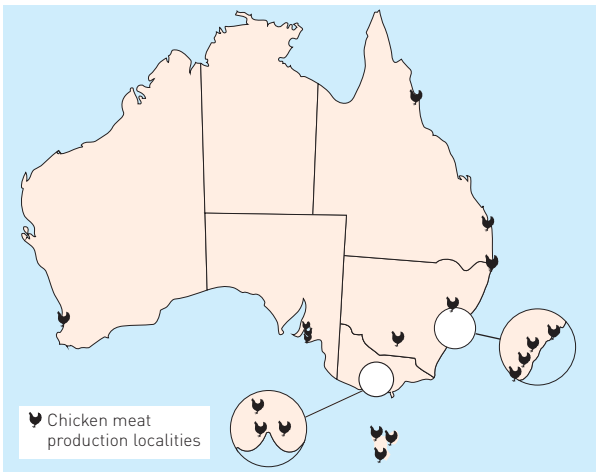
Poultry production is an important component of Australia's agricultural sector and has shown significant growth over the past 50 years. In the past 20 years, the production of chicken meat has increased more than 160 per cent. According to data released by the Australian Chicken Meat Federation, Australian consumers spend approximately $5.6 billion annually on chicken products purchased through the supermarket sector as well as in fast-food outlets and restaurants.

Poultry is produced in regional centres in all Australian states and chicken hatcheries and farms are located within a short distance of the major poultry processing plants.

Chicken meat is considered to be an economical option for many consumers who see it as a staple food in their diet. A wide range of chicken products is available – fresh or frozen raw chicken meat, cooked rotisserie chicken or any number of pre-prepared chicken meal solutions.

Australia consumes approximately 95 per cent of all chicken meat produced, leaving only 4 per cent available for export. Our main export market for frozen chicken cuts and edible offal – such as chicken livers and kidneys – are South Africa, Hong Kong, the Philippines, Papua New Guinea and Vietnam.

Australian consumers are also able to purchase a variety of other types of poultry, including turkey, duck, quail and goose.



Source: Australian Chicken Meat Federation, www.chicken.org.au

Chicken-meat producing regions of Australia

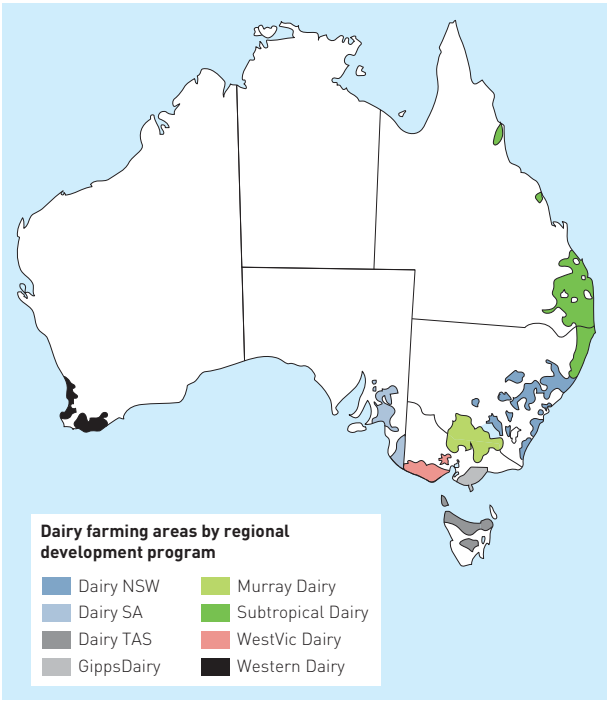
Egg production, like poultry-meat production, takes place throughout Australia. Eggs are a staple product in the diet of many Australians, and consumers purchase approximately $800 million worth of eggs annually. The egg market has seen a significant move away from cage-egg production towards free-range eggs and this segment now makes up approximately 40 per cent of all the eggs sold in Australia. This trend towards the purchase of free-range eggs is driven by consumers' concern about animal welfare issues and the decision by major supermarket chains to start selling cage-free eggs.

THE AUSTRALIAN DAIRY INDUSTRY

The dairy industry is the third-largest agricultural industry in Australia. It has a total value of approximately $13 billion, encompassing farming, dairy processing and the export trade.

The dairy industry is spread across eight regions throughout Australia, including Gippsland, Western Victoria, the Murray region, and Tasmania, New South Wales, southern Queensland, South Australia and the southern regions of Western Australia.

Although Australia is a relatively small dairy food producer on the world stage, it is one of the world's largest exporters. Major importers of Australian dairy products are Japan, Singapore, China, Indonesia and Malaysia. In the domestic market drinking milk is the most popular product, followed by cheese, yoghurt and butter.



Source: Dairy Australia

Dairy farming areas in Australia

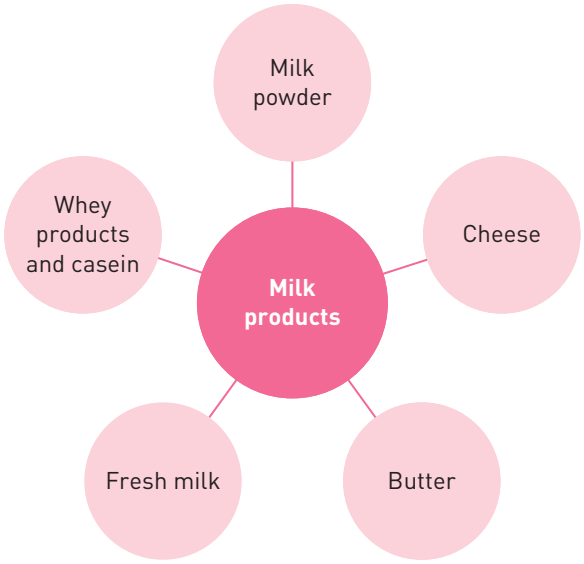


Shutterstock.com/Phillip Minnis

Australian dairy cows

Dairy products

Fresh milk consumption in Australia is increasing and the demand for full-cream milk is shifting to modified milks such as low-fat milks. The fresh-milk market is dominated by National Foods and Parmalat, as well as a number of small processors. Fifty per cent of the milk sold today is sold through supermarkets, mainly as a result of the strong growth in private label brands. Because of milk's short shelf life, exports are mainly limited to UHT milk.



Milk products

The production of butter has decreased slightly in recent years with rising consumer health concerns. Australia exports butter to Egypt, Singapore, South Korea and Morocco.

Cheese is a major product of the Australian dairy industry for both domestic sales and export. In recent years, there has been a move away from firm cheeses, such as cheddar, towards soft cheeses such as brie, camembert and feta. Japan is the most important export market, consuming approximately 50.5 per cent of total exports. Other export markets include China, South Korea, Saudi Arabia and Taiwan.

Australia produces a range of milk powders such as whole- and skim-milk powder. Eighty per cent of the powders are exported and the remainder used locally as a food ingredient.

Whey is the residue after milk has been processed and **casein** is the protein in milk. Whey powder is used to make ice-cream and in beverages, and casein is used in the production of confectionary, biscuits and protein drinks. The domestic market uses 30 per cent of the whey produced and the remainder is exported to China, Singapore, Indonesia and Japan.

FISHERIES PRODUCTION IN AUSTRALIA

Australian consumers have a great appetite for seafood and this has led to an increase in the value of the fisheries industry to almost $3 billion. This trend to increased fish consumption has seen seafood outstrip lamb as a choice for a main meal!

Australia harvests more than 600 varieties of fresh and saltwater species for local consumption and sale to export markets. Atlantic salmon, prawns, barramundi, blue grenadier and snapper are among the most popular types of fish for Australian consumers. Gummy shark, one of Australia's most popular finned fish species, is caught off the coast of New South Wales, Victoria, Tasmania, South Australia and the southern half of Western Australia. Wild-caught fish still accounts for the majority of the seafood produced in Australia.

Aquaculture production, or fish farming, in Australia is a growing sector of the fishing industry and now supplies 43 per cent of the total fisheries production. The major states for aquaculture are Tasmania, South Australia and Western Australia. Farmed salmon is the most popular type of fish produced by this method, followed by tuna and oysters.

Australia exports fresh abalone and rock lobster to Japan, China and Hong Kong.



Alamy Stock Photo/WorldFoto

Tasmanian Atlantic salmon is produced in aquaculture ponds.

HORTICULTURAL PRODUCTION IN AUSTRALIA

Australia has an extensive horticultural industry, which includes fruit, vegetable and nut production. Small farmers make up the majority of the horticultural industry; however, this is beginning to change and, as the cost of production increases, there is a move to more medium- to large-scale operations. The horticultural industry is mainly confined to the eastern states, Tasmania and South Australia, with limited production in the south-west of Western Australia.



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A Queensland pineapple plantation

Tropical fruit, including bananas, pineapple, mangoes and melons, are grown along the coastal strip of New South Wales and Queensland. Oranges, stone fruit and grapes are predominately grown in New South Wales. Victoria produces a large proportion of the nation's apples and pears as well as fruit and

tomatoes for processing. Strawberries, raspberries and blueberries are grown in Queensland, New South Wales, Victoria, Tasmania and Western Australia. A variety of apples is grown in all states. Australia produces more potatoes than any other vegetable, and Tasmania produces much of the nation's processing potatoes. Tomatoes are also an important vegetable product. Victoria grows the majority of tomatoes for processing while the majority of tomatoes for the fresh market come from Queensland, with smaller volumes produced in all other states. Carrots, onions, mushrooms and salad greens are all produced throughout the country.



Alamy Stock Photo/Stephanie Jackson

Leafy salad vegetables growing in Gippsland, Victoria

Nuts, including almonds, chestnuts, hazelnuts, pistachios, macadamias, pecans and cashews, are grown in Victoria, Queensland and Western Australia.

Factors that protect or threaten the quality of the food we grow

Australia is considered to have a very safe and secure food supply. Our farmers produce a wide range of food products, which means we not only produce enough food to feed our own population, but we can also export a large proportion of our agricultural and horticultural products to other countries. Australia has a number of systems in place to protect the quality of our food supply, such as a rigorous biosecurity system. However, there are some factors that loom as potential threats to our ability to remain food secure.

PROTECTING AUSTRALIA'S FOOD SUPPLY

Australia is an island nation and, in the past, our island status has protected us from many of the pests and diseases that threatened the food supply of other nations. However, the dramatic increase in international trade and the large number of tourists who visit Australia mean that there is an increased risk that some of these harmful plant and animal diseases may find their way into Australia.

Biosecurity

Australia, through the Department of Agriculture and Water Resources has a series of strong **biosecurity protocols** in place (agreements with other nations) to minimise any risks to Australia's agricultural and livestock production. Biosecurity staff use trained detector dogs, X-ray machines and surveillance strategies to inspect goods as they arrive at Australian airports, seaports and mail centres. This system is designed to prevent any exotic diseases, such as



Biosecurity and Regulation Department of Agriculture and Food, Western Australia

State quarantine 'Bin it' poster

foot-and-mouth disease, from entering the country and adversely affecting local sheep and cattle industries. These biosecurity measures have also prevented diseases such as fire blight, a plant disease that could decimate Australia's apple and pear industry, from entering the country.

Australia also has a series of domestic quarantine rules that restrict the plant and animal matter that can be taken from one state to another. Phylloxera, an insect pest that can infect grapevines, and fruit fly are examples of two pests that are controlled by state quarantine restrictions. 'Eat it or bin it' is a quarantine program enforced by the Department of Agriculture and Food's Quarantine WA service, which asks travellers to dispose of any fresh fruit or vegetables before they enter Western Australia.

Use of biotechnology

The Department of Agriculture and Water Resources has identified the use of biotechnology as important in protecting Australia's food supply into the future. Many plant scientists believe that the use of genetically modified plants will enable Australian farmers to address some of the key concerns associated with climate change. As the climate changes and becomes hotter and drier, many of the crops that we presently grow will struggle to remain viable and maintain their current yield.

The website of the Office of the Gene Technology Regulator lists a number of small field trial sites throughout Australia for genetically modified crops including wheat, sugar cane and safflower. The trials of genetically modified wheat are being used to determine its tolerance to higher temperatures and to genetically modified varieties that might improve crop yields. Other countries are trialling GM wheat to determine its resistance to salinity and some wheat fungi and viruses.

THREATS TO THE QUALITY OF THE FOOD WE GROW

Australian farmers face a number of threats in their ability to continue producing the high-quality food we are so accustomed to eating. Climate change, overseas ownership of our prime agricultural land, the spread of our cities into rural areas, cheap food imports and coal seam gas have all been identified as potential threats to the future viability of our agricultural and horticultural industries.

Climate change

Possibly the greatest threat to the quality of the food we produce is a changing climate. The Australian Academy of Science defines climate change as being 'a change in the pattern of weather, and related changes in oceans, land surfaces and ice sheets, occurring over time scales of decades or longer'.

Evidence clearly shows that a changing climate will have a significant impact on agricultural conditions across Australia and will therefore impact on the quality of our food supply. As our climate is changing, it is influencing both the intensity and duration of rainfall. A diminishing water supply in our most important food-producing regions such as the Murray–Darling Basin will mean less water available for irrigation. This will impact on beef, grain and dairy production in particular.

As the temperature rises across the country, moisture levels in the soil will decline, making it difficult to grow crops, which will result in significantly reduced yields in the years to come. Berry crops may no longer be able to survive in the hotter conditions that will prevail in Queensland and New South Wales, and may be pushed further south to Victoria or Tasmania. Higher temperatures may also cause vegetables to be grown in cooler climates or under shade houses to protect them from sun and windburn.

Increasing urbanisation

Another major threat to the security of our food supply and the quality of the food we grow is that our major cities are now spreading into nearby rural areas. Today, many of our most productive horticultural areas on the fringes of our major cities have been subdivided into housing estates. It has been estimated that this urban sprawl now threatens approximately 70 per cent of our fresh vegetable production. Areas such as Werribee and Cranbourne on Melbourne's fringe have rich, fertile soils that have produced a range of high-quality vegetables and fruit for the past century. Finding suitable alternative land and developing the necessary farm and transport infrastructure may prove a significant challenge and could threaten the quality of the food we grow.

Coal seam gas

Many people in Australia's farming community are concerned about the increase in the production of coal seam gas and the potential impact it may have on the viability of their farm. **Coal seam gas** is natural gas (methane) that is found in underground coal formations or coal seams where it is contained by the pressure applied by water. To extract the gas, the water is pumped out of the coal seam. This releases the pressure in the coal seam and allows the gas to be extracted.

Farmers, particularly in the eastern states where the growth in coal seam gas has been concentrated, are concerned that the extraction of coal seam gas will draw water out of subterranean ground water supplies and limit the water available for farming. For many farmers, groundwater provides their only reliable source of water and many are concerned that as the methane is extracted, it may not only limit the amount of water available, but could contaminate the water supply.

Another concern of farmers is that they do not have the legal right to deny mining companies access to their land. As the coal seam gas is defined as a 'petroleum', the government of the day has ownership of the gas and can provide a third party, such as a mining company, with a lease to explore and extract the gas without the farmer's permission.



Shutterstock.com/mantisdesign

Australian farmers are concerned about the impact of coal seam gas on the water supply to their farms.

Understanding the text

11 Describe four of the main large-scale crops grown in Australia and their main export markets.

12 How valuable is beef production to the Australian economy and what impact did the 2013–14 drought have on beef producers?

13 Draw a knowledge map to demonstrate the key information relating to the consumption of poultry and eggs by Australian families.

14 Outline the importance of the dairy industry to the Australian economy. Briefly describe the different types of dairy products produced in Australia.

15 List six of the main fish species consumed by Australians. Explain the meaning of the term 'aquaculture'.

16 Identify three of the main horticultural crops grown in Australia and the states in which they are grown.

17 Explain why it is important for Australia to have strong biosecurity protocols in place.

18 Why do Australian scientists believe that biotechnology can be of benefit to the agricultural industry?

19 Outline four ways in which climate change will impact on the future of Australian agricultural production.

20 Explain how both increasing urbanisation and coal seam gas may have a detrimental impact on Australia's farming community in the future.

THINKING SKILLS

Identify the current key trends and issues that could influence the Australian food industry in the next 20 years. Rank the trends or issues according to the impact they will have on the food industry from most to least. Justify your ranking decisions for both the top ranked trend or issue and the one that you think will have the least impact.

LEADING FOOD PROCESSORS AND MANUFACTURERS IN AUSTRALIA

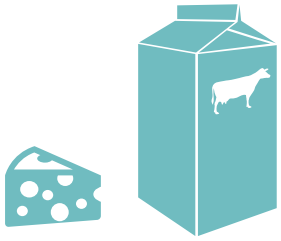
The 100 largest food and beverage companies in Australia generate $100 billion in revenue.

These 100 companies employ 130 000 Australians.

Australian International Foods



a2 Milk Company



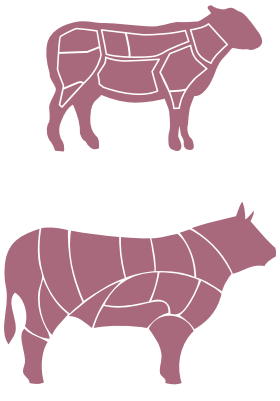
Fonterra



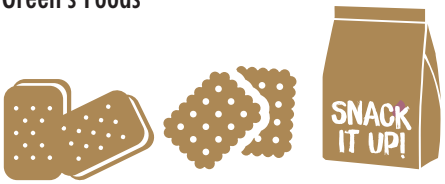
General Mills



JBS Australia



Green's Foods



Goodman Fielder



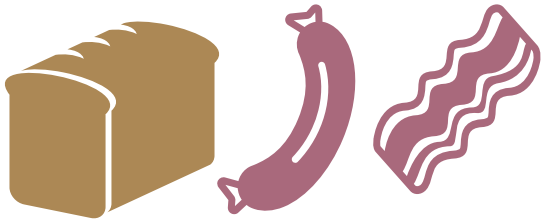
McCain



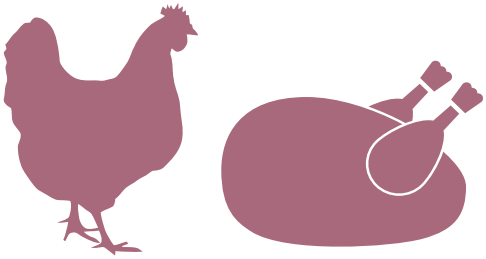
Devondale Murray Goulburn



George Weston Foods



Inghams Enterprises



Simplot



10

FOOD PROCESSING IN AUSTRALIA TODAY

KEY TERMS

Flavour house refers to a company that produces flavour compounds that can be used by a food-processing company to improve or enhance the natural flavours in food.

Food manufacturers are companies that process foods.

Food processing refers to the practices used by food and beverage companies to transform raw plant and animal materials, such as grains, produce, meat and dairy, into products for consumers.

Food service sector refers to cafes, fast-food outlets and restaurants where consumers eat, as well as the catering institutions that provide food for schools, hospitals and nursing homes.

Proprietary products are products that a company makes under its own brand.

Food processing in Australia

According to the Australian Government Department of Agriculture and Water Resources, more than 90 per cent of the fresh fruit and vegetables, meat, milk and eggs sold in our supermarkets are grown and supplied by Australian farmers.

However, when we go shopping in the supermarket it is clearly evident that a substantial proportion of the highly processed, shelf-stable foods that line the shelves are imported into Australia. Foods that are most likely to be imported are canned fish, canned vegetables, Asian ingredients such as pickled ginger and coconut milk and some rice varieties, and pasta products. While it might appear that much of the processed food we consume as a nation is imported, Australia does in fact have a successful food-processing industry that produces safe and nutritious food for consumers.

WHAT IS FOOD PROCESSING?

The definition of **food processing** used by the John Hopkins University Bloomberg School of Public Health is that it 'refers to the practices used by food and beverage industries to transform raw plant and animal materials, such as grains, produce, meat and dairy, into products for consumers.' It goes on to state that 'the companies that process foods are sometimes called **food manufacturers**'.

Some examples of food processing are: freezing vegetables such as peas; milling wheat into flour, making butter and cheese from milk; dehydrating fruit. Food processors use large factories or food-processing plants to transform the raw ingredients into food that is safe to eat and products that consumers can purchase.

Leading food-processing and manufacturing industries in Australia

According to data released in December 2015 by research company IBISWorld, Australian food and beverage companies are continuing to thrive. A report by the company, *Australia's Top 100 Food & Drink Companies 2015*, highlights the strength of the sector and states that 'the largest 100 food and beverage companies in Australia generate in excess of $100 billion in revenue (up from over $96 billion in 2014–15) and employ more than 130 000 Australians'.

AUSTRALIAN FOOD PRODUCERS

Australia's food-processing industry includes large multinational companies, medium-sized companies and small family-run companies. The vast majority of the food we purchase on a daily basis is produced by major food-processing companies in Australia.

a2 Milk Company is an Australian milk-processing company that was recently listed as one of the nation's top 100 food that beverage companies. The company produces specialist milk products for the fresh-milk market as well as cream, long-life milk and infant formula.



a2 Milk products are popular with consumers.

Devondale Murray Goulburn is Australia's largest dairy foods company. The company produces dairy products for the retail market under the Devondale and Ascend brands. Its dairy products are also widely used in the **food service sector**. Almost half of the company's produce is exported to overseas markets.



Devondale produces milk, cheese and breakfast drinks for consumers.

Fonterra is one of Australia's largest milk processors. The company collects over 22 billion litres of milk each year , which it uses to produce milk for the fresh-milk market, cheese, yoghurt, dairy desserts and dairy spreads. Its brands include Bega cheese, Mainland Cheese, Perfect Italiano, Riverina Fresh, Ski Yoghurt and Western Star.



Mainland and Bega cheese are two of Fonterra's most popular brands.

General Mills is another major Australian food processor. It manufactures a wide variety of products, including Betty Crocker baking mixes and desserts, Latina fresh pasta and sauces, Nature Valley snack museli bars, Old El Paso Mexican foods, and Pasta Master chilled Italian meals and pasta sauces.



General Mills produces a wide variety of products for consumers.

George Weston Foods is one of Australia and New Zealand's largest food-producing companies. It produces a wide range of bread and smallgoods under a number of brands including Tip Top, Bürgen, Abbott's Village Bakery, Don and KR Castlemaine.



KR Castlemaine hams, Abbott's Village Bakery and Tip Top bread are produced by George Weston.

Goodman Fielder is one of Australia and New Zealand's leading food-processing companies. It produces some of the most well-recognised supermarket brands, including Meadow Lea, Praise, White Wings, Pampas, Helga's and Wonder White. The products it sells under these brands include bread, margarine, flour, dressings, condiments, mayonnaise, frozen pastry, cake mix, desserts, sauces, vinegar and cooking oils.



White Wings, MeadowLea, Helga's and Wonder White are some of Goodman Fielder's top brands.

Green's Foods is an Australian-based company that produces food products under a range of brands, including Green's, Lowan, Poppin, Basco, Paradise and Waterwheel.



Green's Foods produces a range of cake and biscuit products.

Inghams Enterprises is a major Australian processor of poultry products that operates in approximately 100 locations across Australia and New Zealand. The company supplies fresh and frozen poultry products to the supermarket sector for Australian consumers, and to the hospitality and food service industry.



Inghams Enterprises produces a variety of fresh and frozen poultry products.

JBS Australia is the largest meat-processing company in Australia. It has five feedlots and a number of processing facilities in mainland Australia and Tasmania where it processes beef and lamb carcasses. The company exports to 80 countries worldwide.

Teys Australia is another major Australian beef processing and exporting company. It is located along Australia's eastern seaboard and produces fresh meat, delicatessen smallgoods and convenience meals.



Photo courtesy JBS Australia

JBS Australia is one of Australia's major meat processors.

McCain is an Australian food processor of frozen vegetables, main meals and pizzas and snacks for consumers. The company's range of frozen vegetables, potato products and some of its meals are marketed under the McCain brand. It also produces a range of healthy frozen food options under the Healthy Choice brand. McCain operates a major frozen-potato processing plant in Ballarat, Victoria. Recently, the company announced a $10 million upgrade of its potato-processing plant in Smithton, in northern Tasmania.



The McCain product line includes French fries and frozen vegetables.

Simplot is one of Australia's leading food manufacturers and processes a wide variety of foods including vegetables, seafood and meat. It produces chilled, frozen and shelf-stable products under a number of brands, including Edgell, John West, Leggo, Birds Eye, Lean Cuisine and Seakist.



John West seafood products are produced by Simplot.

Understanding the text

1 How much of the food that Australians consume is produced locally?

2 Identify the types of food products that are more likely to be imported.

3 Examine the highly processed products in your home or school pantry and identify four products that have been imported.

4 What does the term 'food processing' mean?

5 Give two examples of processed foods other than processed wheat or milk foods.

6 Identify two of Australia's largest milk processors and give examples of the products they produce.

7 List four examples of the types of products produced by General Mills.

8 Identify the similarities in the company structure and the products produced by George Weston and Goodman Fielder.

9 Draw a knowledge map to demonstrate the types of meat products produced by Inghams Enterprises, JBS Australia and Teys Australia.

10 Outline the main products produced by McCain. Why would McCain locate its frozen-potato plant in Ballarat?

Australian International Foods

Australian International Foods is an example of an Australian food-processing company that has been extremely successful in producing a wide range of high-quality food products for Australian consumers and international markets.

About the company

Australian International Foods was the brainchild of Bala Mahendran and Padmini Balakumar who, after arriving in Australia from Sri Lanka, wanted to combine their love of food and sense of creativity by working in the food industry. They were able to use their combined skills in international banking and engineering to establish the company with the aim of producing high-quality foods using ethically sourced ingredients. The company, located in Scoresby, Victoria, was established in 2000. Its products are sold in major Australian supermarkets including Coles and Woolworths and the international membership warehouse chain Costco. Its products are also widely used within the food service industry and are exported to Japan and Taiwan.

WHAT DOES THE COMPANY PRODUCE?

Australian International Foods produces a wide range of chilled and frozen snack foods and meals for Australian and international consumers.

Markets	Types of food	Brands
Retail • Coles • Woolworths • Costco • IGA **Food service** • Quick-service restaurants • Institutions • Aged care/ hospitals • Airlines **International markets** • Japan	**Frozen and fresh** • Snacks • Meals and meal components • Value-added meat products	**Proprietary brands** • Darshan • Petite Cuisine • ChopStix • Dos Caminos **Private label brands** • Major supermarket brands

Types of products produced by Australian International Foods

Proprietary products

Australian International Foods produces a wide range of **proprietary products**; that is, products that it sells under its own brands. The company's proprietary brands are Darshan, Petite Cuisine, Dos Caminos and Chop Stix. Some of the products marketed under these brands include a range of savoury snack foods for home entertaining such as vegetable samosas, savoury chicken rolls, onion bhajis, falafels, Italian style meatballs, arancini, risotto balls and couscous bites. Its proprietary-brand frozen meals include lamb rogan josh, chicken korma, beef in black bean sauce, butter chicken, chicken tikka masala, Thai green chicken curry, chilli con carne and meatballs in red wine sauce.



Darshan spring rolls are a popular entertainment food.

Private label products

The company also produces a wide variety of private label products for the supermarket sector. Private label products are products that a supermarket sells under its own company name. Australian International Foods works closely with major supermarkets to produce a wide range of chilled and frozen foods. More recently, it has begun to produce chilled products with a short shelf life such as fresh tapas products and schnitzels, which supermarkets sell through their chilled cabinet. The supermarket private label range of both frozen and fresh chilled products are Australian-made, using Australian ingredients wherever possible. Some of the private label products are vegetable or lamb samosas, Indian-style selection, ham and cheese croquettes, falafels, Greek-style meatballs, beef and pork schnitzels and pork chops, chimichanga, arancini, chicken Kiev, empanadas and spring rolls.



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Ham and cheese croquettes are a popular private label product

Meal components

Another aspect of the company's food production is the preparation of meal components for other Australian food-processing companies. For example, it makes meatballs and mashed potato that are used by one of Australia's largest food processors in its meals. The meatballs and mashed potato are used in pre-prepared meals for the food service industry, such as the hospital and nursing home sector.

International markets

Australian International Foods currently exports some of its proprietary products to a major membership warehouse chain in Japan. These products are well received in the international market because of their 'clean green' image and the company's reputation for supplying quality, wholesome products.

FACTORS THAT HAVE CONTRIBUTED TO THE SUCCESS OF THE COMPANY

The success of the company has been built on five key factors.



Factors that have contributed to the success of Australian International Foods

Food safety and quality assurance

One of the most important factors in the success of Australian International Foods is its reputation in the food-processing sector as a producer of safe, high-quality food products.

Bala Mahendran and Padmini Balakumar purpose-built their Scoresby factory from the ground up, and as such, they have been able to establish the highest food safety standards of any Australian food-processing



HACCP certification is a mandatory FSANZ requirement.

company. Along with every other food-processing company in Australia, it is a mandatory requirement that Australian International Foods meets the food safety standards of Food Standards Australia New Zealand. This meant that before the company could begin producing their first product – their Darshan brand savoury beef rolls – it needed to ensure it had a Hazard Analysis Critical Control Points (HACCP) program in place.

Today, the company is one of the few food-processing companies in Australia that has also achieved an AA British Retail Certification (BRC) rating – considered to be one of the highest levels of food-safety certification in the world.



An AA British Retail Certification is one of the highest levels of food-safety certification.

In addition to these legal requirements, the company must also pass the quality assurance inspections of the companies for which it produces private label products, such as Coles or Woolworths. For example, the major supermarket companies regularly use an independent auditor to inspect their premises to ensure these premises meet their own high standards of quality assurance.

To be able to gain an export licence, the company must also meet the requirements of FSANZ and the Department of Agriculture and Water Resources, ensuring that its products are produced in line with the food safety requirements set out in the Food Standards Code.

Staff training in food safety procedures is continuous and a key feature of ensuring food safety. Australian International Foods has a team of fully qualified Quality Assurance and Food Safety staff who ensure that the products are produced in accordance with the quality standards for each stage of production.

Some of the company's key food safety procedures are listed here:

- A flow chart of the HACCP program for every product is developed, identifying the hazards, critical control points (CCPs) and corrective actions to be taken.
- The company has established a comprehensive traceability system – every batch number of every ingredient is recorded. The company also keeps a food sample of every production run, labelled with the batch number and date for traceability in case there is a product complaint or recall.
- All allergen ingredients are clearly labelled and separated in their storage areas and marked with an orange sticker in preparation for their use in a product.
- As part of Good Manufacturing Practice (GMP), all equipment is checked pre- and post-use to avoid any contamination, including line clearance for allergens. Periodically, swabs are taken on the machinery and machinery parts and tested for microbial count. Some of the basic CCPs for any product would include:
  - cooking temperatures
  - temperature of the frozen/chilled product before packing
  - foreign body detection, for example, metal detection.
- The identified Critical Control Points (CCPs) are tested throughout the production process. For example, in the production of meatballs, one of the key CCPs is to ensure the meatballs have a core temperature of –6 °C after they have been quick frozen. The staff periodically checks the core temperature of the products and records the temperatures as part of their record keeping and verification process.
- To ensure the equipment in the factory is clean and hygienic, the staff uses a chlorine-based food sanitiser to thoroughly clean down all the machinery used in the production process. Following the cleaning process, they undertake a full check of the machinery, taking swabs to check that the microbial count is within safe limits. The machinery is then completely covered when not in use. Before it comes back into use again, the staff undertakes a pre-operational check of the machinery.



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A probe thermometer is used to check the core temperature of products.

Understanding the text

11 List the main types of products produced by Australian International Foods.

12 Explain the difference between a proprietary product and a private label product. Use examples to support your answer.

13 Identify two food products that Australian International Foods makes for another major Australian food processor and explain how they are used in the food service sector.

14 Why has Australian International Foods been successful in selling products to Japan?

15 Identify one mandatory food safety standard that Australian International Foods needed to establish before they could begin operation.

16 What is the highest level of food safety certification held by Australian International Foods? Explain why you think the company decided to seek this level of food safety certification.

17 Outline the role of Quality Assurance and Food Safety staff in the food-production process.

18 Explain how the company is able to trace their products in the event of a product recall.

19 Why is a probe thermometer an important piece of equipment used by the company?

20 Draw a simple flow chart to demonstrate the steps the company uses to ensure machinery is hygienically clean before use.

Strategic planning

To be successful in any sector, it is essential that the company keeps abreast of industry trends and consumer demands. This type of strategic planning has been one of the keys to the success of Australian International Foods. The company ensures it stays up-to-date with the latest developments in ingredients and flavours, health, food processing and packaging by examining the latest overseas trends as well as by examining consumer data obtained through local and international research companies. It also consults with some of Australia's main flavour houses to determine the latest trends in flavours that appeal to consumers. **Flavour houses** are companies that produce flavour compounds that can be used by a food-processing company to improve or enhance the natural flavours in food.

Food trends

The latest trends that will be evident in some of Australian International Foods' new product development will include:

- Spanish, Mexican and Korean flavours
- superfoods or health foods that contain ingredients such as quinoa, buckwheat and kale
- exotic spices and spice mixes such as the South American peri-peri
- small, bite-sized finger foods and foods on skewers
- entertainment packs for casual dining
- convenience foods ready to cook.

One of the new products that Australian International Foods is developing is a kale and quinoa



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Arancini balls



With permission of Australian International Foods

An entertainment variety pack



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Ready-cooked foods

vegetable patty made of quinoa, corn, sweet potato, kale, black beans, chia seeds and flax seeds to appeal to the health-conscious consumer and 'superfoods' market.

Australian International Foods is also using buckwheat as a coating for its range of pre-prepared pork cutlets and beef schnitzels. Its new chicken Kiev with peri-peri seasoning has been developed in response to the demand for foods with exotic spices and flavourings.



Photo with permission of Coles

Buckwheat as a coating for pork cutlets and beef schnitzels is one of the latest health trends.

Innovation, creativity and flexibility

Building a strong relationship with the supermarket sector has meant that the company needed to be very creative, flexible and responsive to the latest food trends. Currently, it is developing a variety of chilled products for the supermarket sector, aimed at filling a demand by consumers for fresh tapas-style entertainment products. The new fully cooked, ready-to-eat deli products include:

- arancini with a spicy Bolognese filling
- lamb samosas
- onion bhaji – onion rings coated in a chickpea flour batter
- couscous croquettes
- pumpkin falafel with harissa
- bacon and cheese croquettes
- meatballs in red wine sauce.



Tapas-style entertainment products

Collaboration with top Australian chefs

Australian International Foods has been creative and innovative by collaborating with top Australian chefs. These chefs have assisted them in their food product development by advising them on ingredient combinations and the flavour profiles of their products.

Fresh chilled products for children

Another innovative step the company has taken is to work with the supermarket sector to develop a range of fresh pre-prepared food products suitable for children. This range of products will be available in the chill cabinet of the supermarket so that parents can simply stop on the way home from work and purchase fresh, pre-prepared products, suitable for their children's dinner. The new range will include a healthy mini-schnitzel and mini meatballs. A new product currently under development is a 'meatball with hidden vegetables' – a product demanded by many parents!



123rf/margouillat

Fresh chilled products for children have become popular with many parents.

Already prepared, ready to cook

There is also strong consumer demand for products that are pre-prepared and simply ready to cook, but still allow the family member to fulfil their desire to prepare a 'home-cooked' meal. With this market in mind, Australian International Foods recently took another innovative step by becoming the first company to produce a crumbed, schnitzel-style, fresh red meat product for the chilled meat cabinet that does not show signs of meat juices. At present, the company purchases sliced meat from a meat processor and then uses an innovative crumbing technique to prepare the schnitzel. Eventually, it aims to do its own slicing of meat with a view to enhancing shelf life.

This product has become popular with consumers because it simply needs a few minutes in the oven or frying pan and can then be served with a salad for a quick family meal.

Flexibility in factory operations

Because the company produces a wide variety of products, its production facility has been designed to be flexible. It has three flexible production lines, two linear frying lines and a spiral oven, steamer, griller line. The output from the cooking lines flows into a spiral freezer. The company has two or three of each different production machines that can be attached to any of the production lines to form a complete production unit for the day.



Production line machinery in the factory

Flexibility in production has been essential in enabling the company to meet the increased demand for its products from the grocery and food service markets.

Product development

The development of products that consumers want to buy is critical to a company's success. In developing a new product, Australian International Foods explores the latest trends in the food industry and always works at least nine months in advance of the required delivery date.

Developing products for private labels

In recent years, the company has been working closely with the supermarket sector in the production of many of its private label products. It now produces more than 25 private label products for a major supermarket. The product development process begins with a design brief established by the supermarket product development team, identifying the type of product desired. For example, the supermarket might want a new product that can be included in the main meal section of the freezer cabinets or it may want a fresh product suitable for the 'entertainment' sector that consumers can purchase from the deli.

The product development team will then begin developing products based on the information outlined in the design brief and may, in addition, submit two or three 'wildcard' products for the company to sample. During the development of the new products, the product development team will submit prototypes to the supermarket at three different times.

First submission

The first submission will include prototypes of four products requested by the company plus the two wildcards developed by the team.

↓

Second submission

The second submission will include the same products with the adjustments agreed on by the supermarket staff and the food product development team, such as an increased intensity of a particular spice or a slightly crunchier coating.

↓

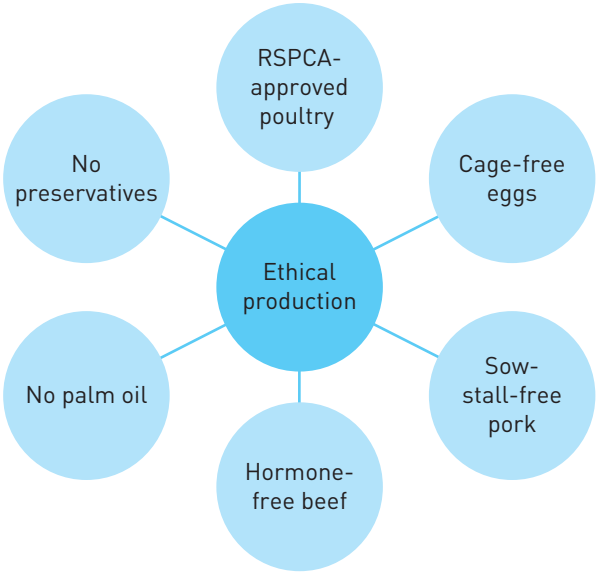
Third submission

The third submission will present the final four products with the agreed adjustments. These products are then tested by a consumer panel to determine their acceptability for the market.

Private label products are submitted to the company on three occasions during their development.

Australian International Foods has a strong commitment to ethical food production and environmental sustainability. This commitment fits closely with the work it does with the major supermarkets that also have strong ethical and environmental policies. Australian International Foods uses only fresh ingredients in its products and sources ingredients from local suppliers. The chicken and eggs used in all of the product range are cage-free and RSPCA-approved, and the company only uses hormone-free beef. The pork used in its products is also ethically sourced and comes from suppliers who guarantee that it is produced from pigs that are humanely treated and is 'sow-stall-free'.

Ethical and environmental responsibility



Australian International Foods is committed to ethical food production.



Image used with permission of Coles

All pork is guaranteed to be sow-stall-free.

Another commitment Australian International Foods has made to ensuring environmental sustainability is that it does not use palm oil in any of its products. The production of palm oil involves the clear felling and destruction of many of the world's valuable rainforests and has led to a reduction in the population of endangered animal species such as the orangutan.

The company has also responded to consumer demand by guaranteeing that its products are free of all additives and preservatives that are listed as red or amber E numbers – these are food colours and flavour enhancers that have been linked to food sensitivity in some children.

One concern the company has noted in recent months is the increasing demand for products containing ancient grains such as buckwheat and quinoa. This has led to an ethical dilemma for the company because there is now evidence that the popularity of ancient grains in Western countries is affecting their availability and pushing up the prices in many developing countries that rely on them as a food source.

Understanding the text

21 Identify three ways that Australian International Foods stays abreast of the latest industry and consumer trends.

22 Explain the role a flavour house has in the development of a new food product.

23 Explain why, in your opinion, superfoods and exotic spices have become new food trends.

24 What advantage has it been to the company to seek advice from top Australian chefs?

25 Outline two factors that have led the company to develop a new product range aimed at children.

26 Why are products that are already prepared and ready to cook becoming increasingly popular with consumers?

27 Outline the way in which Australian International Foods can be flexible within its factory.

28 Outline four key steps that the company uses when it is developing a new product for a major supermarket.

29 Identify and describe three ways in which the company ensures it operates in a way that is ethically and environmentally responsible.

30 Why does the company ensure it does not use any amber or red E numbers in its products?

Role of the food service sector and major food retailers in Australia

The Australian food service sector, that is, the cafes, fast-food outlets and restaurants, and the catering institutions that provide food for our schools, hospitals, and nursing homes, have a major influence on the types of foods that are available for us to consume. The supermarkets we shop at also influence our food choices through the types of products they produce and sell.

ECONOMIC OPPORTUNITIES PROVIDED BY THE FOOD INDUSTRY

A report by market research company IBISWorld in February 2016 stated that there are approximately 2020 supermarkets and grocery stores operating in Australia and these businesses employ approximately 292 000 Australians. Many young Australians gain their first experience of the working world through part-time employment in the supermarket sector.

In recent years, the Australian cafe and restaurant scene has also grown strongly, and in 2015 this sector alone employed close to 188 000 people. Positions such as wait staff, baristas, cooks, kitchen hands, bar staff, cleaners and managerial staff have made this an important avenue for employment and training for many young Australians.

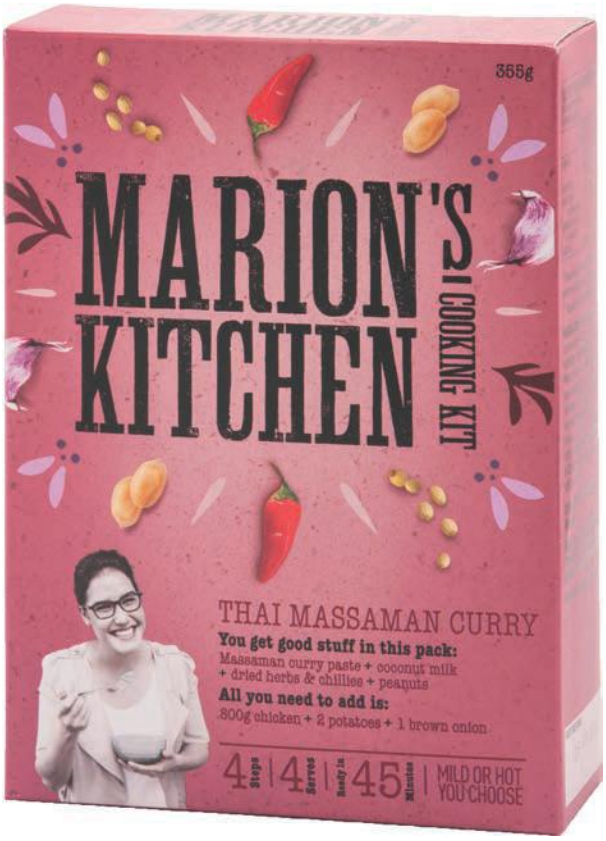
INFLUENCE OF THE FOOD SERVICE AND RETAIL SECTORS ON FOOD CHOICE

Major food retailers and the food service sector have a major impact on the food choices of Australian consumers.

As our lifestyles become busier and we have less time available for leisure, many consumers want to purchase food products that are pre-prepared and require little cooking. Coles, Woolworths and Aldi use research companies to look at the latest consumer trends and then endeavour to produce food products to meet these demands. Consumers may indicate that they want to purchase foods that will provide them with added health benefits, such as being low in fat or sugar, or they may want to purchase foods from the chill cabinet that are already prepared and ready to cook. Food producers then work with the

supermarket sector to develop food products that meet these needs.

However, there is limited shelf space in supermarkets and as some products are added, others must be removed. As a result, some of the products that have been family favourites might disappear and we are forced to choose from those that are currently available.



Supermarkets influence the types of products we buy such as pre-prepared curry mixes.



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Is kale your favourite breakfast food or would you prefer something else?

Cafes and restaurants also influence our food choices. A new cafe might want to set themselves apart from their competitors. A quinoa muesli or poached eggs and kale might be on the breakfast menu or they might follow the latest trend for serving raw or whole foods, so lunch might be a wholegrain and raw carrot and beetroot salad. Wanting to order a simple plate of scrambled eggs might not be an option!

Influence of consumer demand on Australia's food supply

Australian consumers are becoming more vocal in expressing their concern about a range of issues linked to their own health and welfare and to ethical issues in food production. Regardless of whether they are concerned about 'truth in labelling', animal welfare or the impact of food production on the environment, consumers are becoming more actively involved in influencing the types of food that they consume.

In recent years, there has been a groundswell in consumer activism, and consumers are using social media platforms such as Twitter and Tumblr to voice their opinions and to encourage change. Using social media, consumers can post multimedia and other short-form content onto a blog so that it can be shared with people who hold similar views or to inform others, with the aim of changing consumer behaviour.

ROLE OF THE MEDIA

Media organisations, including newspapers and television programs, provide readers and viewers with valuable information about a wide range of consumer-related issues. Television news and current affairs programs are avenues through which consumers can develop greater knowledge about an issue of concern to them so they are in a better position to make a more informed choice when they purchase products.

The media also influences consumers to try new food products and flavours by highlighting them in food magazines and articles such as *The Age Good Food* weekly supplement. An *Age* article on the 'Top 10 new-wave hot sauces', for example, encouraged readers to experiment with some of the new chilli flavours that are available in our supermarkets and food stores.

Activity 10.1

Subway opts out of cage-egg production for its restaurants

Read the article then answer the questions below.

1. Evaluate the validity of this news article. Consider the reliability of the sources of information used in the article, the context and presentation of evidence.
2. Explain why Subway has decided to only use cage-free eggs in their business.
3. What other organisations are removing cage eggs from their product lines?
4. Outline the arguments made by Mr Dion Andary to counter the move to cage-free eggs made by Subway.
5. What role do you think an organisation such as the ABC or another media outlet has in the debate on cage-free eggs?

SUBWAY FAST-FOOD CHAIN OPTS OUT OF CAGE-EGG PRODUCTION FOR ITS 1400 AUSTRALIAN RESTAURANTS

The Subway fast-food chain is known the world over for its catchy jingle encouraging customers to 'Eat Fresh'.

Now Subway wants customers to eat fresh with a clearer conscience.

The chain uses around 5.5 million eggs across its 1400 Australian outlets each year. Now those eggs will be cage-free.

Animal welfare groups have welcomed the move and are encouraging more companies to follow suit.

'I think more consumers are starting to become more mindful of where their eggs come from and are basically saying "hens in cages aren't acceptable"', said Hope Bertram, Marketing Manager for Humane Food at RSPCA Australia.

'Subway has listened to their customers and as a company they see this as the right thing to do by their customers, but also most importantly for the hens.'

Ms Bertram believes it is the way of the future for many more food businesses.

'Thousands of Australian hens will live a better life thanks to this news, and it shows a lot of leadership and commitment from a company like Subway to only serve cage-free eggs.

'Cage-free generally means a barn laid system. Hens in cages can't flap their wings, they can't bathe, they can't lay their eggs in a nest, which are pretty basic needs for a hen.

'A hen in a cage-free system certainly has more room to be able to do that, and can move more freely about the barn and isn't confined to a cage.'

The trend is moving away from caged eggs, which is estimated to make up 60 per cent of supply in Australia.

Coles no longer stocks its home-brand caged eggs and Woolworths is expected to phase out cage eggs by 2018.

McDonalds has also committed to going cage-free by 2018.

But Dion Andary, managing director of Days Eggs, South Australia's largest egg producer, does not believe the shift away from cage eggs will last.

'It's been trending that way for some years, not based on any fact. It's based on perception and emotion at the moment, there's not too much science involved in it. They're just following consumer trends and are probably five years behind where the UK was with this, and they've reversed that trend,' he said.

'I think the efficiencies with non-cage production have impacted, and I think you'll find there's health [of hens] and other aspects that could impact as well.

Days Eggs is currently expanding its free-range production in the state's mid-north, in response to market demand.

The company's free-range flock will increase to 380,000 with the remaining third to be caged.

'We've future-proofed our business to cater for fluctuations because we do have a lot of interference in the industry from outside, but we feel we're well placed to meet any trend either way,' Mr Andary said.

The RSPCA said any move to uncage hens is a positive one and wants more businesses to follow Subway's lead.

Caroline Winter, *ABC Rural*, 4 September 2015 (adapted)

CONSUMER RIGHTS ORGANISATIONS

Organisations such as the RSPCA and Choice have become important avenues for consumers to become informed about current issues, particularly in relation to animal welfare. They also offer consumers information about strategies they can use to influence current debate and how they can make changes to their own shopping behaviour. These organisations also work actively to influence government policy in relation to animal welfare issues and product labelling.

The RSPCA

One of the key objectives of the RSPCA – the Royal Society for the Prevention of Cruelty to Animals – is to 'educate the community with regard to the humane treatment of animals'. Based on this objective, the RSPCA has been involved in raising consumer awareness on several issues relating to farm animal welfare and its links to consumer purchasing behaviour.

'Hens Deserve Better' and 'Set a Sister Free'

Two consumer campaigns – 'Hens Deserve Better' and 'Set a Sister Free' – were developed by the RSPCA to encourage consumers to take action to persuade all Australian supermarkets to remove cage eggs from their stores. The campaigns highlight some of the key animal welfare issues associated with keeping layer hens in cages.

The 'Hens Deserve Better' and the 'Set a Sister Free' campaigns used high-profile female personalities, such as Michelle Bridges, Laura Csortan, Magdalena Roze and Dr Katrina Warren, to capture consumers' attention and raise awareness of the large number of hens used for egg production that are confined to cages.

The aim of these campaigns was to educate consumers on the issues relating to egg production in Australia, including the life cycle of a hen, the different systems used to produce eggs and how eggs are used in commercial food production. The campaign asked consumers to choose cage-free eggs in the supermarket and to check the product labels on processed food to ensure that the eggs used are cage-free.



Copyright RSPCA Australia

The 'Hen's Deserve Better' campaign encourages consumers to choose cage-free eggs.

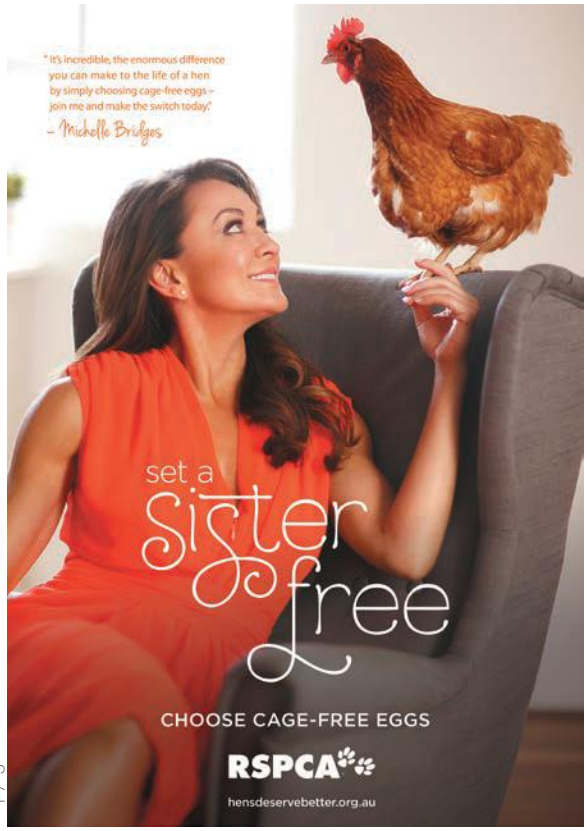
The RSPCA has also been involved in actively campaigning for a legal definition for the term 'free range' so that there is consistency and a clear understanding for both producers and consumers of the meaning of this term when it is applied to egg production.

Choose Wisely

The 'Choose Wisely' initiative has been developed by the RSPCA to encourage consumers to look for cafes and restaurants that serve humanely produced food. This includes the use of cage-free eggs or chicken and pork that has been produced using humane production systems.

The campaign has a two-pronged approach.

- Cafes and restaurants are encouraged to sign up to the initiative so that consumers can be alerted to their commitment to include food on their menu that has been made with ethically produced



Copyright RSPCA Australia

The 'Set a Sister Free' campaign raised awareness of intensive poultry production.

ingredients. Consumers can then easily find that company's business when they search for somewhere to eat in their locality.

- Consumers can use the website to search for a cafe or restaurant that has joined the initiative. Consumers are also encouraged to use social media to spread the word about humane food through Instagram, Twitter and Facebook, using a variety of hashtags such as #RSPCAchoosewisely #ichosewisely #eathumane #humanefood and #cagefreeeggs.

Choice

Choice is a consumer-rights organisation that advocates on behalf of Australian consumers. One of their key aims is to inform and support Australian consumers about issues that are of concern to shoppers. In recent years, Choice has been involved in a number of consumer-rights campaigns.



Copyright RSPCA Australia

The 'Choose Wisely' campaign helps consumers find a cafe or restaurant using humanely produced ingredients.

Free-range egg campaign

For a number of years, Australian consumers have been demanding greater clarity in the labelling of free-range eggs. Choice has been a vocal campaigner for ensuring that consumers are not mislead by egg producers and supermarkets about the type of egg products they purchase. By providing consumers with accurate, relevant and up-to-date information on the development of a national standard for free-range eggs, Choice is helping to inform consumers and to give them the opportunity to have their voices heard by the federal, state and territory food regulators.



Choice

The Choice free-range egg campaign

Free-range bacon, ham, pork and turkey

As a part of this campaign, Choice provides consumers with information about the certification schemes linked to free-range pork and clarifies some of the language that is commonly used in relation to this issue. The information it provides enables consumers to understand the issues such as animal welfare and the current regulations for pork producers.

Palm-oil labelling

Another consumer-rights campaign that Choice has been involved in is the campaign to ensure 'truth in labelling' for products that contain palm oil. The current food standards allow food companies to label palm oil simply as 'vegetable oil'. This means that consumers are not aware which products contain palm oil when they go shopping and therefore cannot make an informed decision.

Hundreds of thousands of hectares of rainforest are being destroyed in Indonesia to establish palm oil plantations, which is having a devastating effect on the environment by releasing climate-changing greenhouse gases. The destruction of the forests is also endangering the lives of the orangutans and Sumatran tigers that live in these areas.

In addition to the devastating impact it has on the environment, palm oil is high in saturated fat and is therefore associated with a number of severe health conditions including heart disease. Along with Choice, other organisations such as Zoos Victoria and Greenpeace are encouraging Australian consumers to become involved and to speak out against the misleading labelling of palm oil.



Choice

The Choice campaign for truth in labelling for palm oil



Picture Media/Reuters/Rosa Panggabean/Antara Foto

Orangutans are endangered as a result of deforestation for palm-oil plantations.

Health Star Rating

During 2014 and 2015, Health Star Ratings began appearing on food labels. This form of food labelling is voluntary and is intended to 'to assist consumers to make informed food purchases and healthier eating choices'. A number of food companies, including SPC Ardmona, Uncle Tobys and Sanitarium, have begun labelling their products with the new food star rating. Coles and Woolworths have also begun to use the Health Star Rating system on their private label products.

However, not all companies have been keen to do so. Choice has argued that consumers can only make an informed choice if they are able to compare the Health Star Rating of products made by different companies. Choice is therefore encouraging consumers to join the campaign to encourage all food-processing companies to label their products with the new Health Star Rating system.



© Commonwealth of Australia 2016

The Health Star Rating helps consumers make an informed choice.

Activity 10.2

Evaluating a consumer awareness campaign

Access the website of an organisation such as the RSPCA or Choice and evaluate a campaign aimed at raising consumer awareness and changing consumer behaviour.

Worksheet



Copyright RSPCA Australia

Information presented to consumers in the 'Set a Sister Free' campaign

1. What is the purpose of the campaign?
2. Who is the campaign targeted at?

Weblink

3. What information is provided on the campaign website?
4. What strategies does the campaign use to promote its message?

Weblink

5. Why would the consumer-rights organisation have decided to develop this initiative?
6. How effective do you think the campaign will be in changing consumer behaviour? Justify your answer.

Understanding the text

31 Based on your own experience, identify two employment opportunities young people may have in the supermarket sector. Outline the skills a young person may develop as a result of this type of employment.

32 Explain how the food retail sector can influence the food choice of consumers.

33 How might the development of a new food product impact on other products available in supermarkets?

34 Give an example of how the food service sector can influence the types of foods available to consumers.

35 Explain how social media platforms are used by consumer activists to express their opinion.

36 Outline two ways the media can influence consumer demand.

37 Describe the aim of the 'Hens Deserve Better' campaign.

38 Explain how the 'Choose Wisely' campaign aims to influence consumer food choice.

39 Why has Choice become involved in the campaign to have clear labelling of palm oil on food products? Your answer should refer to both the environmental impact of palm-oil production and the impact on endangered species.

40 What is the purpose of the Health Star Ratings and why is Choice campaigning to have all food-processing companies use these ratings on their products?

THINKING SKILLS

Worksheet

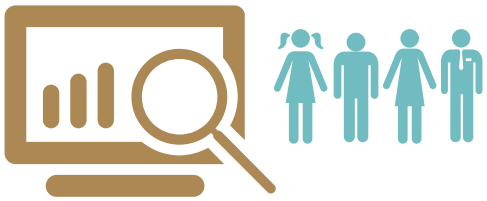
These sentence starters will help you focus your summary notes on the critical content of this chapter.

I learnt that food processing is ...	
Some of the milk-processing companies in Australia are ... and they produce ...	
I changed my thinking about the role of the food service sector on the food choices of Australian consumers because ...	
I am aware that the media has an influence on our food choices because ...	
I notice that the RSPCA influence the food supply by...	
Something I learnt about consumer rights organisations such as Choice is ...	

THE PROCESS OF PRODUCT DEVELOPMENT

MARKET RESEARCH

- Research is conducted to establish information about consumers, such as their age, lifestyle and general buying patterns.



DESIGN BRIEF

- It provides an outline for the new product, which contains specifications, considerations and constraints.
- It gives the aims and intentions of the new product and guides the producer.



PROTOTYPE

- The development of a sample or trial product allows manufacturers to determine if the new product is viable. Aspects tested include, sensory properties, shelf life, and physical properties such as size, shape and packaging size.

PRODUCTION

- The manufacturer produces a scaled-up version of the product to determine if it is ready for full-scale production.
- Packaging and labelling will be designed and full-scale production is ready to take place.



EVALUATION OF PRODUCT DEVELOPMENT/ECONOMIC EVALUATION

- Product evaluation is conducted using tasting panels, and consumer testing determines the appeal of the product and its packaging to consumers.
- An evaluation is also carried out to determine if sales and profit margins make the new product economically viable.

11

FOOD PRODUCT DEVELOPMENT

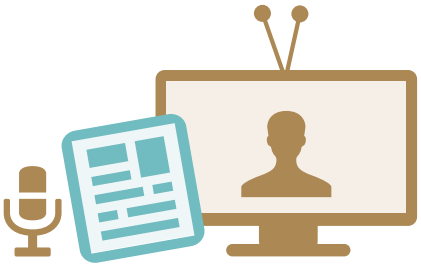
EVALUATION CRITERIA



- Questions are used to evaluate the finished product. They will determine whether the product has met the needs of the client outlined in the design brief.

MARKETING/LAUNCH

- A marketing plan is developed and the new product is launched into the market place.



- Consideration is given to the 4 Ps of marketing – product, place, price and promotion.



KEY TERMS

Considerations are more flexible than constraints and may not direct the outcome of the product in the same way as a constraint.

Constraints are aspects over which the designer has little control, but which can restrict or create problems in the development of the product.

Life cycle of a product includes all stages of the life of the product, from development stage, through the periods of growth and maturity in the market place to its eventual decline.

Prototype is a sample product or trial model of the product idea that was outlined in the design brief.

Specifications are the constraints and considerations that will impact on the product development.

Developing new food products

Developing new products in the food industry is very important as it ensures the company remains profitable and consumers' changing needs are met. Each company has a product mix; that is, it often has hundreds of products that are continually evolving – old products that are dying, some products that are reaching maturity, other products that are rapidly growing and new products that are being introduced.

The product development process must include product improvement, product line extension, 'me too' products to match competitors' products, product relaunches and new product innovations.

A line extension is an additional product produced by the company in the same category, which extends the range, for example, by adding a new flavour, package size or adding ingredients, such as fibre.	**A 'me-too'** product is a copy or similar product to an existing commercial food product produced by a competitor.

Types of product development

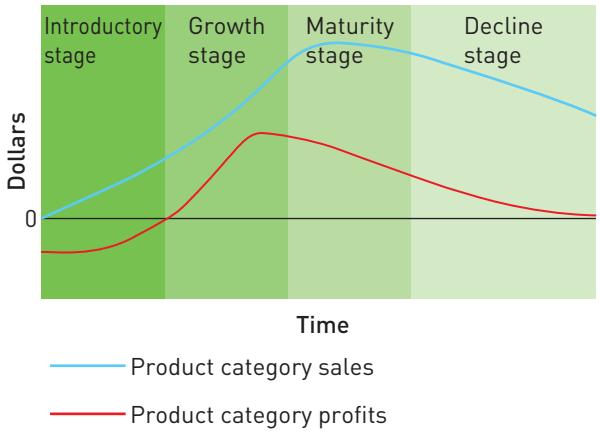
LIFE CYCLE OF A PRODUCT

Growth is the lifeline of any successful business. In the food-manufacturing industry, maintaining a product line that has strong brand following is critical to the success of the company.

One method food manufacturers use to track the success of their product range is to develop a profile of the product throughout its **life cycle**. The life cycle of a product includes all stages of the life of the product, from the development stage, through the periods of growth and maturity in the market place to its eventual decline.

A company will track the sales of each product in its range at each stage of its life cycle to determine the profitability of the product and to evaluate whether the product will need to be replaced by a new product. Alternatively, new marketing strategies can be implemented to extend the life of the product and refresh the product in the eyes of the consumer.

The product life cycle is often presented in the form of a graph that illustrates when a product reaches its peak in the market place or when consumers begin to tire of it. This information is useful to food manufacturers because it enables them to evaluate when a product should be replaced with a new product that will better meet the needs of the consumer.



The life cycle of a product

Characteristics of the life-cycle stages

Introductory stage

- High failure rates
- Regular market research conducted
- Product modifications need to be made
- High marketing and production costs

Growth stage

- Increasing rate of sales
- Initial healthy profits
- Development costs recovered

Maturity stage

- Falling sales growth due to competition
- Prices and profits begin to fall

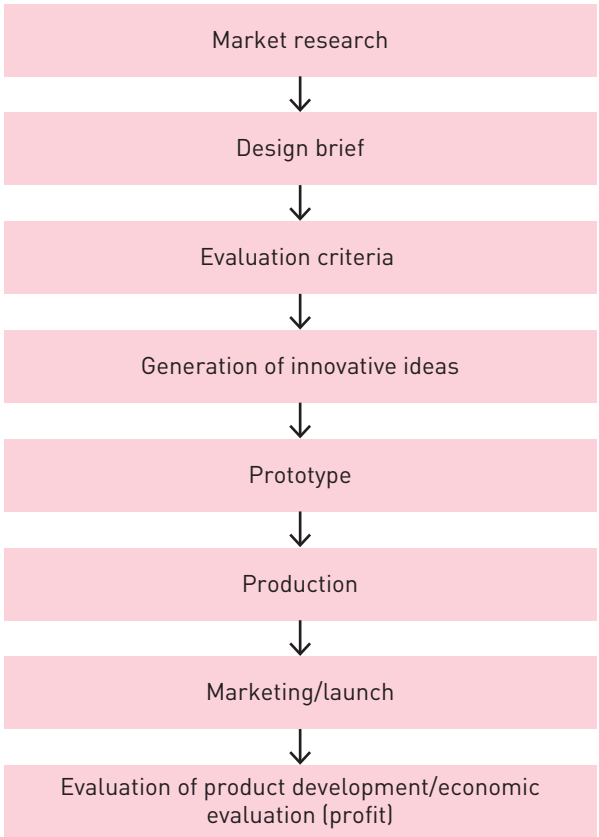
Decline stage

- Decisions need to be made on ways to revive sales by extending the life cycle of the product. This can be done by:
  - developing line extensions with new flavours and packaging
  - developing a new product, for example, with on-trend flavours or whole wheat to add fibre or added nutrients
  - thoroughly testing the marketing campaign before the launch of the new product.
- Product life-cycle extension will appear to be successful if:
  - the new product is adopted by current users
  - there are sales to new users
  - profits begin to increase.

Process of product development

Whether an existing product is to be redeveloped through a line extension, a new product is to be developed in response to competition, or a new product range is to be developed, food manufacturers will approach the problem by following the design process. The design process is a series of systematic steps that the manufacturer takes to develop the new food product.

However, while the company will begin the process of design in a systematic way, sometimes the design process may be interrupted at various stages as problems arise. This often occurs in the stage of developing alternatives, or when the company is designing a plan for the production of the product. If problems do occur, the project team may need to revert to the investigation or research stage, so that additional information can be found and solutions suggested.



The process of product development

MARKET RESEARCH

Market research is a vital part of all new product development. Companies collect and analyse a wide range of information to assist them in their decision-making about product development. Through market research they find out about the demographics of their consumers, including information about their gender, age, socio-economic background, lifestyle, work and family life, and general buying patterns.

Market research specialists also observe the societal trends and influences in the market place, which can create opportunities. They are especially interested in any consumer needs they have identified that have not been met, such as the demand of health-conscious consumers for fat-free foods, or foods that are low in sugar, or high in fibre. Increased work participation has also led some consumers to demand products that make their meal preparation easier and less time-consuming.

The company then uses the information collected as a result of market research to develop the concept for a new product.

DESIGN BRIEF

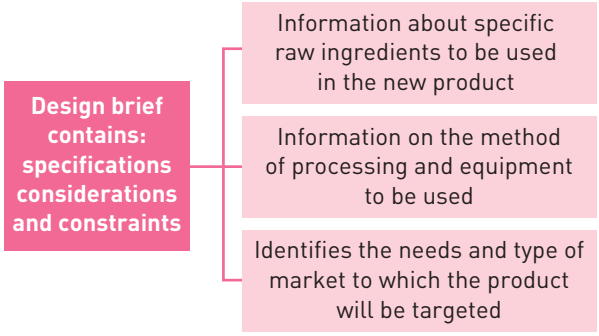
The initial idea for a product may come from marketing specialists, who present a concept for a new product that they have developed as a result of observing trends in the market place, or it may result from technical research.

Regardless of the origin of the idea, a design brief – a statement or outline of the new product – is developed from the initial proposal. The design brief clearly defines the aims and intentions of the new product and includes all of the specifications or constraints and considerations. It provides directions for the product development teams.

It is important to keep the initial design brief simple to avoid misunderstanding during the design and development of the product. A misinterpretation of the design brief could result in the company wasting valuable resources, including time and money if the product developed does not fulfil the original aim. Once the initial design brief has been established and accepted, a separate production brief will be prepared for different sectors of the manufacturing process, including the food technologists and packaging technologists.

Components of a design brief

The aim of the project must be written in clear and unambiguous language. The design brief outlines the focus of the new product and what is to be achieved.



Components of a design brief



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Information provided by the specifications

Specifications – constraints and considerations

Another important aspect of the development of the design brief is establishing the specifications or constraints and considerations that will impact on the product development. **Specifications** are the constraints and considerations that will impact on the product development. They act like sign boards that provide information, and direct and guide the design team to ensure the product will meet consumer needs and be an economic success.

Constraints are those aspects over which the designer has little control, but which can restrict or create problems in the development of the product. They can include the following:

- The company policy limits production to a specific product type, such as biscuit manufacture, pasta production or frozen desserts because of the technical expertise they have developed. There may also be a requirement by management to use the current expertise available within the company, rather than having to purchase knowledge and skills from outside the company.
- There could be certain processing constraints, such as needing to use the existing plant and equipment. The investment in any new machinery would add significant cost to the development of the product.
- There may be a requirement to use existing marketing and distribution channels in order to limit additional expenditure.
- There may also be a requirement to gain a return on the investment in the development and marketing of the new product. This could include financial constraints such as the cost of sourcing and purchasing new raw materials.
- Legislative and environmental constraints will also impact on the product development. Compliance with the Food Standards Code, the Trades Practices Act and industry codes of practice will all impact on the way in which a new product is designed and produced.
- The requirement to develop a new product within a given time frame will also be a significant constraint. The marketing strategy for a new product may require that it be launched at a particular time of the year, such as a new soup just prior to winter or a special Christmas product several months before the festive season.

Considerations are more flexible and may not direct the outcome of the product in the same way as a constraint. Commercial considerations can include:

- competition from other manufacturers that produce similar products
- success of similar products in other countries
- availability and suitability of raw ingredients; for example, some berries have more appealing sensory properties in food products than others, and fruits such as melons may not be suitable for use in desserts or as a flavouring ingredient in yoghurts because of the way they react during processing
- whether existing distribution channels are appropriate for the new product.

EVALUATION CRITERIA

The aim of every company is to develop products that will be well accepted by consumers and therefore help the company to make a profit. A key part of the design process is the development of criteria that can be used to evaluate the product. This will help the company to determine whether the product is likely to meet the needs outlined in the design brief well before the product is launched in the market place.

The key aspects likely to be evaluated include issues such as whether the product will:

- meet the constraints set out in the design brief
- have acceptable sensory properties
- utilise current expertise and resources available to the company
- be profitable for the company.

Understanding the text

1 Explain the difference between a 'me-too' product and a line extension product.

2 Briefly explain the way a food manufacturer can track the life cycle of one of its products.

3 Describe the likely characteristics of the introductory stage of a product's life cycle.

4 Outline options open to the manufacturer at the 'decline' stage of the product's life cycle.

5 What type of information does a company gain through market research? Why is this information important when developing a new food product?

6 Outline the main information contained in a design brief.

7 Explain the difference between constraints and considerations in a design brief.

8 Suggest two possible considerations that may be found in a design brief for a new food product.

9 List four constraints that a food manufacturer might face in the development of a new food product.

10 Explain why it is important to develop evaluation criteria.

DEVELOPING NEW AND INNOVATIVE PRODUCT IDEAS

There are two stages in developing ideas for a new product – the innovative ideas stage and the evaluation and screening of these ideas.

Innovative ideas stage

This stage is the brainstorming or ideas stage when marketing and technical experts in the company think up new ideas and try to determine which products will meet the needs of the consumers.

To generate new ideas, the company will use a range of strategies.

Direct research

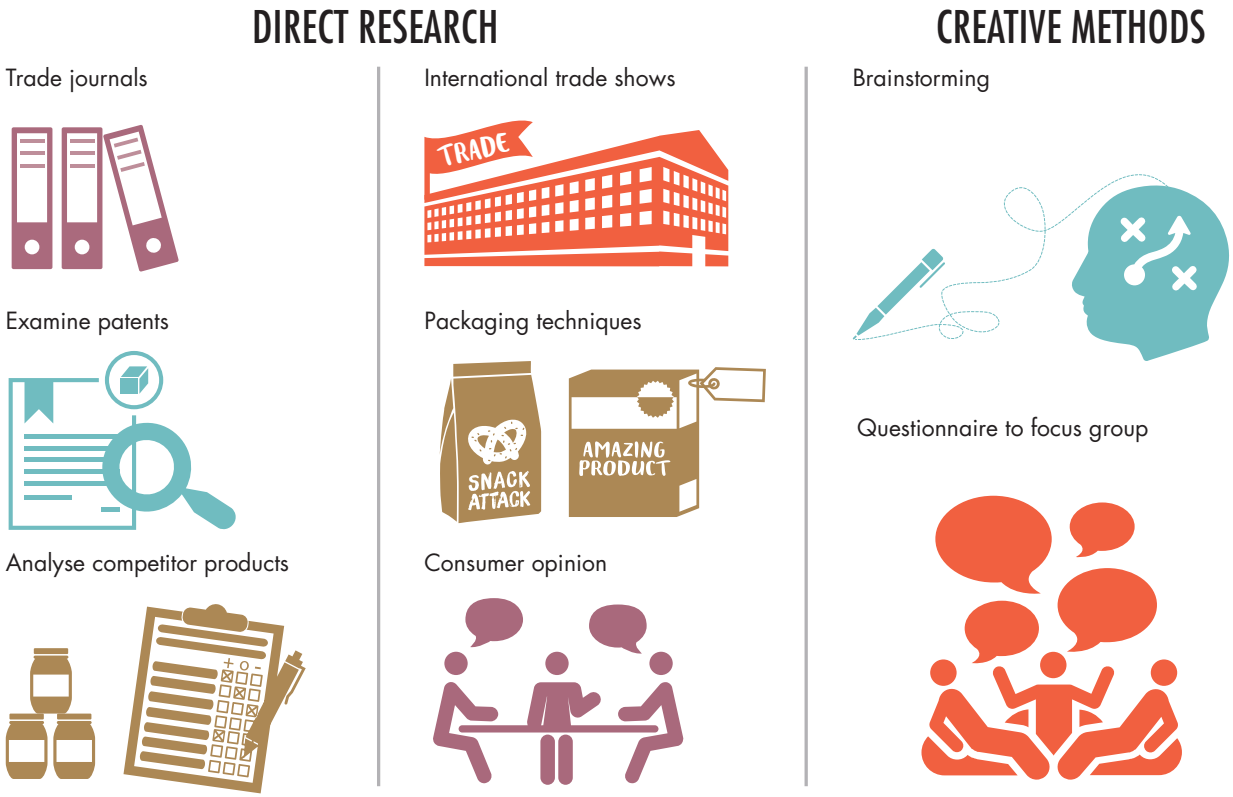
- Visiting international trade shows to research the latest trends and developments in food products
- Examining trade journals to identify current trends in manufacturing techniques, raw materials and packaging
- Exploring current patents to ensure that they keep in touch with competitors
- Scrutinising the products of competitors to determine whether their ideas can be modified or copied
- Consulting consumer opinion about existing products to identify their strengths and weakness
- Seeking information on current trends from existing wholesalers and retailers, and searching for new suppliers of raw materials

Creative research

The company will also use a variety of creative methods to generate ideas.

Groups of marketing and technical experts will work together to generate new product ideas. These sessions can take the form of:

- creative discussions or brainstorming when all new ideas are accepted and reviewed later; ideas generated in these sessions are often described as 'light bulb' moments
- detailed questionnaires given to focus groups to stimulate ideas about emerging needs and on-trend ideas in the community – consumers are asked what they like to eat, when and where they are eating it and what they would like to see in a new product.



Methods used to develop new product ideas

Evaluating and screening ideas

Once a broad range of ideas has been generated, the first step is to undertake first-stage screening, where each idea is assessed against a set of criteria to determine whether they meet these minimum requirements. This is often presented as a matrix table with a simple pass/fail test. Of the original ideas, approximately 30 per cent will proceed to the next stage.

Second-stage screening involves a detailed analysis of the raw materials required to produce the new product, the equipment requirements and availability, the cost of new equipment, the availability of technical expertise, likely consumer demand and prospective sales. This screening will ensure that only the two or three products with the potential to succeed will be developed further.

Matrix table for a new product

PRODUCT IDEAS	CRITERIA FOR ANALYSING A NEW DESSERT				
	Production technology	Existing skills	Consumer acceptance	Marketing and distribution	Rating
PRODUCT 1	Pass	Pass	Fail	Pass	Fail
PRODUCT 2	Pass	Pass	Pass	Pass	Pass
PRODUCT 3	Fail	Pass	Fail	Pass	Fail

PROTOTYPE AND PRODUCT TESTING

The next step in the development of a product is to develop the ideas into a sample product or **prototype**. A prototype is a sample product or trial model of the product idea that was outlined in the design brief. It is produced on a very small scale to see whether the product idea is likely to be viable.

In developing the prototype, the food technologists carry out a range of experiments to determine the best combination of ingredients to ensure the product has appealing sensory properties and the shelf life of the product is maximised. Their experiments also establish the processes to make the best product possible. Another important aspect is the need to develop a prototype for the packaging to be used

for the product, considering issues such as shelf life, product protection, ease of handling and distribution, labelling requirements, consumer appeal and environmental sustainability.

The development of a prototype is a critical stage in the development of a product because it enables the company to:

- determine the ingredients required to produce the product and evaluate whether they will be available during production
- evaluate the nutrient content of the product and make adjustments if necessary
- assess the sensory properties of the product to ensure they will be appealing to consumers
- evaluate and adjust the physical properties of the product, such as its size, shape, weight, packaging size, and its ability to be reheated or frozen
- determine whether the product can be manufactured using available equipment
- evaluate whether current staff have the technical expertise and knowledge to develop the planned product
- estimate the costs involved in manufacture and evaluate whether the product will be economically viable
- evaluate the shelf life of the product.

Once a prototype has been produced, it is subjected to qualitative or sensory analysis such as taste-testing by the project team and focus groups to evaluate the appearance, aroma, flavour, texture and mouthfeel of the product, and suggestions for improvements are made. Comparison screening may also be undertaken by the company to ensure that the product will be competitive with similar products in the market place. This can involve purchasing a competitor's product and undertaking both a quantitative analysis and qualitative evaluation of the product and comparing it with the prototype. This will identify areas for improvement so that the product can offer enhanced features to the consumer.

Sometimes products are rejected at the prototype stage because it is apparent that while in theory they seemed appropriate, the ideas will not translate into a feasible product. If it appears that the product is likely to be acceptable, a recipe will be formulated ensuring that it meets all legal requirements.

PRODUCTION

Having developed a successful prototype, the company will then move into the production phase of the product development. To do this, the company begins production trials in which the prototype is scaled up for production. The production trials take place in a pilot factory, which has similar equipment to that used in the main factory, but on a smaller scale.

The purpose of the production trials is to determine whether it is possible to replicate the prototype using full-scale equipment and commercial volumes of ingredients. Often the process engineer who is responsible for the scale-up to full production has to make changes to the formulation developed for the prototype. For example, sometimes the types of ingredients used in the prototype don't perform as well when used in large quantities, and adjustments may be needed. Alternatively, it could be that the proportion of ingredients needs to be altered to make the product as close as possible to the prototype.

During the scale-up, the process engineer will test the performance of any new equipment to check that any manufacturing problems can be overcome before it goes into commercial production.

Finally, the process engineer designs the production line to be as efficient as possible, specifying:

- the exact ingredients to be used
- the precise processes required in the production, for example, whether the melt-and-mix method or the creaming method is used
- the processing conditions such as oven temperature and length of baking or chilling
- a detailed Hazard Analysis Critical Control Points (HACCP) system.

Packaging and labelling

Packaging and labelling is an important stage in the development of the product, as the packaging often sells the product.



Considerations when designing food packaging

MARKETING

A marketing campaign must also be developed to help launch the new product into the market place. The company may have its own marketing department, which is responsible for developing a promotional campaign for the product, or it may use the services of a professional marketing company. The goal of the marketing campaign is to encourage consumers to try the product – it doesn't matter how good the product is if no one buys it.

After consumers have made their initial purchase, the marketing campaign must encourage them to become repeat purchasers to maintain market sales.

The company will start planning the marketing campaign long before the first products come off the conveyor belt.

Product, price, place and promotion

A key feature of the development of a successful marketing plan is establishing the marketing fundamentals for the campaign, the '4Ps' – product, price, place and promotion. This means answering some key questions about the product:

- What is the product and who is the target market?
- What price can it be marketed at to make a profit for the company but still be acceptable to the target market?
- Where is the best place or location to sell the product that it is accessible to the target market?
- What is the best way to promote the product so that it is widely recognised by consumers?

The product launch is a key feature of the marketing campaign when the new product is introduced into

the market place on a large scale. The launch usually includes an intensive advertising campaign, often involving television and magazine advertising, social media, billboard signage, in-store promotion and taste-testing. The marketing campaign must be exciting and create interest in the product to encourage consumers to purchase the product, not just once, but regularly so that the product continues to make a profit for the company.



The marketing mix

Understanding the text

11 Outline the two ways in which new product ideas are developed. Why are questionnaires given to consumer focus groups an important research tool?

12 Describe the two methods used for screening and evaluating ideas for a new product.

13 What is a prototype? Explain why the development of the prototype is a valuable process for the food manufacturer.

14 Outline the main steps in the production phase of the development of the new food product.

15 What is meant by the term 'scaling-up' a recipe and why is it important to test this during production trials?

16 Explain why packaging and labelling is an important stage in the development of the product.

17 List five factors the company would need to consider when developing the packaging for the new food product.

18 Explain why marketing is a critical step in the development of a new food product.

19 Suggest some important considerations when determining the price of a product.

20 The launch of the new product is an important step in establishing consumer awareness; suggest two ways the product could be launched.

EVALUATION OF A NEW FOOD PRODUCT

A comprehensive evaluation of all stages in the development of the product is undertaken by the company to make sure that the product meets the requirements set out in the design brief and that it will be successful in the market place, so that the company makes a profit. This will include an evaluation of the product, including its qualitative and quantitative characteristics, the production processes, its economic viability and the marketing campaign.



Evaluation of a new food product

Product evaluation

One of the most important aspects of the food product development is to complete an evaluation of the physical and sensory properties of the product once the final prototype and scale-up have been completed. Although the company will undertake a similar evaluation during the development of the prototype, the company usually does some follow-up product evaluation using tasting panels and consumer testing to test the appeal of the product and its packaging to consumers. This assists the marketing team to develop marketing strategies to successfully launch the product in the market place.

Evaluation of the production processes

Both the process engineer and the production manager will review all stages of the production. This includes the resources used, the type of ingredients and availability, and other materials required to make the product. Consideration is also given to the suitability of the cooking methods, flavourings and presentation of the food. They also review the technical expertise required to produce the product and whether staff require retraining or additional staff are needed. They evaluate the effectiveness of the production processes and the problems that arose during the scale-up and full production process. It is also important to review the HACCP system to determine if identified hazards were monitored effectively and the corrective actions were successfully implemented.

Evaluation of the economic viability

When a new product is in the development stage, the company will undertake an economic analysis of costs involved in its production. These figures are really a forecast of the anticipated costs of the design and development of the product, and the likely profit if sales meet their target. This process is called a financial feasibility study and is used to determine a 'break-even point' based on the costs of development, marketing, production and number of sales required to make a profit.

This evaluation is based on the projected product life cycle, including production costs and anticipated returns over several years. These figures are reviewed once the development stage has been completed and the product is launched in the market place to ensure that the company can recoup the cost of development of the product.

Initially, the economic returns will be low as the new product finds acceptance among consumers. However, the success of the product in the market place will be critical to maintaining its continued viability in the company's product range. The sales of the product must rise to a level that will cover the development costs, including any investment in new equipment, as well as the cost of raw materials, labour and other overheads.

Data is also reviewed from the information supermarkets collect as food items are scanned through the checkouts. This will include information on the number of products sold per shop, most popular package size of the food product, which supermarket sells the most of the product and whether the food is a seasonal item.

Evaluation of the marketing campaign

The company also evaluates all aspects of the marketing campaign, including the promotional strategies such as television and magazine advertising, social media, promotional displays, any competitions that have been run in conjunction with the product launch, supermarket demonstrations and free samples. Company employees, consumers and industry specialists are all asked for feedback on all aspects of the marketing mix.

The company also undertakes a SWOT analysis of the marketing plan to identify whether minor adjustments need to be made. A key aspect of the SWOT analysis is to evaluate the competition from other manufacturers, determining the strength of the product in comparison with similar products in the market place.



SWOT analysis

Another key aspect of the evaluation of the marketing plan is a review of the target market. An analysis of sales identifies whether the needs of the target market are being met as anticipated. If sales are

below expected levels, these needs may not be being addressed. The product packaging is also evaluated to ensure that it is achieving its aim of protecting the product, as well as being a key feature of the marketing plan.

Establishing sales targets will be one of the important features of the marketing plan. If initial sales rise quickly and stabilise at a level that will ensure a profitable return to the company and meet the target, the company generally maintains the product in its range. However, if the product does not prove to be economically viable, it is unlikely that the company will continue to support the product's promotion. Equally, if for any reason problems arise with the design or in the production of the product, the company may decide to 'kill' the product to protect the reputation of the company and sales of other products in its range.

Understanding the text

21 Draw a flow chart to demonstrate the four stages in the evaluation of a new food product.

22 Explain why a company would undertake a final evaluation of the physical and sensory properties of the new product before it is launched.

23 List four aspects of the production processes that will be reviewed during the evaluation of the product.

24 Why is it important to review the HACCP system when evaluating the production processes?

25 Explain what is meant by the term 'break-even point' when conducting an economic evaluation.

26 Explain how the data a company receives from supermarkets will assist it in its evaluation of a new food product.

27 Suggest reasons it would be important for a company to evaluate all the promotional strategies it has used in its marketing campaign.

28 Identify a type of analysis that could be used to evaluate the marketing campaign.

29 Explain why you think this type of analysis technique will be effective when evaluating the new food product.

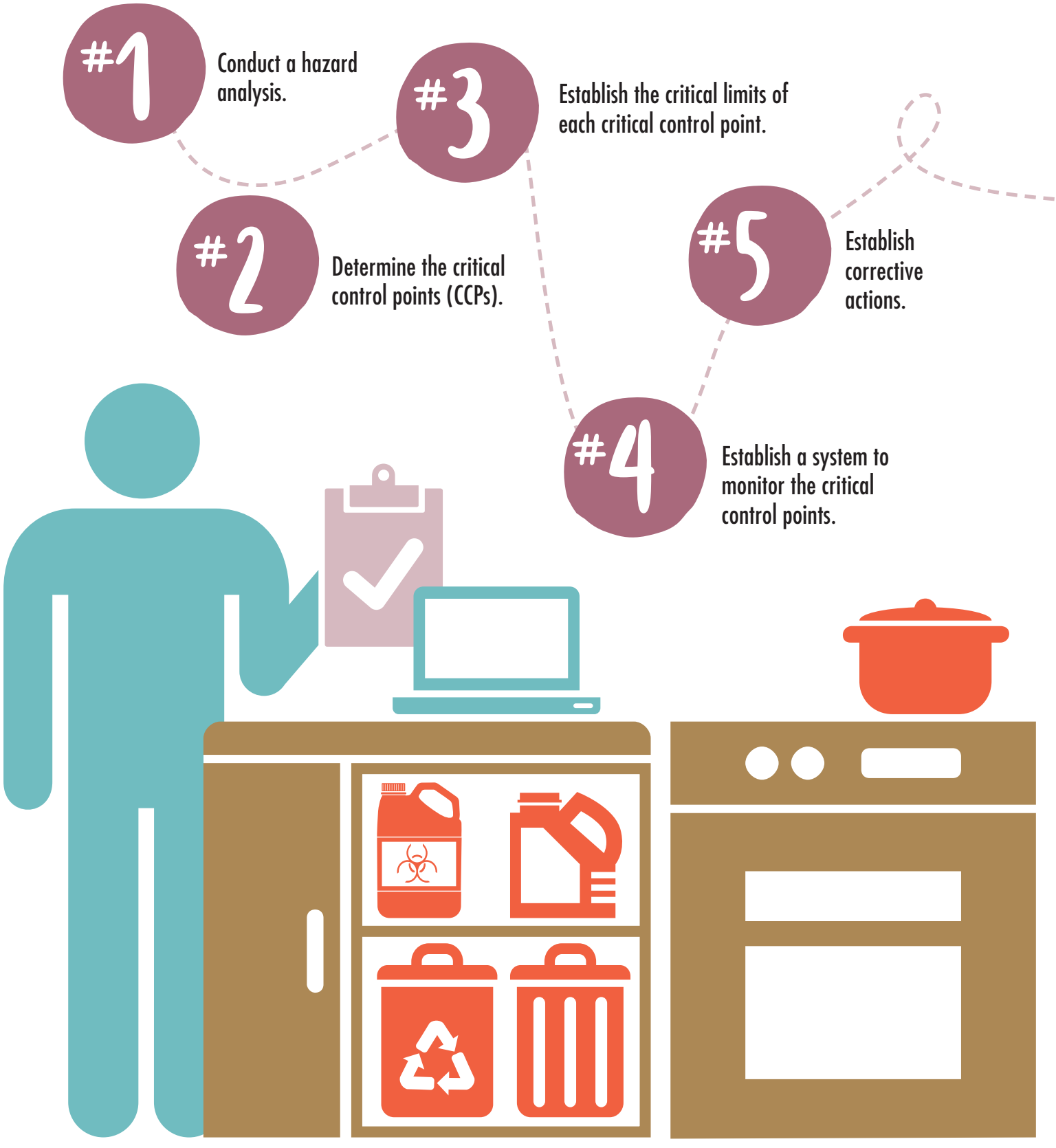
30 Explain why it is important to consider the competition from other manufacturers when reviewing the marketing campaign.

THINKING SKILLS

1 Draw a flow chart to demonstrate the process of food product development. Annotate each stage to highlight the most important feature of each stage of the process.

2 The development of a prototype is a key feature of food product development. Justify the importance to the manufacturer of developing a prototype for a new food product.

STEPS IN A HAZARD ANALYSIS CRITICAL CONTROL POINTS (HACCP) SYSTEM





#6 Verify that the HACCP system is working correctly.

#7 Set up records.

12 FOOD SAFETY

KEY TERMS

Australia New Zealand Food Standards Code is a code developed by FSANZ covering locally grown and processed food which prescribes exactly what every food must contain or may contain; nothing else is permitted in that food.

Department of Agriculture and Water Resources operates at a national level and is responsible for the inspection of imported foods, food exports from Australia and border protection and quarantine.

Food additives are chemicals added to food to keep them fresh or to enhance their colour, flavour, texture or processing properties.

Food product recall is an action taken to remove from distribution, sale and consumption, food that may pose a health and safety risk to consumers.

Food Standards Australia New Zealand (FSANZ) is a partnership between the Commonwealth (federal), New Zealand, state and territory governments to develop and implement uniform food standards.

Hazard Analysis Critical Control Points (HACCP) is a food safety system that identifies potential food hazards and their control points at all stages in the production of food.

Mandatory warning statements are prescribed statements that must be included on the label using the exact words listed in the standard.

Regulating food safety in Australia

One of the most important issues in optimising the health of any community is to establish a safe food supply. In Australia, a framework involving authorities from all three levels of government – national, state and local – has been established to develop and implement a range of stringent regulations and standards to ensure that consumers have access to safe food.



National authorities

- Development of food standards including standards to address food safety issues through:
  - Department of Agriculture and Water Resources
  - Food Standards Australia New Zealand (FSANZ)
  - Food Standards Code



State authorities

- Implementation and enforcement of all food legislation within the state
- Development of food safety regulations using the Food Standards Code as a reference
- Development of food safety program based on HACCP



Local authorities

- Monitoring of all food businesses within the state to ensure they comply with state Health Acts

Overview of roles and responsibilities of national, state and local authorities

National authorities

FOOD STANDARDS AUSTRALIA NEW ZEALAND (FSANZ)

The federal government has the overall responsibility for ensuring a safe food supply for Australian consumers. At a national level, the federal government develops and reviews all legislation in relation to our food supply. It achieves this through its statutory body, **Food Standards Australia New Zealand (FSANZ)**, which is responsible for developing and reviewing the Food Standards Code. Food Standards Australia New Zealand (FSANZ) is a bi-national independent statutory agency that was established by the *Food Standards Australia New Zealand Act 1991*. It is a partnership between the Commonwealth (federal), New Zealand, state and territory governments to develop and implement uniform food standards. The Food Standards Code in Australia and New Zealand is based on world standards of the Codex Alimentarius Commission, a body established by the United Nations and the World Health Organization.

The roles and main responsibilities of FSANZ are to:

- develop food standards for food manufacturing and labelling
- develop codes of practice with the food industry
- coordinate national food surveillance
- coordinate a food recall system
- provide food-handling advice to consumers
- conduct research
- develop Australia-only food standards that address food safety issues:
  - in primary production
  - regarding maximum limits for agricultural and veterinary drug residues.

Goals of FSANZ

One of the key goals of FSANZ is to provide consumers with information about a variety of issues of importance to health and wellbeing to enable them to make informed choices about the foods available for purchase. Consumer information is provided on a range of issues, including food labelling, possible food contaminants, nutritional issues, such as folate in pregnancy, genetically modified foods and irradiation, food allergies, nutrition content claims and health claims, food additives and also advises of any food product recalls.

DEPARTMENT OF AGRICULTURE AND WATER RESOURCES

The **Department of Agriculture and Water Resources** operates at a national level and provides quarantine inspection for all plant and animal goods arriving in Australia. The Department also regulates and monitors the importation of raw foods and manufactured food products into Australia, as well as the export of food from Australia. It is empowered to enforce legislation and can therefore prosecute anyone who breaks the strict regulations regarding the importation of restricted products into Australia.

The Department of Agriculture and Water Resources has the following areas of responsibility:

- imported food inspection
- exports from Australia
- border protection and quarantine.

Imported food inspection

Food that is imported into Australia and New Zealand is subject to the Imported Food Inspection Scheme. The aim of this program is to make sure that all food complies with the requirements of the Australia New Zealand Food Standards Code and is therefore safe to consume. The scheme is jointly run by FSANZ, which develops the risk assessment policy for all food, and the Department of Agriculture and Water Resources, which is responsible for operational issues such as inspection and sampling.

Food that is imported into Australia that is considered to pose a medium to high risk to the health of consumers is inspected and tested each time it is imported until it passes five consecutive tests against a published list of potential hazards, including microorganisms and contaminants. Once it has passed inspection on five consecutive consignments, the inspection rate is reduced to 25 per cent. If the food product passes a further 20 consecutive tests, the inspection rate is reduced to 5 per cent.

Border protection and quarantine

Another key responsibility of the Department of Agriculture and Water Resources is to ensure that Australia's agricultural industries and native environment are protected from the introduction of serious pests and diseases that could have a devastating effect on our community and economy.

On arrival at one of our international airports or seaports, all visitors and residents returning to Australia must declare all food, plant material and animal products for inspection. People carrying any high-risk items can either dispose of them in quarantine bins as they enter the country, or they may declare them to a biosecurity officer.



Alamy Stock Photo/Greg Balfour Evans

Declare it or bin it

One of the most obvious signs of quarantine inspection for international travellers has become the teams of detector dogs that are trained to



Department of Agriculture and Water Resources

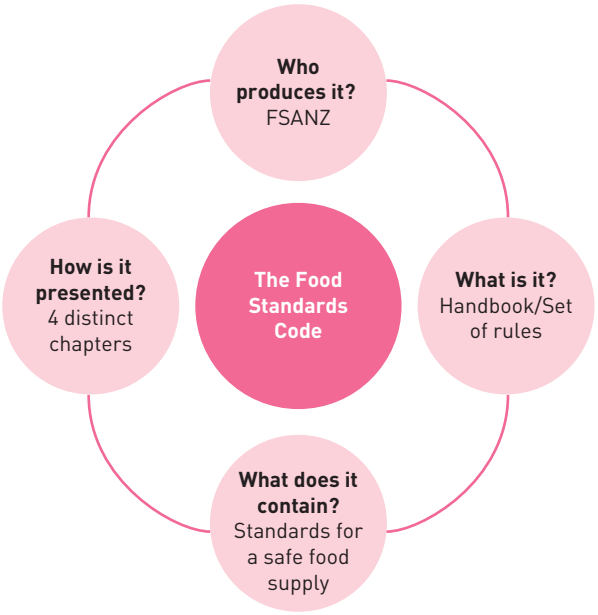
Biosecurity detector dog

detect prohibited imports such as plants or banned food products. This includes dairy products, fresh fruit and vegetables, fresh and processed meat and eggs. Dogs are also trained to work at international mail centres where they check letters and parcels for unauthorised material that might pose a quarantine risk and introduce pests and diseases into Australia.

Australia New Zealand Food Standards Code

One of the main responsibilities of FSANZ is to develop and administer the Australia New Zealand Food Standards Code.

The **Australia New Zealand Food Standards Code** is made up of a series of standards. Food sold in Australia must comply with the food standards in the Code – in Australia it is a criminal offence to supply food that does not comply with the standards outlined in the Code. The Code covers locally grown and processed food as well as imported foods. There are four chapters within the Food Standards Code.



The Food Standards Code

Chapter 1: General food standards

Chapter 1 sets out the standards that apply to all foods. It contains information about:

- definitions relating to the standards
- food labelling requirements

- substances added to food, such as food additives and vitamins and minerals
- contaminants and residues, for example the maximum agricultural and veterinary chemical residues that are permitted in food
- food requiring pre-market approval, for example food produced using gene technology
- microbiological and processing requirements; for example, liquid egg white cannot be sold for use in the manufacture of food products unless it has been pasteurised.

Chapter 2: Food product standards

Chapter 2 contains standards for particular classes of food, including cereals, fruits and vegetables, meat, eggs and fish, edible oils, dairy products, non-alcoholic beverages and sugars and honey.

The standards for each of these classes of foods prescribe exactly what the food must or may contain; nothing else is permitted in that food. The standards include information on the:

- identity of the particular food – describes or defines the food, for example cheese
- composition – describes the make-up of the food, for example the list of ingredients, permitted additives, the minimum nutritional content, the maximum amount of contaminates and residues; for example, as of September 2009, all wheat flour used for making bread in Australia must be fortified with folate and thiamin, and iodised salt must be used in place of non-iodised salt
- microbiological make-up – includes the types and limits of microorganisms permitted, for example the proportion of microorganisms that can be added in the production of yoghurt
- analytical standard – refers to the methods used to measure components of the food, such as fibre content
- additional labelling requirements for specific foods, such as the types of fats.

Chapter 3: Food safety standards

Chapter 3 establishes standards for food hygiene to ensure that only safe and suitable food is sold to consumers. The standards within this chapter apply to Australia only. It includes standards for:

- food safety programs, based on the Hazard Analysis Critical Control Points (HACCP) system
- food safety practices; for example the requirements necessary at all stages of food production, such as storage, processing, packaging, distribution and the recall of food. It also includes requirements regarding the skills and knowledge of food handlers
- food premises and equipment; for example, premises must be designed to minimise food contamination and allow all fixtures and fittings to be cleaned thoroughly
- food service to vulnerable persons; for example, food that is produced for patients in hospital, residents in aged-care facilities and children in childcare centres.

Chapter 4: Primary production standards

Chapter 4 includes standards relating specifically to primary production requirements of food in Australia. This chapter has been developed as a 'whole food chain' approach to ensuring a safe food supply in Australia. The Primary Production and Processing (PPP) standards:

- apply to the primary production sector to ensure that risk-management strategies are developed for the whole food supply chain from producer to consumer
- are based on HACCP principles
- have been developed for various food industries.

Chapter 1	Chapter 2	Chapter 3	Chapter 4
General food standards Standards that apply to all foods labelling	**Food product standards** Standards that describe exactly what a food must contain	**Food safety standards** Standards for food hygiene based on HACCP	**Primary production standards** Standards for the whole food chain, from producer to consumer

The four chapters of the Food Standards Code

Understanding the text

1 Explain the role of the federal government in ensuring a safe food supply for Australia.

2 What are the main responsibilities of the Department of Agriculture and Water Resources in ensuring a safe food supply in Australia?

3 What is the Imported Food Inspection Scheme and how does it ensure that food imported into Australia is safe to consume?

4 Explain what a visitor to Australia must do if they are carrying high-risk plant or animal products into Australia.

5 Identify and describe two key strategies biosecurity staff may use to detect any banned food products travellers may bring in at airports or seaports.

6 Develop a knowledge map of the main responsibilities of FSANZ.

7 Explain why FSANZ feels it is essential to provide information to consumers about food products. List four types of information FSANZ provides to consumers.

8 How does the information in Chapter 1 of the Food Standards Code help ensure a safe food supply?

9 What is the purpose of the standards in Chapter 3 of the Food Standards Code? Give two examples of food safety practices addressed in this chapter.

10 Explain why FSANZ has included standards relating to primary production and how they will contribute to ensuring a safe food supply.

FOOD LABELLING

The Australia New Zealand Food Standards Code includes labelling regulations (Standard 1.2) that apply to food for sale in Australia and New Zealand and food imported into both countries. Food labelling regulations apply not only to food for sale through the retail market, but also to food that is prepared in restaurants, schools and canteens or by catering institutions.

Information that *must* appear on a food label

Food labels carry useful information that helps people make informed choices about the food they select to purchase. All products that are not weighed and packaged in front of the purchaser must have the following information, written in English and clearly visible to the consumer.

LABELLING REQUIREMENTS	PURPOSE OF THE REQUIREMENT
Name of the food	Identifies the product and enables it to be easily recognised. The label must not be misleading.
Identification of packaging premises and job lot	Coded in numbers and/or letters. This identifies products in the case of a food recall.
Name and address of the manufacturer	Address must be shown in sufficient detail to ensure the purchaser can contact the manufacturer directly.
Mandatory warning statements and declaration of any allergens present in the food	Enables consumers who have a particular food allergy or food sensitivity to avoid these products, e.g. nuts, milk, egg, gluten.
List of ingredients	All ingredients listed in descending order by weight. Food additives must be shown in the ingredients list by category and number.
'Use-by' date or 'best-before' date	Applies to foods with a shelf life of less than two years. This enables consumers to eat food while it is in its best condition.
Nutrition and health-related claims	A nutrition content claim or health claim can only be included on a label if it is approved by FSANZ or is supported by scientific evidence.
Nutrition information panel	Must show the amount per serve and per 100 grams.
Characterising ingredient or percentage labelling	The proportion of characterising ingredients must be shown in percentages.
Use and storage	Provides information about the storage and use of the product necessary to protect the health of consumers, e.g. 'refrigerate after opening'.
Country of origin	Identifies where the food was made and/or produced or packaged.
Weight and measure of contents	The weight must be stated in metric units of measurement and the word 'NET' must be included.

Information that *must not* appear on a food label

The following information *must not* appear on a label.

- anything false, misleading or deceptive, such as a picture of a strawberry on confectionery that only contains strawberry flavouring
- any claim that a particular food is able to cure a specific illness or disease
- a claim such as 'vitamin enriched' or 'vitamin fortified' or a comparison of the vitamin or mineral content with any other food
- the word 'health' when used in conjunction with the name of the food
- any statement or claim that the food is a slimming food or has weight-reducing properties.

Information that *may* appear on a food label

The following information *may* appear on a label.

- Bar codes are a useful feature for both food manufacturers and food retailers. They can be scanned to provide food outlets with information about the price, date of manufacture and batch number of the product.
- Serving suggestions help consumers with ideas about accompaniments that could be served with the product or alternative methods of cooking the product.

FOOD ADDITIVES

Most processed foods contain **food additives**, which are chemicals added to food to keep them fresh or to enhance their colour, flavour, texture or processing properties. The more processed a food, the more food additives it is likely to contain.

Before a food additive is approved for use, Food Standards Australia New Zealand reviews evidence about how safe it is for human consumption. Food additives are listed on a food label according to use and number:

- colours – used to add colour to a food or to restore colour lost during processing
- preservatives – help extend the shelf life of food
- antioxidants – slow the rate at which foods 'go off', for example, when fats and oils become rancid
- artificial sweeteners – provide a sweet flavour to food but with fewer kilojoules than sugar
- flavour enhancers – used to improve the flavour or aroma of food
- emulsifiers – enable oil and water mixtures to remain in suspension and not separate
- stabilisers and thickeners – increase the viscosity in foods so that they have an improved consistency.

Food labelling regulations require food processors to list additives on the label of a food product according to its number so that consumers can easily identify any they may be sensitive to and wish to avoid.



Alamy Stock Photo/DVV Images

Additives must be listed on a food label.

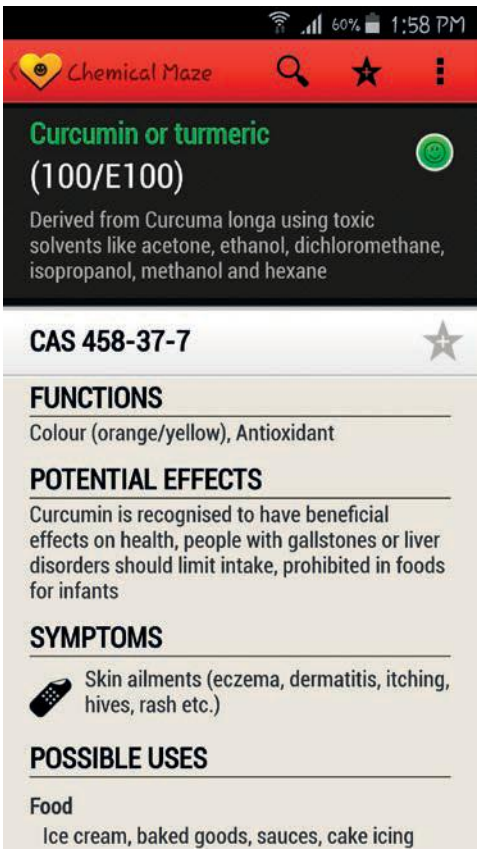


Photo courtesy chemicalmaze.com

Smartphone apps help consumers identify the additives on a food label.

Activity 12.1

Examining the food additives in popular snack foods

Worksheet



1 Select four popular snack foods from the following categories:
   - crisps such as chicken potato chips
   - dry biscuits such as Barbecue Shapes
   - sweet snacks such as Monte Carlo biscuits
   - confectionary such as M&M's, Smarties or Snakes Alive

2 Read the food labels and record the information in a table like the one that follows.

SNACK FOOD	LIST OF ADDITIVES

3 Search online to identify food additives that may be considered harmful by some people.

4 Highlight the additives in the snack foods you have examined that could be considered harmful.

5 Explain why food colours are thought to harm the health of some children.

6 Outline three strategies you could use to minimise the amount of additives you consume.

Food safety standards

FSANZ has developed a series of standards to ensure that food is kept safe by controlling any hazards that could occur in food production or food handling. Standard 3.2.1 – Food Safety Programs is based on the principles of HACCP.

HAZARD ANALYSIS CRITICAL CONTROL POINTS (HACCP)

The **Hazard Analysis Critical Control Points (HACCP)** system (pronounced 'hass-up') is a food safety system that identifies potential food hazards and their control points at all stages in the production of food.

HACCP has become the basis for ensuring that all food is prepared, manufactured and handled safely. In Victoria, Standard 3.2.1 has been legislated as law in the 1997 amendment to the Food Act. This legislation requires that all food premises have a food safety program that outlines the HACCP system to be implemented. The food safety program must be approved by the local health authorities before registration of the business is approved.

Preventing food spoilage and poisoning using HACCP

Although hazardous situations may still arise in the food chain, a system such as HACCP reduces the risk of unsafe food reaching the consumer. The main purpose of the HACCP system is to prevent food spoilage and food poisoning and to ensure a safe food supply for consumers. The HACCP system does this by operating throughout the whole food supply chain, including all areas of primary production, as well as in the food manufacturing and food retailing systems.

The HACCP system enables primary producers and food manufacturers and retailers to:

- examine every stage of production and identify any hazards that may occur
- note each point where a hazard poses high risk – these are noted as critical control points
- take steps to prevent, remove and reduce hazards
- closely monitor the critical control points in the HACCP system at regular intervals to ensure safety control procedures are being carried out
- monitor the steps where serious problems occur and address the problems as they arise.

Steps in the HACCP system

1 Conduct a hazard analysis – hygiene and food production safety hazards need to be identified, such as potentially hazardous ingredients, for example eggs or chicken. Other possible hazards include cooking or holding temperatures for the food or the use of chemical cleaning agents in the production process.
2 Determine the critical control points (CCPs) – the critical control points during each stage of manufacture must be identified. Critical control points are the points at which important things can go wrong in relation to temperature control and sanitation.
3 Establish the 'critical limits' for each critical control point – this varies for each business, but includes both minimum and maximum limits, for example the acceptable temperature within which foods should be cooked or chilled.
4 Establish a system to monitor the critical control points – a process for systematically checking that the critical limits are not exceeded must be established. Observations or measurements must be taken and recorded on a regular basis.
5 Establish corrective actions – identify the actions that are to take place if a problem occurs. These actions are intended as a safeguard and may require more than one corrective action, for example food being discarded and/or staff retrained.
6 Verify that the HACCP system is working correctly – the system must be reviewed on a regular basis, including as part of an annual independent audit. The outcome of the reviews must involve amending and updating the system as required. During the verification process, the business needs to check that there is improvement in the end product. Microbiological testing could indicate the microorganism count is in the target range, sanitation procedures have improved or food-handling practices have changed.
7 Set up records – accurate and reliable records of results must be kept for auditing and to check for improvements.

Activity 12.2

Identifying potential critical control points in food processing

Chicken and chilli noodle stir-fry is one of the most popular dishes with customers at a local noodle bar. The following ingredients are used in the preparation of this dish.

Chicken and chilli noodle stir-fry

Worksheet

Ingredients

250 grams fresh egg noodles
1 tablespoon oil
1 fresh chicken breast, thinly sliced
1 clove garlic, crushed
1 small red chilli, finely chopped
1 onion
½ red capsicum, thinly sliced
½ carrot, thinly sliced
½ bunch bok choy, sliced
½ teaspoon five spice powder
1 tablespoon soy sauce
1 tablespoon oyster sauce
1 tablespoon honey


Getty Images/Photostock Israel

Chicken and chilli noodle stir-fry

Complete the table on the following page, identifying the potential hazards that could occur at each stage of food processing of the chicken and chilli noodle stir-fry. Suggest appropriate corrective actions that would need to be implemented to overcome these hazards.

HACCP SYSTEM FOR THE PRODUCTION STEPS FOR CHICKEN NOODLE STIR-FRY		
PRODUCTION STEP	**POSSIBLE HAZARDS AT CRITICAL CONTROL POINTS**	**CORRECTIVE ACTION**
Freshness of raw ingredients • chicken • fresh egg noodles		
Storage of ingredients • raw chicken • perishable ingredients – fresh egg noodles, vegetables • non-perishable ingredients – five spice powder, honey, oyster and soy sauce, oil		
Preparation of ingredients • personal hygiene • preparation of chicken and vegetables		
Cooking • time		
Storage • hot-holding time in a bain marie • chilled storage		
Reheating for hot service		

Understanding the text

11 What is a mandatory warning statement and why are some food products required to include these warnings on their labels? Give an example to support your answer.

12 Explain the difference between the list of ingredients and a nutrition panel on a food label, and why both are required by law.

13 Why is a 'best-before' or 'use-by' date included on a food label? Explain how this information is an advantage to consumers.

14 What are the benefits to consumers of percentage labelling?

15 What are food additives? List three types of food additives commonly used in processed food and explain why they are used.

16 Explain why the HACCP system is an essential feature of all food safety programs.

17 How does a HACCP system benefit primary producers, food manufacturers and retailers?

18 Why would a company need to analyse the hazards in a food production system?

19 Explain the three main steps in the HACCP system that the company would need to follow once hazards have been identified.

20 Explain how a company could verify whether its HACCP system was working correctly.

State authorities

State and territory governments throughout Australia have two key responsibilities in relation to all national food legislation:

- implementation
- enforcement.

They are required to make sure that the food standards developed by FSANZ are implemented by becoming law in their state.

In 1984, the Victorian Government introduced legislation in the form of the *Food Act 1984*, which outlined the legal responsibilities of all food manufacturers and retailers in Victoria to ensure a safe food supply. This Act, and amendments to the Act in 1997, 2001 and 2009, are the means by which the FSANZ Food Standard Code is applied as law in Victoria. The *Food Act 1984* covers all food premises that manufacture, package, transport or sell food in the state, including restaurants and takeaway food outlets.

IMPLEMENTING AND ENFORCING FOOD SAFETY LEGISLATION IN VICTORIA

Within Victoria, the Department of Health and Human Services Food Safety Unit is the authority responsible for implementing the Food Act. Its major responsibilities include:

- developing guidelines to assist food businesses to prepare a food safety program before they can register their business
- approving all food safety auditors and food analysts who will review the food safety program of food businesses
- overseeing any food contamination or food poisoning incident within the state
- issuing 'closure orders' against a food premise if a food contamination or food poisoning incident occurs
- appointing food recall action officers should any food product need to be recalled
- notifying municipal councils of any food recalls
- providing advice on policy matters to local governments relating to food safety and food safety regulations.



Implementation of food safety in Victoria

Local authorities

Local municipal councils are at the 'grass-roots' level of ensuring the safety of our food supply. They are responsible, on a daily basis, for monitoring the implementation of the Food Act within their local area.

The major responsibilities of municipal councils include:

- employment of environmental health officers
- registration of food businesses, including the approval of a suitable food safety program
- inspection of all food premises on an annual basis before the business can apply for re-registration
- follow-up of 'closure orders' and ensuring food premises are cleaned up in cases where there has been a food poisoning incident
- enforcement of food product recalls and overseeing of the destruction and disposal of recalled food
- education of food retailers and their employees in best practice to safeguard the quality of food sold
- requirement for environmental health officers to take food samples within their local municipality to assess compliance with microbiological, chemical and nutritional standards. Samples are also taken to assess any food about which there has been a complaint. The samples are taken from any premises involved in the food industry, including food manufacturers and retailers, hospitals and childcare facilities in their area
- registration of all mobile food vehicles that are used to manufacture, heat, prepare or sell food, for example ice-cream vans or hot-dog and pie vans

- issuing of permits for all temporary food stalls at public events, including community markets, special open-air events, fetes, street stalls and cultural festivals.

Food industry safety programs

One of the key responsibilities of any government, whether within Australia or internationally, is to ensure that its population has access to a safe food supply. In Australia, legislation has been developed to ensure that food is produced and sold in a safe and clean environment. However, if an incident occurs along the food supply chain that is likely to cause a risk to public health and safety, policies are in place to remove such a risk.

Each of the three levels of government has defined roles and responsibilities and must take particular action so that the safety of our food supply is ensured, including:

- the development and implementation of a food safety program for food premises
- responding to unsafe and/or unhygienic food production premises
- a food product recall.

FOOD SAFETY PROGRAM

One of the most important means of ensuring a safe food supply is to guarantee that the premises in which food is to be produced are clean and hygienic. National, state and local authorities all have key roles in developing, enforcing and monitoring legislation so that new food premises are established and operated safely and hygienically.

A food safety program is a document prepared by a food manufacturing company that outlines how it will manage the production of its food products so that they are safely prepared, served, manufactured or sold.

A food safety program contains information on:

- personal hygiene of employees
- safe food handling
- cleaning of equipment and premises
- pest control
- the monitoring of temperatures throughout all stages of preparation and processing
- procedures to manage food safety hazards.

RESPONSIBILITY	ACTION
National: FSANZ	
Development of food safety standards	• FSANZ has developed Food Safety Standard 3.2.1 to ensure that all food produced for sale in Australia is safe for consumption. • FSANZ has developed national criteria for the approval of food safety auditors.
↓↑	
State: Department of Health and Human Services (DHHS)	
Development of guidelines for preparing a food safety program	• A food business must complete a food safety program before it can register and operate its business. • The DHHS develops guidelines for a food safety program for all food premises that manufacture, package, transport or sell food. • The food safety program must be based on the principles of HACCP.
Establishment of qualifications for food safety supervisors	• The food safety program requires that each business has a food safety supervisor who must have minimum qualifications demonstrating knowledge and competency in food safety.
Auditing of food safety programs	• The DHHS ensures that all people approved to act as food safety auditors or food analysts have appropriate qualifications to carry out these roles. • The DHHS has established guidelines for auditors to follow when they review the food safety programs of food businesses.

	
Local: Municipal councils	
Employment of environmental health officers	• Local councils are responsible for the employment of environmental health officers who are responsible for the inspection of the premises and the proposed food safety program on behalf of the council.
Registration of food businesses	• All businesses wishing to manufacture, package or sell food within their municipality must apply to register a food business. • Before the local council registers a business it must ensure that the business has an approved food safety program, including the appointment of a qualified food safety supervisor. • The food safety supervisor must have appropriate qualifications and/or experience and the ability to supervise other staff in food preparation.
Inspection of all food premises on an annual basis	• All food premises must apply to their local council to have the registration of their food premises renewed on an annual basis. • The renewal is based on an annual inspection of the premises and a review of the food safety program by the environmental health officer.

SYSTEM FOR RESPONDING TO A FOOD POISONING INCIDENT

Very occasionally, food can be contaminated during preparation and this can lead to food poisoning incidents. This could, for example, involve a restaurant or food manufacturer that has poor food-handling practices, leading to cross-contamination or perhaps contamination by rodents. Regardless of the cause, national, state and local authorities must each take action to address the unsafe or unhygienic food premises.

RESPONSIBILITY	ACTION
National: FSANZ	
Development of food safety standards	• FSANZ has developed Food Safety Standard 3.2.1, based on the principles of HACCP, to ensure that all food produced for sale in Australia is safe for consumption. • FSANZ has developed criteria for the approval of food safety auditors in all states and territories.
	
State: Department of Health and Human Services (DHHS)	
Overseeing all food poisoning incidents	• All incidents of food poisoning or unsafe or unhygienic food premises are reported to the DHHS. • Staff from the DHHS oversee all food poisoning incidents or reports of unsafe or unhygienic food premises within the state.
Analysis of food samples	• Staff from the DHHS work with local environmental health officers to analyse food samples to determine the source of the food poisoning incident and any food preparation procedures that could have contributed to this.

Issuing 'closure orders'	• The DHHS issues a 'closure order' against food premises if found to contravene the *Food Act 1984*. This means that if a food contamination incident occurs, the food manufacturer or food retailer, such as a takeaway food outlet or restaurant, can be ordered to close by the DHHS until the premises are cleaned and the source of the food poisoning is isolated and removed.
	
Local: Municipal councils	
Follow-up of a 'closure order'	• Local government follows up on the 'closure order' issued by the state government through the DHHS to close a food business associated with a food poisoning or food contamination incident.
Inspection of premises	• The council is responsible for taking action to ensure the premises are cleaned up and meet the requirements of the food safety program.
Re-registration of the food business	• The food business must present an amended food safety plan. Local council will reissue a Certificate of Registration for the food premises once they are satisfied that the issues associated with the food poisoning or food contamination incident have been addressed.

FOOD PRODUCT RECALL SYSTEM

FSANZ defines a **food product recall** as 'action taken to remove from distribution, sale and consumption, food that may pose a health and safety risk to consumers'.

Food product recalls are usually a result of a report to FSANZ from food manufacturers or wholesalers, government agencies such as health authorities that undertake testing, medical practitioners or consumer complaint.

The primary responsibility for food product recalls lies with the food manufacturer or food importer.

Some examples of food products that have been recalled include:

- food that has been incorrectly labelled; for example, the original label may not indicate that it contains ingredients to which some consumers may be allergic, such as nuts or gluten
- a batch of food that contains a contaminant, such as metal fragments, plastic or glass
- food items such as processed meat that may be contaminated with a bacterium such as Salmonella
- food that has been chemically contaminated
- food for which a problem has arisen during processing, for example, UHT milk that has not been heated to the correct temperature, or canned foods that have not been correctly sealed or sterilised.

Like all other products that are recalled from the market place, food product recalls must include specific information to assist consumers to identify the product.

FOOD RECALLS

WHO DOES WHAT?

Industry and government work together to ensure food that may pose a risk to public health and safety is recalled quickly. Below is a summary of who does what:

THE FOOD BUSINESS

- Notifies government that a recall is needed.
- Notifies its business customers that the food needs to be recalled.
- Communicates the recall to the public.
- Provides Information to Food Standards Australia New Zealand about the food being recalled.



STATE & TERRITORY GOVERNMENT

- Confirms that a recall is needed.
- Provides assistance to businesses recalling food.
- Checks that the food business is effectively recalling the food.

FOOD STANDARDS AUSTRALIA NEW ZEALAND

- Coordinates recalls in consultation with the business & state/territory government.
- Obtains information about the recall from business.
- Communicates the recall to government, industry and international government contacts.
- Publishes the recall on the FSANZ website and social media.

For more information on food recalls visit **www.foodstandards.gov.au**

FOOD STANDARDS Australia New Zealand
Te Mana Kounga Kai – Ahitereiria me Aotearoa

Food Standards Australia New Zealand

Who does what in a food recall?

RESPONSIBILITY	ACTION
National: FSANZ	
Development of food recall standard	• FSANZ has developed Food Safety Standard 3.2.2 to ensure the recall of unsafe food.
Development of recall protocols	• Food product recalls are based on guidelines produced by FSANZ called the 'Food Industry Recall Protocol'.
Coordination of food product recalls	• FSANZ has the overall responsibility for coordinating food product recalls within Australia (but not in New Zealand). • FSANZ liaises with the food manufacturer and state and territory authorities to gather and collate all information about the recall.
	
State: Department of Health and Human Services (DHHS)	
Appointment of food recall action officers	• The DHHS must appoint a food recall action officer who will oversee the recall of food products within the state. • The food recall action officer may request FSANZ coordinate a recall for a particular food product within the state if they receive information from a food manufacturer that a food recall is required.
Mandatory powers to recall	• State and territory governments have mandatory powers to legally recall food products if a severe health and safety risk arises.
Monitoring recalls	• The DHHS monitors the effectiveness of food recalls and provides scientific, technical and operational advice.
Notifying municipal councils	• The DHHS notifies municipal councils of any recalls requiring action.
	
Local: Municipal councils	
Enforcement	• Local councils enforce food product recalls in conjunction with information provided by the state government.
Oversee disposal of recalled food	• Environmental health officers may be involved in overseeing the destruction and disposal of recalled food. • They may issue a statement to certify that the food has been destroyed.

Activity 12.3

Food product recall

Worksheet

Read the food recall notice and answer the questions below.

1 Identify the following features of the notice:

FEATURES	
the type of recall	
the name of the product being recalled	
how the recalled product can be identified by consumers	
the reason for recalling the product	
the potential hazard the product poses to consumers	
what the consumer should do with the recalled product	
how the consumer can make contact with the company if necessary	
information about other products that might be affected	

2 Based on the information above, develop a list of information that a company would be required by FSANZ to include in any food product recall.

FOOD RECALL

LITTLE POSSUM BABY APRICOT and APPLE PUREE (150 mL), BEST BEFORE 20/6/17

Green-a-way Health Foods Australia is undertaking a precautionary recall of the above product.

A small batch of this product was incorrectly labelled and consequently does not declare the presence of egg and milk.

The recall applies only to Little Possum Baby Apricot and Apple Purée, batch code CA 65772, best before 20/6/17.

Customers are asked to return the product to the point of purchase for immediate full refund.

A customer care line has been established. If customers have any concerns or queries about this product, they can call 1800 662 221 113.

Green-a-way Health Foods Australia apologises for any inconvenience.

Activity 12.4

Lettuce recall: more cases of salmonella poisoning linked to salad mixes

Worksheet

Read the article at the bottom of the page then answer the questions below.

1. Evaluate the validity of this news article. Consider the reliability of the sources of information used in the article, the context and presentation of evidence.
2. Outline the reason for the recall of the lettuce products.
3. Based on the information in this chapter, explain Tripod Farmer's role in recalling its products from sale.
4. What does the article identify as the cause of the food poisoning outbreak? How would this source of contamination be transferred to lettuce products?
5. Outline the responsibilities of the Department of Health and Human Services in this food poisoning incident. Refer to the information in this chapter to answer this question.
6. Explain why consumers in other states may also have been affected by this food poisoning incident, not just Victorian consumers.

LETTUCE RECALL: HEALTH EXPERTS WARN OF MORE CASES OF SALMONELLA POISONING LINKED TO SALAD MIXES

Health experts are on the alert for more incidents of salmonella poisoning following a spate of cases in Victoria and a national recall on some lettuce products.

Fifty-four people in Victoria have been diagnosed with having a rare strain of the bacteria and two were hospitalised after eating leafy greens linked to Tripod Farmers, based in Bacchus Marsh, west of Melbourne.

Queensland Health is investigating whether eight cases of a rare strain of salmonella are linked to interstate pre-packaged lettuce.

South Australia is investigating seven suspected cases.

Tripod Farmers has withdrawn 30 products from supermarket shelves and is investigating the salmonella source.

Weight-loss company Lite 'n Easy said some lunches on its menu were affected and customers were being contacted.

It said it had taken steps to replace its lettuce supplier.

Victoria's Department of Health and Human Services senior medical adviser Dr Finn Romanes said he expected more people to develop symptoms in the coming days.

The Department said it was confident the issue was contained, but would continue to investigate the source, along with the company and the local council.

Tripod Farmers has recalled its affected products from major supermarkets in all states and territories, except Tasmania and Western Australia.

The outbreak is believed to be linked to a fertiliser sourced from chickens and used to grow the lettuce.

Food Safety Information Council spokeswoman Lydia Buchtman said it would take time to trace the source of the salmonella.

'It could be a number of things – the irrigation water, the water the lettuce is grown with, it can be something in the washing process,' she said.

'It can be someone who's ill who's actually handling the food.'

The peak body for vegetable growers, Ausveg, defended the industry's quality assurance system and the farmers whose lettuce products were recalled.

It reassured consumers that fresh produce from Tripod Farmers had been cleared as safe to eat.

'Tripod Farmers have been investigated by the Department of Health and Human Services yesterday, and they found their system to be top notch and they cleared them for production and distribution.'

Australian National University epidemiologist Professor Martyn Kirk said Australia had one of the highest rates of salmonella in the industrialised world.

'The mass production of foods has led to the potential for the industrial scale of contamination,' he said.

'So if there is a vegetable or a fruit that's been contaminated with salmonella, it can cause relatively large outbreaks to occur even in states quite some distance.'

Richard Bennett from Fresh Produce Marketing Australia New Zealand said people's expectations over food had changed.

'We expect greater convenience, we expect greater shelf life, we eat out a lot more,' he said.

'We expect everything available everywhere at any time and so the food web is having to respond and that may well be the cause of an increase in salmonella.'

ABC News, 5 February 2016

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Understanding the text

21 Why did the Victoria Government introduce the *Food Act 1984* and make amendments in 1997, 2001 and 2009?

22 Outline three major responsibilities of the Department of Health and Human Services in relation to ensuring a safe food supply in Victoria.

23 List three actions an environmental health officer may be required to take within their local municipality.

24 Outline the responsibilities of national and state authorities if a takeaway food outlet wishes to open a new store.

25 What are the steps a food business needs to take each year if it wishes to continue to manufacture, package or sell foods?

26 What is the meaning of the term 'closure order' and which level of government is responsible for issuing such an order?

27 Why is it important for the DHHS to analyse food samples if a food poisoning incident is reported to them?

28 Outline two responsibilities of local authorities if a food premise is issued with a 'closure order'.

29 Outline the responsibilities of FSANZ in the recall of food products.

30 Explain one role of a state government and municipal council in recalling a food product from the market place and the action they are required to take.

THINKING SKILLS

1 Prepare a knowledge map of the roles and responsibilities of the federal government in ensuring food safety in Australia.

2 Explain what action a local environmental health officer would take if they received a complaint from a consumer who had purchased a box of oatmeal from a local supermarket and found it to be contaminated with weevils.

DESCRIBING FOOD

YUM!

APPEARANCE

SENSE

- Sight

WORDS

- Dark
- Pale
- Bright
- Oval
- Irregular



AROMA

SENSE

- Smell

WORDS

- Strong
- Weak
- Burnt
- Fruity
- Citrusy



FLAVOUR

SENSE

- Taste

WORDS

- Sweet
- Savoury
- Salty
- Hot
- Mild



13

SENSORY EVALUATION OF FOOD

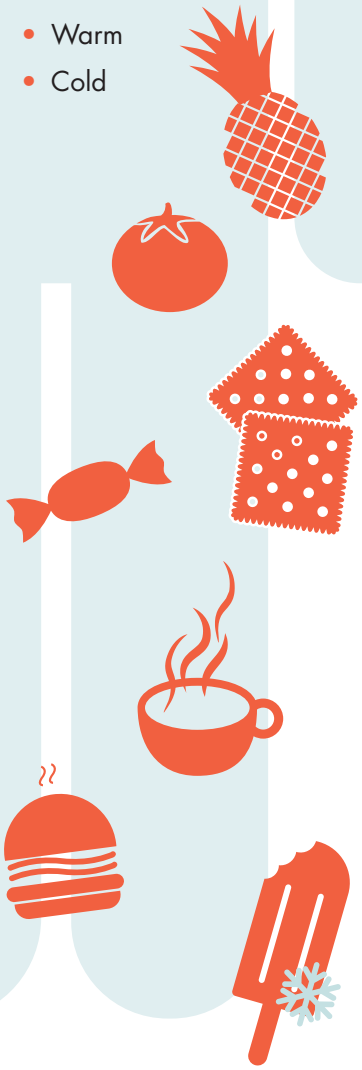
TEXTURE

SENSE

- Touch

WORDS

- Sharp
- Smooth
- Dry
- Chewy
- Hot
- Warm
- Cold



KEY TERMS

Meal solutions are ingredients or pre-prepared products that can be combined to form a meal.

Mouthfeel is the way the food feels against the skin on the inside of the mouth.

Organoleptic refers to the sensory properties of food such as appearance, aroma, flavour and texture.

Qualitative or sensory analysis involves sensory tests that are used to rate and/or rank the organoleptic or sensory properties of food such as appearance, aroma, flavour and texture.

Quantitative tests are scientific techniques that can be used to measure features such as size, height, weight, volume, texture, colour, viscosity, shelf life, gel and nutrient content.

Umami is usually described as a savoury, meaty or 'moreish' flavour; it is often described as the fifth taste.

Sensory evaluation of food

Types of food/quality of ingredients

↓

Chemical and physical changes during cooking

↓

Sensory properties of food – appearance, aroma, flavour and texture

↓

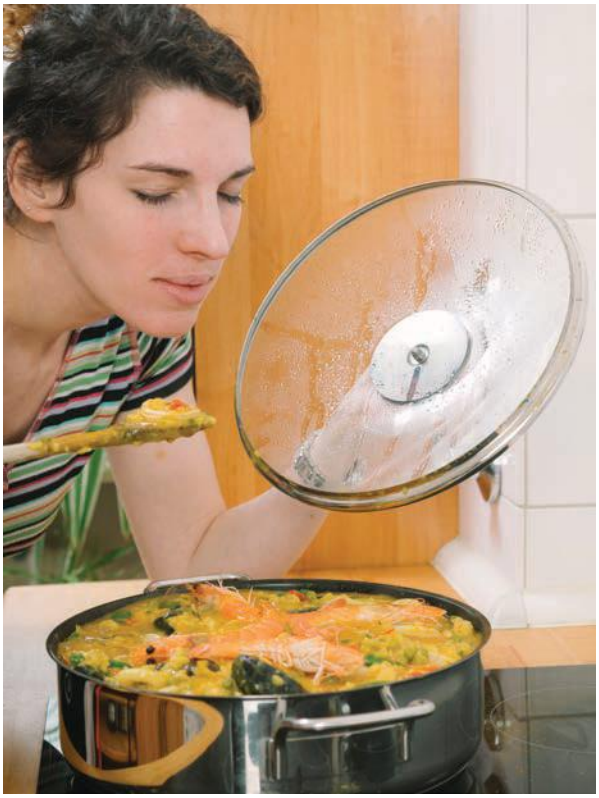
Perceptions of food we eat – emotions, memories, associations

Considerations that influence the senses and our reaction to food

Using all of your senses – sight, smell, taste, touch and hearing – is essential when preparing and cooking food. While the physical actions of cooking, that is, combining ingredients and applying heat, are very important, the skill of the cook is in using their senses to create food that looks and tastes great. Your sense of smell is very useful as it tells you when changes are occurring during the cooking process. For example, the aroma of fresh bread is most intense when the loaf is done and ready to be removed from the oven – the Maillard reactions and dextrinisation produce the delicious aroma. When the flavouring ingredients of garlic, chilli and fresh ginger hit a hot wok, the intense aromatics develop after about 30 seconds and the cook learns that it is time to add the next ingredients in the stir-fry. Another example is that when the golden colour of a sugar syrup develops, the changing aroma indicates to the cook the stage of caramelisation has been reached and it is time to add the cream for a caramel sauce.

Emotions and memories play an important role in the food we eat. The rich, creamy, smooth texture and flavour of chocolate makes eating it a pleasurable experience for many people. As a result, chocolate is often given as a celebration gift and so it is linked to happy experiences. We might look forward to the coffee we are about to make and drink because the complex aromas that flow when we open a new packet of ground coffee remind us of the time we last time opened a packet.

Sensory evaluation is the analysis of the **organoleptic** properties of food – appearance, aroma, flavour and texture.



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Learning to smell the aroma of food builds the skills of a cook.



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Eating chocolate is a pleasurable experience for many people.

Appearance

The first impression we gain about a particular food and whether we think we will enjoy it is based on what it looks like to us. We select foods that look good to us, such as a bright, shiny red apple, but reject those that don't, such as an apple that has a bruised skin. In fact, about 55 per cent of our decisions on whether to eat food is based on its visual appearance, so appearance is an extremely important sensory property.



iStock.com/zeljkosantrac

The sizzling sound and the aromas coming from the hot wok provide information to the cook.



iStock.com/hdere

A fresh apple with bright, shiny red skin has an appealing appearance.

Appearance is composed of a range of components, including colour, shape, size and surface texture. Colour is a key aspect of appearance – we think that a bright red strawberry will have a more intense flavour than one that is pale or partly green in colour. Summer oranges with a naturally green tinge



iStock.com/Ilza

Summer Valenica oranges are sweet and juicy.

to their skin are not our first choice even though the ones with a strong orange colour have been stored for six months so they aren't juicy or have the freshest flavour. Food producers also know that consumers prefer even-sized and shaped fruit and vegetables rather than those that are excessively large or very small. The surface texture is another aspect of appearance that can influence our perception of food. Some people dislike the feel of the skin of fruit if it is 'furry' to touch, such as some varieties of kiwi fruit, so will reject them just by looking at them.



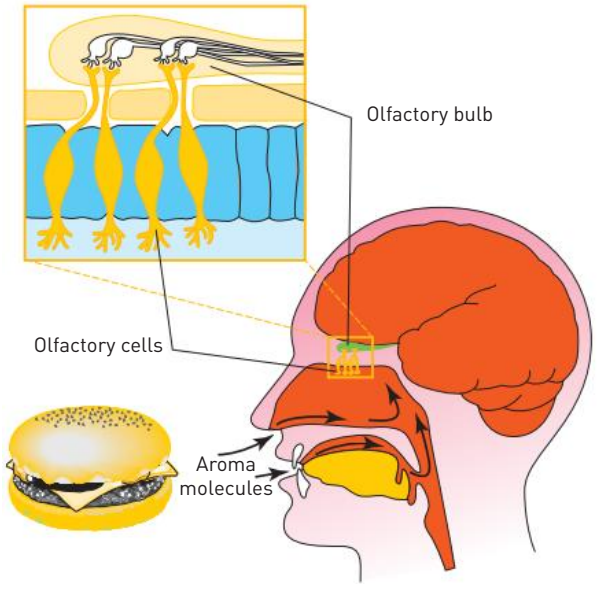
iStock.com/kurmyshov

Kiwi fruit have a textured, slightly hairy skin and smooth, moist flesh.

Aroma

The smell or aroma of a food is a very important component in our enjoyment of that food. While we can detect only four main flavours, it seems we can differentiate between the smell of thousands of different types of food. Food is made up of hundreds of volatile chemicals, which must escape from the food for us to be able to smell them. They evaporate into the air and are breathed into the nose where they reach the olfactory cells at the back of the nasal cavity.

Some cooked food has a stronger aroma than fresh food because more of the volatile chemical molecules from the food are released into the air and are then drawn into the olfactory cells of the nose. For example, warming spices such as cinnamon, cloves, cumin and vanilla strengthens their distinctive aroma and makes them more pungent. Cooking cabbage intensifies its aroma as the sulphur compounds are altered and strengthened. On the other hand, the fresh cut, grassy aroma of many green vegetables reduces with cooking as the enzymatic reactions cease, altering the chemicals within the food. If our nasal passages become blocked when we have a cold, we often think that our food is tasteless because the volatile flavour chemicals cannot reach the olfactory cells at the back of the nose.



Olfactory cells in the nose

Flavour

Even though people may make an initial decision about a food based on its appearance, what they will usually remember is its flavour. The flavour of food is the total impression we form about food and is made up, not only of the basic tastes of sweet, sour, bitter and salty, but also the smell or aroma of the food, as well as appearance and even the sound of food as it is eaten.

Our ability to detect the flavour of food starts even before food is placed in the mouth. The chemicals in the food are given off as aromas and these are detected by the olfactory cells in the nose. When food



Top to bottom: Shutterstock.com; Jfunk; Maks Narodenko; kaiskynet; Peter Zijlstra

Basic flavours that most people can taste

is placed in the mouth, the flavour chemicals present in the food are almost instantly dissolved by the water present in the saliva in the mouth. Simultaneously, the nerve endings in the skin throughout the mouth detect the temperature of the food, making us shudder if it is freezing cold, or open our mouth to let the air cool the food if it is burning hot.

When we taste food we usually concentrate on the four basic tastes of sweet, sour, bitter and salty. However, researchers now say that there is a fifth taste called **umami**, which is also important to how we taste food. Umami is usually described as savoury, meaty or 'moreish' and was first detected in stock made from seaweed in Japan. It is also detectable in tomatoes, oranges and parmesan cheese. Today, the umami flavour is generally created artificially by using monosodium glutamate (MSG).

Activity 13.1

WS Worksheet

What can you smell?

Aim: To use the sense of smell to identify ingredients used in food preparation

Method

1. Set up six paper or plastic cups and six pieces of gauze, cheesecloth or Chux cloths that are big enough to cover the cups and hold them in place with elastic bands.
2. Place a sample of six of the following items – one per cup – and cover:
   - almond essence
   - chocolate chips
   - coffee beans
   - crushed garlic
   - ground spice such as cinnamon, cumin or ginger
   - fresh herb such as rosemary, chopped
   - lemon wedge
   - orange peel
   - soy sauce
   - tea leaves
   - parmesan cheese
   - rose petals.
3. Label each cup with a number.
4. Each tester smells the contents of the cups without lifting the covers and records their guesses on the results table that follows.



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Rosemary has a strong aroma.

Results

SAMPLE	TESTER'S GUESS	IDENTIFICATION OF SAMPLE
1		
2		
3		
4		
5		
6		

After everyone has recorded their guesses individually, discuss the guesses in small groups before revealing the contents of each sample.

Analysis

1. Why were the samples covered for the smell test?
2. Which samples did the majority of the class guess correctly? Why do you think this was the case?

3 After your small group discussion on the sensitivity of individuals' capacity to smell a range of items, explain why the sense of smell is a useful tool when preparing and cooking food.

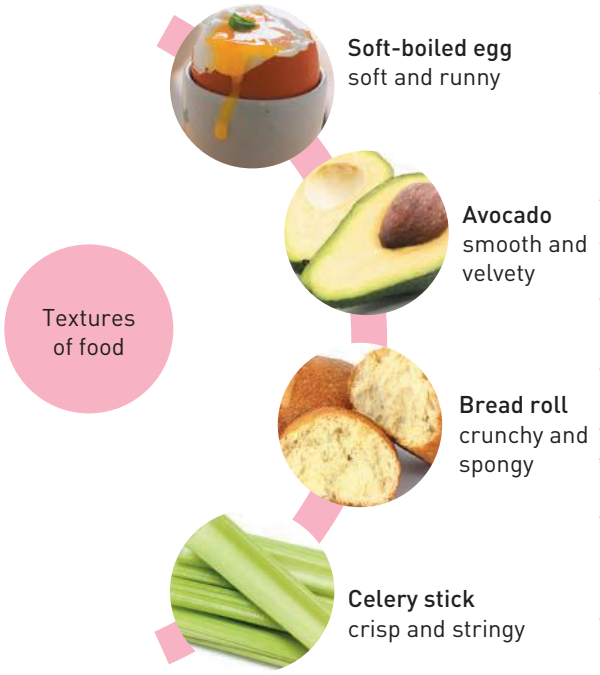
Conclusion

Which food items were easiest for testers to identify using their sense of smell? Justify your answer.

Texture

When we first look at food we can gain an idea of what it might feel like in our mouth based on the appearance of the texture of the food – if the food is smooth, rough, soft or runny. But it is not until we bite into the food or chew it that we can sense how it feels against the skin on our tongue and in our mouth. Celery has a crisp and stringy texture, shortbread might feel crumbly, fresh bread will feel soft in your mouth, while an egg custard might feel thick and smooth. The way food sounds is also important in how we perceive texture – for example, we all know the small explosion you hear if you bite into a crisp apple.

Mouthfeel is the way the food feels against the skin on the inside of the mouth. It is usually made up of the texture of the food, the amount of liquid and air it contains, and its fat content. Depending on the level of each of these components, food might, for example, feel smooth, creamy, rough or airy.



Top to bottom: iStock.com/haoliang; Shutterstock.com/Nataliia K; BW Folsom; Diana Taliun

The texture of food is a good indicator of quality.

Describing food

Trying to describe the difference between foods is often quite difficult. A person evaluating a food product needs to consider the effect the food has on all of their senses – what it looks like, what it smells like, the taste of the food, what the food feels like when they put it in their mouth and even what it sounds like. Sensory descriptors like those in the table that follows may help you to describe food.

SENSORY DESCRIPTORS		
SENSORY PROPERTY	**SENSE USED TO DETECT PROPERTY**	**DESCRIPTIVE EXAMPLES OF THE PROPERTY**
Appearance	Sight	Colour – light, dark, golden, pale, translucent, clear, transparent, shiny, dull, glossy, speckled, white, bright, vivid Shape – oval, round, square, rectangular, irregular, half moon Texture – curdled, runny, lumpy, foamy, smooth, rough, prickly, greasy
Aroma	Smell	Pungent, aromatic, strong, weak, burnt, spicy, yeasty, fruity, sweet, sugary, citrusy
Flavour	Taste	Sweet, sour, bitter, salty, acidic, spicy, hot, mild, strong, weak, sharp, smooth, savoury, chocolate, citrusy, garlic, ginger, mint, fruity
Texture	Touch	Mouthfeel – sharp, smooth, soft, crunchy, firm, greasy, juicy, moist, watery, dry, chewy, rough, tender, tough, oily, waxy, spongy, crumbly, flaky, lumpy, gritty, coarse, velvety, granular, sticky Temperature – hot, cold, warm, cool, sizzling
Noise	Sound	Crisp, crunchy, bubbling, crackling, fizzing, slurping, popping, dull

Understanding the text

1 Identify factors that influence the senses and our reactions to food.
2 Why is the appearance of food so important to our enjoyment of food?
3 Explain how the appearance of fresh fruit and vegetables can be an indicator of quality.
4 Why is the aroma of cooked food often stronger than of raw food?
5 Explain why the sense of smell is useful to a person cooking food.
6 Provide a cooking example, not used in the text, of when the sense of smell indicates a stage in cooking is complete.
7 Briefly describe the way in which we are able to detect the flavour of various foods.
8 What is the umami flavour and how is this flavour created by food manufacturers?
9 Define the term 'mouth-feel'. Why is it an important consideration in the enjoyment of food?
10 Explain why it is important to use sensory descriptors when analysing food.

Analysing food products

There are two aspects to the analysis of a food product – quantitative and qualitative analysis.

QUANTITATIVE ANALYSIS

Food sold to consumers must meet the requirements of the Food Standards Code so the manufacturer undertakes a range of scientific tests. The evaluation of food products is done using quantitative or objective tests that are measurable and can provide accurate data. **Quantitative tests** are scientific techniques that can be used to measure features such as size or height, weight, volume, texture, colour, viscosity, shelf life, gel and nutrient content. The test also includes a description of the optimum features of the product to provide a benchmark against which the new product can be compared. These tests use appropriate scientific techniques, giving an accurate report on specific features. On completion of the tests, the company will chart the data in a comparative fashion.

Weight

One of the simplest quantitative tests to undertake is the comparison of the weight of two products. The weight or mass of a product is easily determined by using a set of scales. Digital scales are used because they provide very accurate measures, even for very small weights. It is important for a food manufacturing company to ensure its scales are accurate by having them calibrated or checked for accuracy on a regular basis.



Getty Images/Envision

Digital scales provide accurate measurement when weighing food.

Size

Features such as height or circumference are measured to compare either the product before and after cooking, or to compare different products with each other. The size of a product can be measured using a ruler or tape measure.



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Measuring size

Colour

Colour is one of the most important visual features of a food product and often influences our perception of the food. Most of us have an opinion about what colour a particular food should be and this can influence our reaction to a food product. In food manufacturing it is important to be able to obtain a consistent colour in baked goods, so that, for example, every loaf of bread is the same golden colour when it comes out of the oven. In the past, to be able to measure colour, the food industry relied on using a colour meter. Today, computer technology enables companies to make accurate colour comparisons between products.



iStock.com/small frog

A hand-held colourimeter is a flexible tool used to measure colour of different food products.

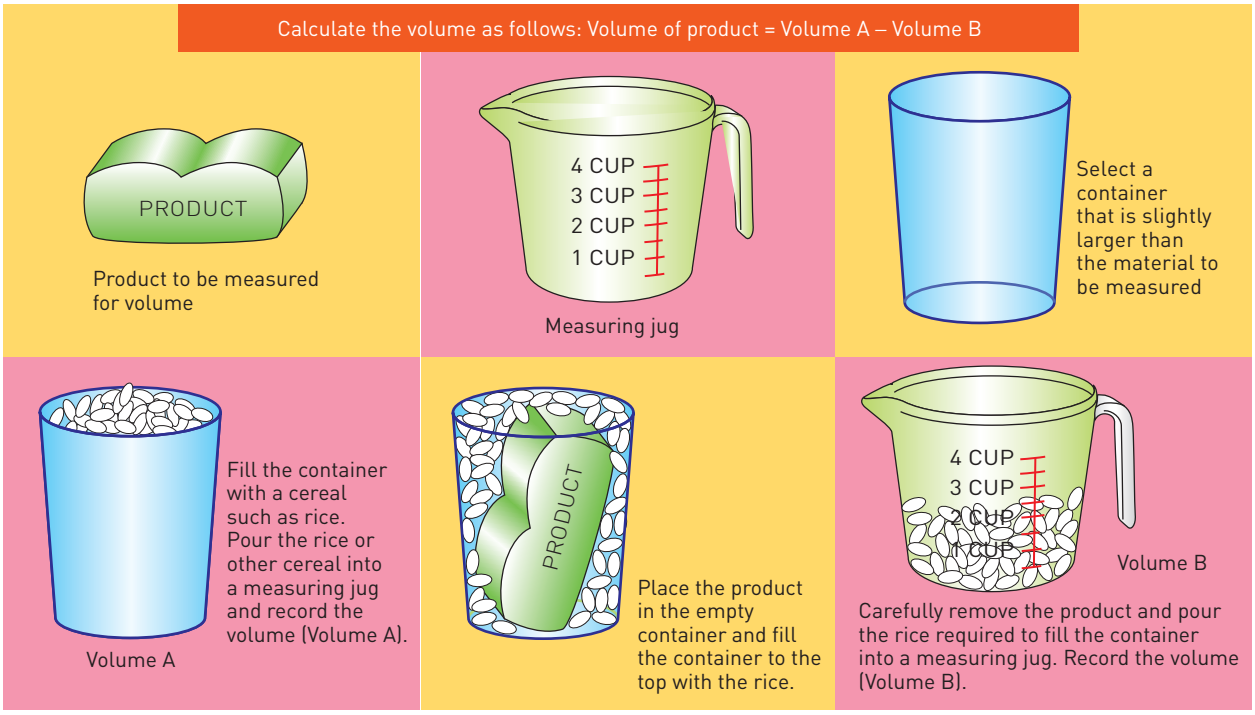
A very simple method of evaluating colour is to use a five-point colour graduation scale, for example, from very pale to very dark.

Volume

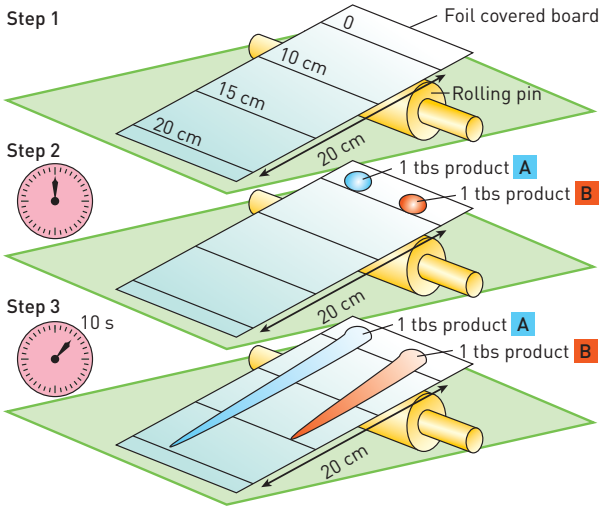
A simple test for measuring the volume of some foods is to use a graduated measuring jug. However, the calculation of volume in products such as bread or biscuits that are substantial in size and uneven in shape is more difficult. The diagram below shows one way of measuring the volume of some products.

Viscosity

Viscosity is a term used to describe the resistance of semi-solid foods to flow. Some substances, such as mayonnaise, are quite thick or viscous, meaning that they do not flow or run very easily. Others, such as oil, are relatively thin or less viscous. To compare the viscosity of two substances, a simple flow test can be developed by drawing two parallel lines approximately 20 centimetres apart on a foil-covered board. Place a marker at 10 centimetres, 15 centimetres and 20 centimetres. Lift one end of the board to form a slight incline. Place a spoonful of the mixtures to be measured at the top of the incline and then record the length of time it takes for each mixture to travel each of the measured distances down the slope.



A method of measuring volume



Measuring viscosity

Chemical analysis

A chemical analysis involves calculating the nutrients in a food product. This testing would be carried out in the food product development laboratories to ensure the product meets the regulations of the Food Standards Code. The information is included on the product label. The nutrient content of each food product is available in two formats – per 100 grams to allow for comparisons between similar products, and per serve.

QUALITATIVE ANALYSIS

Qualitative analysis of the sensory properties of food happens every time we eat. Sometimes, if we are eating with others, we might share and discuss the properties of the food; other times, we might make a mental note to ourselves to try it again or never eat it again. **Qualitative or sensory analysis** involves sensory tests that are used to rate and/or rank the organoleptic or sensory properties of food such as appearance, aroma, flavour and texture. A food producer not only needs to analyse the sensory or organoleptic properties of food to ensure it is appealing to consumers, it must guarantee the quality of the product.

The manufacturer uses sensory analysis in the development of new products or in trying to improve existing foods in its product line to make its product not only acceptable to consumers, but even more desirable than its competitors' product.

Food manufacturers conduct sensory analysis or taste tests to determine consumers' reactions when they eat their food products. These tests can be carried out by an expert tasting panel and/or consumers because everyone has an opinion of the organoleptic properties of food, so it is important the manufacturers receive feedback and identify preferences. Usually one of three types of sensory testing is used when developing a new product:

- **preference tests** – to try to establish how much or how little the testers liked or disliked a given product
- **difference tests** – to try to determine whether consumers can tell the difference between individual samples of food
- **profiling tests** – to give a more detailed description of the sensory properties of the product.

NUTRITION INFORMATION (Average)

Serving Size: 30g (2 biscuits) Servings Per Pack: 24

	PER SERVE	PER 100g
Energy (kJ)	447	1490
(Cal)	107	355
Protein (g)	3.7	12.4
Fat, Total (g)	0.4	1.3
- Saturated Fat (g)	0.1	0.3
- Trans Fat (g)	0.0	0.0
- Polyunsaturated Fat (g)	0.2	0.8
- Monounsaturated Fat (g)	0.1	0.2
Carbohydrate, Total (g)	20.1	67.0
- Sugars (g)	0.9	2.9
Dietary Fibre (g)	3.3	11.0
Sodium (mg)	81	270
Potassium (mg)	102	340
Magnesium (mg)	32 (10% RDI)*	107

This tells you the size of one serving of this food.

This tells you how many serves there are in the whole packet.

This tells you the nutrients in 100 g of this food. This is the best way to compare similar products.

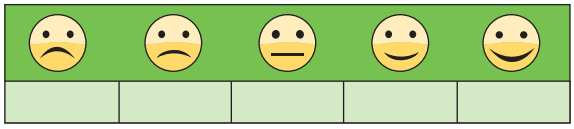
This tells you the nutrients in a single serve of this food; in this case, a serve is 30 g.

A food label contains information on the nutrient content of the product.

Preference tests

A preference test is used when a company wants to gain extra detail about consumer likes and dislikes for a product. Participants in these taste tests use hedonic (relating to pleasure) descriptors which can describe the 'pleasure' a food gives them. Hedonic descriptors can be presented and recorded in a variety of ways:

- Participants describe the food using terms such as delicious, tasty, yummy, luscious, appetising, nice, good, revolting, horrible, dreadful and foul.
- Participants rate food on a nine-point scale (between 1 and 9), with 5 being a neutral reaction: 9 is generally 'liked very much' and 1 is usually 'disliked very much'.
- Participants use a facial hedonic descriptor to describe their reaction to tasting food. This type of descriptor is a simpler technique for measuring food preferences and is often used with children. Participants indicate their preferences using a range of different facial expressions, from one that is very unhappy, to one that is smiling broadly, indicating considerable pleasure.



Facial hedonic descriptors

Difference tests

A number of tests can be undertaken to distinguish the difference between two food products. The results are then analysed statistically to determine whether or not differences are significant.

- Triangle test – This is one of the most commonly used tests. Three samples are presented to the testing panel, two of which will be the same. In this type of test, differences between the samples are often very small. Test panel members can also be asked specific questions about the characteristics of the samples.
- 'Two-out-of-five' tests – This type of test includes three samples that are the same, and two that are different from the other three and from each other. The samples are presented randomly and the panel must decide which two of the samples are different.

Activity 13.2

A triangle test for Australian cheddar cheese

In this test it is important to offer the different testers different orders of samples. In the triangle taste test, six different orders of samples are possible: AAB, BAA, BAA, BBA, BAB, ABB.

Aim: To determine how many class members can tell the difference between two brands of Australian cheddar cheese

Method

1. Your teacher will prepare the samples of cheddar cheese cut into 10-gram cubes and they will be arranged in one of the combinations above for each class member to taste.
2. Sit quietly and take your time tasting each sample of cheese. Consider the sensory properties of each sample – appearance, aroma, flavour and texture.
3. Sip some water after each sample has been tasted.
4. Record which one of the samples is different. Inform your teacher who will then record the information on the class results sheet. Increase the results sheet to match the number of students in the class.

Results sheet

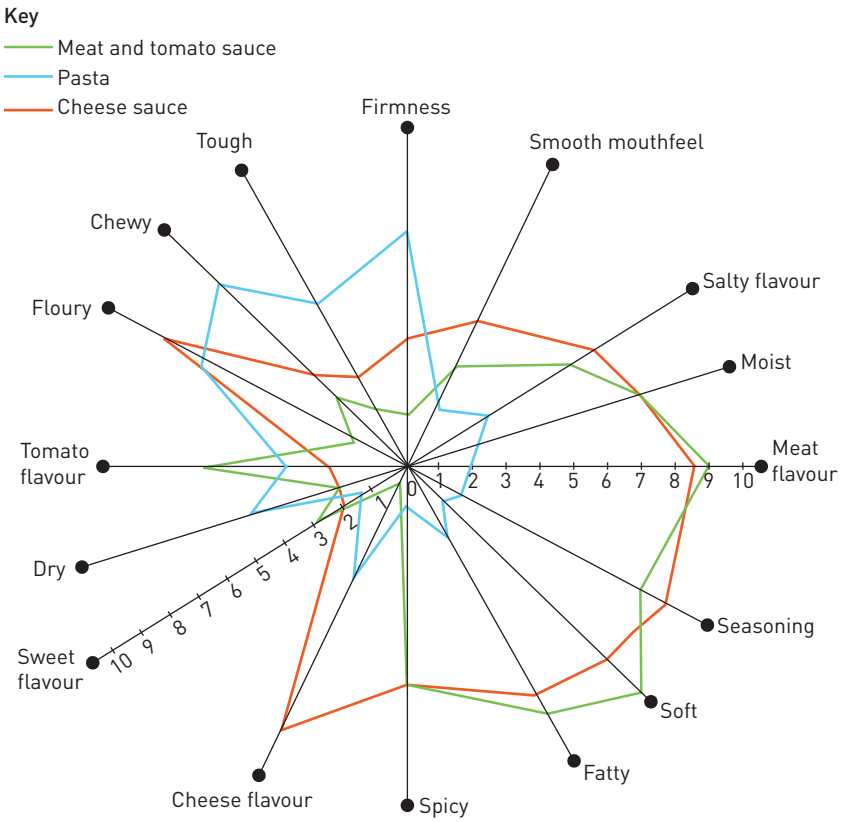
TESTER NUMBER	DID THE TESTER PICK THE SAMPLE THAT WAS DIFFERENT? (MARK WITH AN X)	
	Yes	No
1		
2		
3		
4		
5		
6		
Sample size	Total number of Yes results	Total number of No results

Analysis

1. Was the number of correct responses to the taste test as you expected?
2. Identify some factors that could have influenced the results from your class.
3. Explain why getting the correct response in a triangle test could be difficult.
4. Scientists recommend 80–95 per cent of testers should get the correct response for the data to be of value. How many testers do you think need to take the test for the results to be statistically significant? Justify your answer.

Conclusion

How many class members can tell the difference between two brands of Australian cheddar cheese? How would this information be of value to a food manufacturer developing a new food product?



Star diagram used to record data for profiling test for lasagne

Profiling test

When a food manufacturer wants to find out about the specific properties of a product it will ask trained tasters to complete a profile or descriptive test. This type of test is the most complex of all sensory testing and aims to evaluate the individual components of a product. Food manufacturers can use this type of test to evaluate the characteristics of their own product in comparison with a competitor's product. Each member of the testing panel will rate all the sensory properties of a product such as frozen lasagne. A star diagram is used to record the results and to evaluate the differences.

CONDUCTING A TASTE TEST

Each of the sensory analysis tests – a preference test, difference test or profiling test – requires the food to be tasted. The aim of a sensory analysis is to taste-test and identify preferences among different samples of food, generally using a small panel of experts. These experts are meant to represent the consumers.

When a new product is being developed, trained testers will be given samples of the food to evaluate. They will use a variety of descriptors and tests to produce their results. On other occasions, food producers will use a large group of consumers to evaluate a specific feature of their product, such as

flavour. Because consumers will give highly variable responses, a group of 50–100 people is used to ensure they have a representative sample.

When organising a tasting panel, the following points should be considered:

- Only one characteristic of a food should be evaluated in each test.
- No more than five tests should be carried out at one session, as the ability of testers to distinguish different characteristics will become less accurate.
- A sensory evaluation sheet should be prepared for the members of the tasting panel to ensure each person carries out the same test.
- The members of the tasting panel should also have water to drink or a small portion of dry biscuit to eat to refresh or cleanse the palate after each sample has been tasted.



Alamy Stock Photo/ZUMA Press

Assessing the sensory properties of food

Activity 13.3

A quantitative and qualitative test of rice crackers

Worksheet

Aim: To compare the physical, chemical and sensory properties of different brands of rice crackers

Method

1. Purchase two brands of similar-flavoured rice crackers.
2. Complete a quantitative test to evaluate the physical properties of size, weight and colour of each sample.
3. Use the information on the label to provide details about the chemical properties of the rice crackers – ingredients and nutrients.
4. Undertake a qualitative test using a preference test. Taste the rice crackers to evaluate the sensory properties of appearance, aroma, flavour and texture of both brands of crackers.
5. Record your results.

Quantitative results

	RICE CRACKER SAMPLE 1	RICE CRACKER SAMPLE 2
Name of product		
Manufacturer		
Size of rice cracker • Circumference • Thickness		
Weight of rice cracker		
Colour of rice cracker		
Key ingredients		
Nutrients per 100 grams		

Qualitative results using a preference test

	RICE CRACKER SAMPLE 1	RICE CRACKER SAMPLE 2
Sensory descriptors		
Appearance		
Aroma		
Flavour		
Texture		
Ratings		
Nine-point scale 1 = dislikes very much 5 = neutral 9 = likes very much		
Facial hedonic descriptor		

Analysis

1. Was there any difference in the weight of the rice crackers?
2. Were the rice crackers different in size – in thickness or circumference?

3 Identify the similarities and differences in the sensory properties of the two samples of rice crackers. What could be the reasons for these?

4 Examine the nutrient content of each sample and discuss the differences.

5 Why was it important to use the figures for the nutrient content per 100 grams and not per serve?

6 Describe the differences you noticed in the sensory properties of each of the rice crackers.

7 Consider ingredients in each sample to help explain your results in the preference tests.

Conclusion

Which of the rice crackers did you prefer overall with regard to physical, chemical and sensory properties of the products? Justify your decision.

Comparing homemade and commercial meals and food products

Meal solutions and ready-to-eat meals are a major growth sector in the world of food manufacturing. Preparing and cooking meals from scratch is the 'ideal' for many people, but may not always be possible. Many consumers have very busy lives, which means they don't have time to cook so they look to the time-saving convenience of pre-prepared food that often only requires heating. For those with limited cooking skills, the wide range of meals in the supermarket offers the consumer many choices. The industry is extremely versatile, and with the sophisticated technology that has been developed for use in processing and packaging, it can respond to trends quickly and is constantly introducing new products.

Currently, 'freshness' is on-trend and this has resulted in a huge increase in food products and meals from the supermarket chill cabinet. For example, salads, curries, sushi, savoury tarts, soups, pasta and rice dishes are now freshly made for consumers to purchase on their way home from work. Consumers have become more adventurous and are keen to try new, exotic flavours. Products such as arancini balls, filled with a spicy filling that might take hours to prepare at home from scratch, are now available in the fresh chill section of the supermarket deli.

Food producers now spend a lot of time and money on packaging and the images of the food are very high quality and often make the food look seductive. In fact, some products have become aspirational and television chefs now offer the opportunity of fine dining to all consumers who can simply pick up one of their products at the supermarket. For example, Marion's range of curries, Heston Blumenthal's Christmas puddings and Maggie Beer's ice creams have become popular food items. So, regardless of the reason consumers choose to use meal solutions and ready-to-eat meals, it is essential for food producers to ensure that the sensory properties of their products are appealing so that they can maintain continued sales.



Maggie Beer exotic flavoured ice-creams are a popular addition to many meals.

PHYSIOLOGICAL, SOCIAL AND ECONOMIC CONSIDERATIONS IN MEAL PREPARATION

The person or people who act the nutritional gatekeepers of the family guide the types of food served in the home. There is no definitive list of the healthiest foods; however, using food models such

as the Australian Guide to Healthy Eating helps consumers to make good choices about the food they eat. Consuming whole foods such as grains, vegetables, fruit, moderate amounts of fish, meat and dairy foods and restricting foods high in fat, sugar and salt helps to build a healthy diet. However, when commercial meals are purchased for the family, it is more difficult to ensure these meals meet the Dietary Guidelines as they are often much higher in fat, salt and sugar than similar meals that are prepared at home from scratch.

When you prepare food at home there is more to it than just following a recipe. You might prepare food to be social; for example, you might invite people to your home for a meal; or when visitors drop in, you welcome them by offering food and drink. Maybe you demonstrate affection by giving food and/or use it to create romance. For many people, preparing food and giving it as a gift plays as important social role as it demonstrates affection and concern for others.

On the other hand, when preparing everyday meals if cost is a major consideration, the price and quality of the ingredients might guide decisions about what to cook and serve. Some families might consider it more economical to purchase the individual ingredients to make a meal rather than to buy a ready-made meal; others may think that a fast-food meal is cheaper and it may fit their food budget.

Activity 13.4

Comparison of homemade and commercial beef stroganoff

Worksheet

Aim: To compare the physical, chemical and sensory properties of homemade and commercial beef stroganoff

Method

1. Produce one quantity of beef stroganoff from the recipe at the end of the activity.
2. Purchase a single-serve packet of beef stroganoff from the freezer section of the supermarket. Heat the frozen beef stroganoff according to the manufacturer's instructions so that it is ready to taste-test when your homemade recipe is ready to serve.
3. Complete a quantitative test to evaluate the physical properties of size, weight, colour and number of serves of each product.
4. Use the information on the label to provide details about the chemical properties of the beef stroganoff – ingredients and nutrients for the commercial product. Use a nutrient analysis software program to calculate the nutrients in the homemade beef stroganoff and poppy seed pasta. A good example is the Food Standards Australia New Zealand Nutrition Panel Calculator, available online. Record your results a table like the one that follows.

Weblink

5. Carry out a qualitative test, describing the sensory properties of both dishes in a table like the one that follows. Then perform two preference tests by rating the dishes on a nine-point scale and drawing an appropriate facial hedonic descriptor (see page 214). Remember, everyone has different perceptions of the sensory properties of food so there are no right answers. Try not to influence others in your class with comments or even facial expressions.



Commercial single-serve beef stroganoff

QUANTITATIVE RESULTS		
	HOMEMADE	COMMERCIAL
Name of product		
Manufacturer		
Serving size		
Weight per serve		
Colour of product		
Key ingredients		
Nutrients per 100 grams		
Cost		

QUALITATIVE RESULTS USING A PREFERENCE TEST		
	HOMEMADE	COMMERCIAL
Sensory descriptors		
Appearance		
Aroma		
Flavour		
Texture		
Ratings		
Nine-point scale 1 = dislikes very much 5 = neutral 9 = likes very much		
Facial hedonic descriptor		

Analysis

1. Was there any difference in the serving size of the two beef stroganoff products? If yes, why do you think this is the case?
2. Examine the nutrient content of each sample and discuss the differences.
3. Why was it important to use the figures for the nutrient content per 100 grams and not per serve?
4. Identify the similarities in the sensory properties of the homemade and commercial beef stroganoff. What could be the reasons for these?
5. Describe the differences you noticed in the sensory properties of each product.
6. Consider ingredients in each sample to help explain your results in the preference tests.

Conclusion

Which of the beef stroganoff products did you prefer overall, with regard to physical, chemical and sensory properties? Justify your decision.

Beef stroganoff

200 grams rump steak
2 tablespoons flour
2 teaspoons oil
10 grams butter
½ onion, sliced
3 mushrooms, sliced
1 clove garlic, crushed
2 teaspoons tomato paste
1 cup beef stock
½ cup water
¼ cup sour cream

Poppy seed pasta

100 grams pasta
½ teaspoon salt
10 grams butter
1 teaspoon poppy seeds
1 tablespoon parsley, chopped

Method

Cooking the stroganoff

1. Cut the rump steak into thin strips across the grain.
2. Place flour in a plastic bag, add the meat and shake to coat lightly with flour.
3. Heat the oil in a frying pan. When it is hot, add the butter and brown the meat strips quickly.
4. Add the sliced onion, mushrooms and garlic to the frying pan and fry until the onion is brown and tender.
5. Add the tomato paste, stock and water and simmer until the meat is tender.
6. Remove from heat and stir in sour cream. Do not boil.

Cooking the pasta

1. Fill a large saucepan with water and bring to boil. Add ½ teaspoon of salt to the water, then add the pasta.
2. Cook pasta until al dente and drain.
3. Return the hot pasta to the saucepan and stir through butter, poppy seeds and chopped parsley.
4. Serve the beef stroganoff on the poppy seed pasta.

Serves 1

Understanding the text

11 Define the term 'quantitative analysis'. Prepare a knowledge map to demonstrate the features of a product that could be analysed in this way.

12 What is 'viscosity' and how could this property of a product be measured?

13 Explain how consumers could determine the chemical properties of a food product.

14 What are the organoleptic properties of food?

15 Why do food manufacturers carry out sensory testing on food products?

16 What is a 'preference' test? Give an example of a method of recording a preference test that can be used with small children.

17 Identify and describe two 'difference tests' that are used for measuring sensory qualities of food.

18 Outline a commonly used 'profiling' test and explain why this type of test is often useful to food manufacturers.

19 Explain why meal solutions and ready-to-eat meals are growth areas in food manufacturing.

20 Explain how physiological, social and economic considerations can influence whether meals are prepared in the home or commercial meals are purchased.

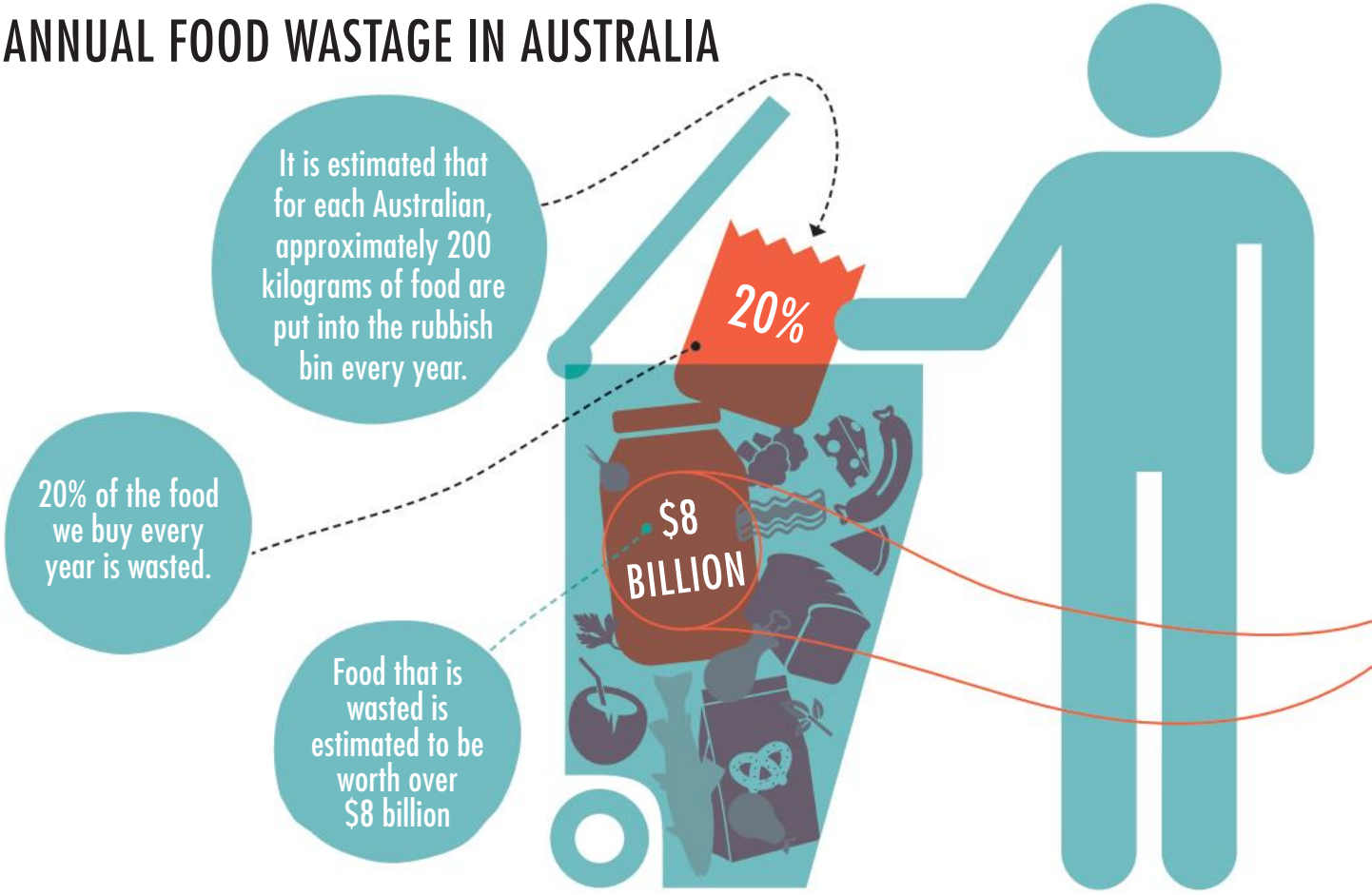
THINKING SKILLS

Worksheet

Apply your knowledge of the sensory properties of food to identify an example of the sensory property focus and then describe and discuss how it is a valuable attribute in food preparation.

SENSORY PROPERTY FOCUS	FOOD EXAMPLE THAT EXHIBITS THE SENSORY PROPERTY FOCUS	DESCRIPTION OF THE SENSORY FOCUS AND HOW IT IS A VALUABLE ATTRIBUTE IN FOOD PREPARATION
Naturally sweet		
Salty flavour		
Sour flavour		
Bitter flavour		
Umami flavour		
A strong aroma during cooking		
A spicy aroma		
Summer fruit with a distinctive aroma		
Aroma that indicates poor-quality food		
Food that is easily damaged if squeezed		
A spongy texture		
Soft but holds together when chewed		
A 'melt-in-the-mouth' texture		
Mouth coating		
Pungent		
Astringent		
Effervescent		
Colour reflects the intensity of the flavour		
A cloudy liquid		
A dull or matt appearance		

ANNUAL FOOD WASTAGE IN AUSTRALIA



HOW TO MINIMISE FOOD WASTE AT HOME

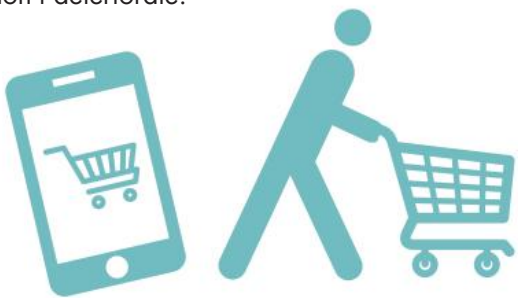
MENU PLANNING

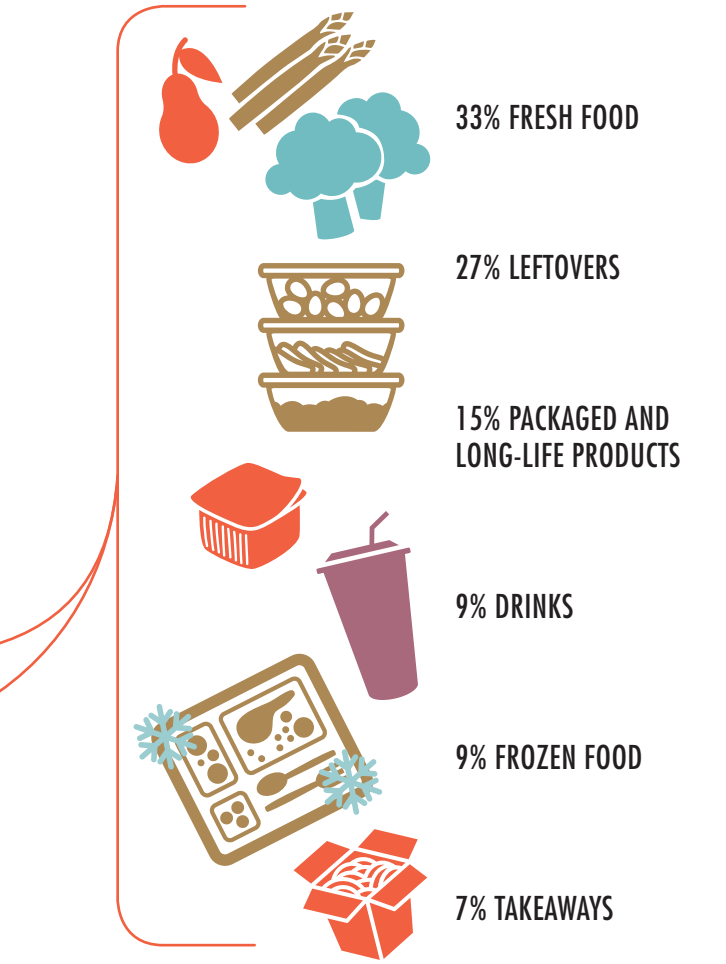
- Find recipes that can use leftover ingredients; for example, use leftover chicken in a fried rice.
- Make minestrone soup in winter from the carrots, cabbage, beans and tomatoes that weren't used during the week.
- Use leftovers for lunch or after-school snacks.



SENSIBLE SHOPPING

- Plan the meals for the week so that you don't buy food you won't be able to use.
- Check the refrigerator and pantry before you go shopping so that you know what ingredients are available for the week.
- Write a shopping list before you go shopping and stick to it.
- Buy fruit and vegetables two or three times a week if possible, so that they stay fresh and don't deteriorate.





CAREFUL STORAGE OF FOOD

- Make sure all food is stored in airtight containers to avoid deterioration.
- Remember to use the 'first in, first out' system in both the refrigerator and pantry.
- Label and date all food in the pantry so that you know when it must be used by.
- Check the 'use-by' and 'best-before' dates on all products before you buy them to maximise their shelf life.
- Store leftover cooked rice in the freezer — it is easy to reheat or make into fried rice.



14 PLANNING AND MANAGING MEALS

KEY TERMS

Resources are factors that affect meal planning and preparation; they include the skills and knowledge of the cook, ingredients, equipment, time and budget.

Seasonal food refers to the time of year when fresh produce is at its peak, and is ripe and plentiful.

Production plan is a plan that itemises and orders tasks that need to be done for the preparation of a meal or menu.



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Australian Guide to Healthy Eating 2015

Factors that influence our food choices and meal-planning decisions

The secret to eating well, for good health, lies in understanding what influences our food choices. At home, knowledge of nutrition, knowledge and skills of how to prepare food, the capacity to plan ahead and effectively manage resources are all considerations for the person or people who make decisions about the food we eat every day.

Having a wide range of resources at our disposal when planning and preparing everyday food can make a task relatively easy to complete. If resources are limited, some tasks can be very challenging. Meal planning is easier if the person who is preparing the food has access to **resources** such as:

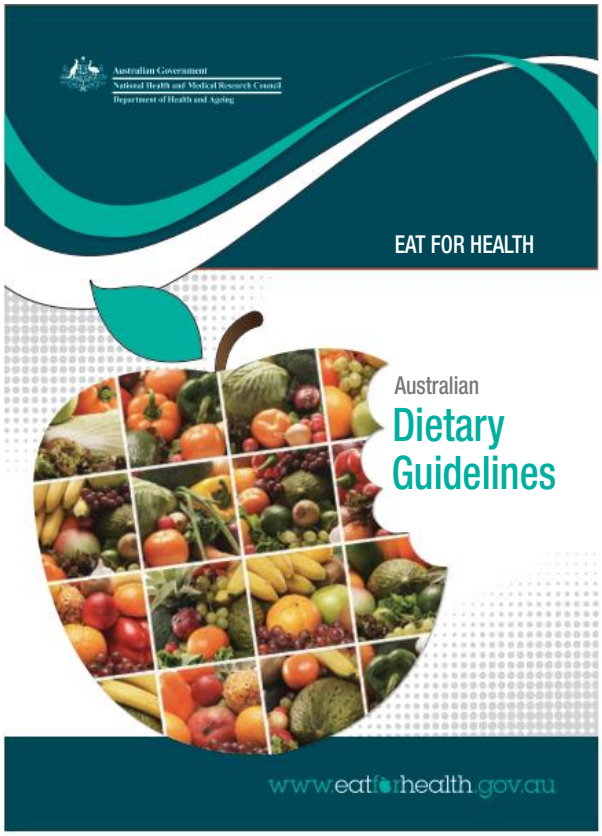
- knowledge of the relationship between nutrition and health
- skills and knowledge in food preparation
- access to suitable ingredients
- equipment that is appropriate for the task
- skills in managing time efficiently
- an understanding of how to manage a food budget.

KNOWLEDGE OF NUTRITION AND HEALTH

Most people value good health, but not everyone who is responsible for food in the home has studied nutrition in detail so the Australian Government, with the support of health professionals, has developed the *Australian Dietary Guidelines* as a model to help families select foods that promote health and wellbeing. There are five guidelines with information about the types and amounts of foods, food groups and dietary issues to assist with planning and selection of food for everyday life.

Dietary Guideline 2

This guideline's message is to enjoy a wide range of nutritious foods and to drink plenty of water and this message should, ideally, underpin the meal planning decisions families make every day. This guideline is presented in a visual format as the Australian Guide to Healthy Eating. The sections in the guide show the proportion of each of the five food groups that should be eaten every day.



Source: National Health and Medical Research Council

Australian Dietary Guidelines

Guideline 2

Enjoy a wide variety of nutritious foods from these five food groups every day

- Plenty of vegetables, including different types and colours, and legumes/beans
- Fruit
- Grain (cereals) foods, mostly wholegrain and/or high cereal fibre varieties, such as bread, cereals, rice, pasta, noodles, polenta, couscous, oats, quinoa and barley
- Lean meats and poultry, fish, eggs, tofu, nuts and seeds, and legumes/beans
- Milk, yoghurt, cheese and/or alternatives, mostly reduced fat (reduced fat milks are not suitable for children under 2 years)

And drink plenty of water

Source: *Australian Dietary Guidelines – Summary*, National Health and Medical Research Council, 2013

Food has to taste good, meet personal likes and dislikes and health issues, and be appropriate for the cultural role food plays in our lives. It is recommended that the foods identified in Guideline 2 are included on the regular shopping list and make up the major part of the foods we buy each time we shop.

SKILLS AND KNOWLEDGE OF FOOD PREPARATION

Meal preparation is often something people either really enjoy or absolutely dread! Some members of the family may have considerable experience and expertise in food preparation, while others have very little. One parent may have a particular interest in cooking and always look for new recipes to try. They may be perfectly happy to prepare the family meal – as long as someone else cleans up and does the dishes! In other cases, the person responsible for meal preparation may not enjoy it at all. They might stick to tried and true recipes, or those that are simple, quick and require few ingredients.



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Families working together to prepare meals can help to develop children's food skills.

Some people gain their knowledge and skills in food preparation by helping a more experienced cook to prepare food. Grandparents might pass on their favourite recipe to their grandchildren and guide them as they make the dish for the first time. More recently, television programs such as *MasterChef*, *My Kitchen Rules* and SBS's *Food Lover's Guide* series have ignited a real interest in people, both young and old, in learning to cook. Shows such as these have led to a surge in cooking classes for young children, which have become a popular school holiday activity. For many people, however, participation in Home Economics, Food and Technology or Food Studies classes at secondary school is the way they learn a wide range of skills in food preparation.

For people with little practical experience in preparing meals, food manufacturers and supermarkets have developed a range of strategies to assist them: food manufacturers sometimes provide recipe brochures to explain and demonstrate how their product can be incorporated into a meal; they design food products that only require opening and heating before serving; and they continually produce a range of new products to keep consumers interested.

Supermarkets have joined forces with food manufacturers to publish in-store magazines such as *Good Taste*, *Fresh*, *Super Food Ideas* and *Coles Magazine,* along with websites filled with information about new products and recipes, including some with step-by-step instructions to help inexperienced cooks. The websites and magazines also inform consumers about new products, how to prepare specific foods and they suggest menu plans for the week – complete with a shopping list and details about how to store the ingredients. Such information enables people with limited food knowledge to evaluate food and make decisions about their nutritional intake.



Food magazines are a good resource for the inexperienced cook.

Supermarket websites, such as those of Coles and Woolworths, and those of food magazines such as *Delicious* and *Gourmet Traveller* also provide consumers with a wealth of helpful information on preparing meals. Recipes for meals, how-to-cook videos, information on gourmet and organic products, fruit and vegetable specials and nutrition information are some of the features of these websites.

Activity 14.1

How to …

Making a new recipe for the first time, or learning a new food preparation skill can sometimes make us a little anxious! Websites such as www.taste.com.au provide instructional videos to help the inexperienced cook learn how to make a special recipe or perfect a challenging technique.

Worksheet

1. Access a website with recipes and select a recipe or skill you would like to know more about.
2. Watch the video and write up a brief evaluation to post on a blog.
   - Do you think there were sufficient steps explained in the video for an inexperienced cook to be able to prepare the dish successfully?
   - Were the instructions clear and easy to follow? Give examples to support your answer.
   - What recommendations would you make to improve the video?
   - Suggest two recipes or skills that you think could be added to the video series, currently not available, that would be helpful for an inexperienced cook.

ACCESS TO INGREDIENTS

Location

Location, location, location! While this might be a favourite saying of real estate agents, where we live can have an impact on our lives in many ways. Access to resources such as a choice of schools, public transport, entertainment and sporting facilities can all be influenced by where we live. One of the most important issues about where we live is that it can determine the access individuals have to purchasing good-quality ingredients to make meals for the family.

If you live in a large town or city, you are also more likely to have access to a wide range of supermarkets and fresh food markets as well as some of the multicultural ingredients that are becoming increasingly popular. Asian, Middle Eastern and Mediterranean supermarkets can be found in all our large cities. Spice markets catering to the Indian and Sri Lankan communities, for example, are also appearing in larger towns and cities. Some suburbs have become centres for particular community groups; for example, Victoria Street in Richmond and Springvale in the south of Melbourne are home to many Vietnamese families so Asian greengrocers are a common sight in many of the shopping strips. Sydney Road, in the Melbourne suburbs of Brunswick and Coburg, is bustling with Middle Eastern bakeries, enticing shoppers to try Turkish pides, Lebanese flatbreads and pastries such as pistachio baklava or pine nut nightingale nests.



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Middle Eastern bakeries on Sydney Road, in the Melbourne suburbs of Brunswick and Coburg, produce fresh products daily for their local community.

However, accessing fresh ingredients at a reasonable price may be more difficult for people who live in a remote area as they may be reliant on the produce available in their local store and have little variety to chose from.



iStock.com/Leadinglights

A one-stop shop in a small country town

Members of farming communities do have one great advantage over city-dwellers – they are very likely to grow their own vegetables and to have the luxury of a few fruit trees, even if not a vast orchard. The family vegetable garden has been one way people who live in rural areas have been able to supply their own fresh lettuce, beans, snow peas, sweet corn, tomatoes, basil, carrots and parsnips for the dinner table for countless generations. Citrus trees, apple and pear trees, stone fruit trees and passionfruit vines on rural properties mean that many families not only have a ready supply of fresh fruit throughout much of the year, but they are able to preserve some of the excess produce to eat when the trees are bare.

The vegetable garden is also becoming a common feature of many suburban backyards – and front gardens too! Herb gardens grown in pots are a common sight on apartment balconies, as are small 'salad' pots filled with several varieties of lettuce.

An interest in organic food is one reason for the upsurge in the backyard vegetable garden. The prospect of using fresh fruit and vegetables that are free of pesticides and herbicides is appealing to many families.



Alamy Stock Photo/Mark A Johnson

A home vegetable garden

Farmers' markets

Farmers' markets have become so popular that they have spread to all corners of Australia, with hundreds operating in both regional and metropolitan areas. These markets allow farmers to sell locally grown, fresh, organic produce directly to consumers. Consumers flock to them in their thousands as they feel the quality of the produce is often superior to the quality of foods available in their local supermarket, as the food has just been picked and not held in cool stores for several months. Artisan cheeses, a huge range of organic vegetables and fruit, jams and relishes, organic breads,



Alamy Stock Photo/Stephanie Jackson

Farmers' markets provide consumers with fresh seasonal produce.

free-range eggs and pure honey are some of the most popular foods available at farmers' markets.

The benefits of buying produce from famers' markets are not just about the ingredients; buying from farmers' markets is also a way in which consumers help to reduce the 'miles' that their food travels. Consumers also enjoy talking with the farmers and understanding how food is grown.

Seasonally available ingredients

Modern technology, food-processing techniques and fast and efficient distribution systems mean that most foods are available all year round. Being able to eat what we enjoy at any time may be desirable, but the concept of 'season' has been lost, particularly with fresh fruit and vegetables. **Seasonal food** refers to the time of year when fresh produce is at its peak, and is ripe and plentiful. For example, strawberries can be purchased throughout the year, but their flavour and texture are most appealing during the summer months because this is the ideal season for picking them. The price of fresh produce also fluctuates over the year – it is most economical when it is in season. Often fresh produce must be transported over long distances, which means that fruit and vegetables are picked when they are immature and unripe. This results in a loss of flavour and quality compared with produce that is locally grown and harvested when it is ripe.

The quality of tomatoes varies considerably with the season. Summer tomatoes have a very intense red colour, a sweet and slightly acidic flavour and a firm, juicy texture. On the other hand, winter tomatoes are often dull in colour, bland in flavour and have a floury texture. Using fresh seasonal food provides unmatched flavour and texture to a dish and will be more economical to produce.

The styles of menus can be designed to reflect the changing seasons throughout the year. Spring menus should be light and fresh, and could incorporate asparagus, beans and new potatoes. Easy-to-prepare dishes with minimal cooking make summer menus enjoyable for the cook and the diner – salads, berries and stone fruit are a great starting point. Autumn is the season in which people begin to look for slightly heavier meals, particularly as the evenings become chilly. Dishes that include mushrooms, spinach or pumpkin are always popular. Substantial food makes people happy in the cold winter months, and dishes incorporating some of the many varieties of potatoes and root vegetables are filling, can be cooked in a variety of ways and always taste great.



iStock.com/billnoll

The aroma and colour of fresh summer tomatoes are intense in this salad.

Activity 14.2

What's in season?

It is always best to buy fruit and vegetables when they are in season as this is when they are at their peak for flavour and colour.

1. Select two types of fruit or vegetables that are currently in season.
2. For each of the fruits or vegetables selected, write a brief summary under the headings:
   - How to select the best
   - Storing for later use
   - Preparation tips
   - Goes well with …
3. Research five recipes suitable for using each of the fresh fruits or vegetables. The website of www.taste.com.au and supermarket sites are a good starting point for this activity.

E-shopping for food

The supermarket revolution rolled across Australia in the 1970s, with the result that the majority of the individual food retailers – that is, the local butcher, greengrocer and baker – have almost disappeared, leaving just a few specialists catering for a niche market. The world of e-commerce is now making inroads into the stranglehold supermarkets have over the food supply chain. Buying fruit and vegetables

online is gradually becoming more popular with consumers. Not only do they get fresh produce delivered to the home, they also receive information about seasonal produce, tips for storage, recipes and details about new varieties of fresh food.



Placeholder photo acknowledgement

My Food Bag homepage

Activity 14.3

Evaluation of a food e-commerce site

Visit the website of an e-commerce food supplier and answer the following questions.

1. How easy is it to find out what produce is available?
2. List the categories used to organise the produce offered on the site.
3. Is the produce available in appropriate sizes for domestic households?
4. What information is on the site, other than what food is for sale?
5. How long does it take for the food to be delivered once it has been ordered?
6. How is the produce packaged and transported to the customer?
7. Is the quality of the food guaranteed?
8. How is payment made for produce?
9. Describe the types of consumers who might shop for food online. Explain your answer.
10. Identify two or three other sites you would be most likely to order food from and explain why.

Worksheet

For some families who are time-poor but enjoy cooking tasty, nutritious meals, My Food Bag, an online company, offers a wide range of dinner meals where all the ingredients for every meal ordered are delivered to the front door (with the exception of some household pantry staples). The company uses fresh Australian ingredients and free-range and sustainably farmed products wherever possible.

Weblink

Understanding the text

1. Explain why the *Australian Dietary Guidelines* is a useful reference when planning the weekly menu for a family.
2. Why is the Australian Guide to Healthy Eating a useful tool for families when selecting food?
3. Draw a knowledge map to demonstrate ways in which a cook can develop their skills and knowledge about food preparation.
4. List three ways the area in which we live can influence the ingredients that are available to make meals.
5. Why is the vegetable garden often an important resource for rural families?
6. Outline why vegetable gardens are becoming a popular feature of suburban gardens.
7. What is a farmers' market? Explain why farmers' markets are popular with many consumers.
8. Explain why seasons are now less important for the availability of food.
9. Outline three ways in which using seasonally available ingredients can be an advantage in meal preparation.
10. Outline three benefits to consumers of purchasing their food online.

AVAILABILITY AND USE OF RESOURCES

Equipment for the kitchen

An endless array of recipes can be found in various books by celebrity chefs, in magazines or on food websites, or demonstrated on television cooking programs. While some of them might be out of our league because we have never, for example, made choux pastry or bread before, others might not be achievable because we don't have the equipment available to produce them.

However, by reading a recipe carefully, it is often possible to adapt the preparation methods if a particular piece of equipment is not available. For example, a cook's knife and chopping board can often be used instead of a food processor for chopping nuts or vegetables. Equally, a hand whisk can produce excellent volume when beating egg white so an electric beater is not really essential. Butter and sugar can be creamed in a bowl with a wooden spoon 'just like Grandma' used to do. There are some instances though, when it is just not possible to replace a particular piece of equipment. For example, an ice-cream machine churns the custard base to give the smooth, velvety texture to ice-cream that we all love. However, if you don't have an ice-cream machine in your kitchen, it is better to look for an alternative recipe such as semifreddo-style ice-cream that does not need to be churned.



Placeholder photo acknowledgement

Good quality knives are an essential kitchen tool.

When setting up a kitchen for the first time, it is not normally possible to purchase all of the equipment you might like to have all at once. When selecting the essential tools for your kitchen, it is best to keep the range simple and buy only what you need, rather than what appeals to you. Purchasing the best quality knives you can afford is a worthwhile investment, as the design and materials they are made from are usually superior. Knives are a very versatile tool and if well maintained – that is, kept sharp and stored safely – good knives will last a lifetime.

Managing time

It seems as though our lives are busier now than ever before. Every member of the family seems to have a range of commitments – part-time or full-time work, study, music lessons, sporting commitments and so on. Trying to juggle the individual commitments of each member of the household often means there is little time left for meal preparation.

According to research complied by the Australian Food and Grocery Council, one of the most important considerations when planning meals to be eaten at home during the week is convenience. The amount of time the majority of the population is willing to spend preparing the evening meal is about 20–30 minutes.

Most supermarkets also provide an online food ordering and delivery service for people who are time-poor or who simply wish to avoid the in-store shopping experience.

Food manufacturers have attempted to assist consumers by producing a range of meal solutions;



Photo with permission of Coles

Supermarkets offer online ordering and delivery services for people who are time-poor.

Activity 14.4

Setting up a kitchen

Setting up a kitchen for the first time can be quite daunting. Prepare a list of equipment you think would be essential if you were setting up a kitchen for the first time. Complete a table like the one below, using the categories as a guide.

Worksheet

CATEGORY	ESSENTIAL EQUIPMENT
Measuring	
Cutting and chopping	
Mixing and beating	
Frying and baking	
Boiling and steaming	
Other	

that is, ingredients or pre-prepared products that can be combined and cooked quickly to form a meal. Supermarkets and some cookbook writers also recognise the needs of busy people and have developed a range of strategies to help consumers make decisions about the food they purchase. They frequently produce online recipes and in-store recipe cards for meals that are quick to prepare, require basic kitchen equipment and are nutritious.

Families might have a little more free time to spend on meal preparation at weekends. They might have members of the extended family or friends over for a meal might, which involves spending much more time in the kitchen preparing something more spectacular than would be possible during the busy working week. Regardless of the time available, being well organised is the key.

The production plan

A **production plan** is a very useful tool to help the cook plan and prepare a meal in the most efficient manner. It is particularly helpful for inexperienced cooks or when preparing a large number of dishes for a special occasion. A production plan helps the cook think about the jobs that need to be done first, and ways tasks can be simplified to ensure there is a smooth workflow in the kitchen. Completing a table similar to the one below helps to identify key preparation processes and cooking methods, and the equipment needed to complete each process. It also identifies important safety and hygiene considerations so that the meal is produced safely. Thinking about the time required to complete each process will ensure that the meal is prepared and served in the most time-efficient manner.

RECIPE:_____ DATE: _____ REFERENCE: _____

Time	Ingredients required	Equipment	Key processes	Health and safety considerations

Activity 14.5

Design brief – a meal in a moment

Worksheet

A large food manufacturing company wants to update the recipes on its website to include more of its new meal solution products. As a chef, you have been asked to design a recipe that can be prepared in 20 minutes. The recipe must incorporate at least one time-saving product from the supermarket, as well as some fresh ingredients, so that it is nutritionally balanced. The meal should be visually appealing and offer a variety of flavours and textures.

Use the design process to design, produce and evaluate a meal to meet the specifications outlined in the design brief.

1 Criteria to evaluate the meal – questions could be developed about:
   - the time taken to complete the meal
   - quality of the time-saving product
   - sensory properties – appearance, aroma, flavour and texture
   - the skill required to complete the meal
   - the nutritional value of the meal
   - the overall success of the meal.
2 Research – collect and present information about time-saving products available in the supermarket. Also include some research about fresh ingredients that can be served with the processed products.
3 Prepare a food order and a production plan for the meal.
4 Produce the meal and share it with a friend.
5 Evaluate the meal using the previously established criteria.



A pasta meal is one of many meal solutions available.

Planning to shop for family meals

Most families don't have an unlimited budget for food. The amount of money available for meals will affect the type of ingredients they are able to use. Weekday meals may be based on cheaper ingredients, such as pasta or rice or minced meat, while more expensive ingredients might be served when friends come to dinner.

HOW TO MAKE THE FOOD BUDGET GO FURTHER

Remember – never go shopping for food when you are hungry!

Planning before you shop

1 Plan meals ahead of time to reduce the number of times you have to shop for food.
2 Selecting recipes before shopping makes it easier to remember likes/dislikes and special dietary requirements of the family.
   - Making several meals with similar special ingredients. For example, if one recipe only uses half a bunch of coriander, look for another recipe with coriander as an ingredient so you can use the rest of it, rather than throw it out.
   - Look for recipes that use cheaper cuts of meat, such as minced steak or chicken wings.
   - Plan on preparing one or two 'meat-free' meals each week.
   - Cook from scratch most nights rather than using pre-prepared products, which are frequently more expensive.
   - Make sure you calculate the amount of food needed for each meal to reduce waste.

3 Check the ingredients in your pantry before shopping so that you don't buy extra ingredients.
4 Write a shopping list before you go shopping – it helps to avoid those tempting products from finding their way into your trolley.



Dreamstime/Sue Harper

Checking the food in the pantry and preparing a shopping list means that you don't buy food you already have.

When shopping

- Compare the price per 100 grams of each product before you buy – what seems to be cheap when it is 'on special' may still be more expensive than other similar items.
- Buy fresh produce, such as meat, poultry, fish, fruit and vegetables, from a wholesale market if there is one in your area, rather than shopping at a supermarket.
- Check the 'use-by' or 'best-before' date so that you don't mistakenly buy something that only has a short shelf life.

Hints to stretch the food budget

- Plant some fresh herbs, such as parsley, thyme and mint, so that they are always available and you do not have to throw away half a bunch.
- Buy non-perishable items such as tinned tomatoes, pasta and oil in bulk and when on special.
- Making your own soups, biscuits, cakes and bread is much cheaper than buying similar commercial products.
- Make lunch to take to school or work rather than buying lunch.

CALCULATING QUANTITIES OF FOOD

Managing and balancing the food budget at home requires an understanding of efficient strategies for ordering and purchasing the correct amount of food. In order to calculate the size of the portions to be served, you need to consider several factors, including:

- the age of the diners
- the gender of the diners
- the amount of physical activity they undertake
- the style of the meal – a weekday meal, casual barbecue or formal dinner
- the season – in winter people tend to eat more
- the health and likes and dislikes of the diners.

Most recipes give a suggested number of portions the dish will serve, but the cook must then consider the above factors when calculating quantities of ingredients.

COSTING A RECIPE

To make sure the family is able to keep within their food budget, it is important to understand how much each meal is likely to cost.

Activity 14.6

Recipe calculations

1 Complete this activity using the recipe for sweet corn and bacon quiche on page 284. The recipe serves two people.
2 Draw a table similar to the one below to record the quantities of ingredients for four, six and eight people. Remember to record the unit of measurement if required.

INGREDIENTS	QUANTITIES OF INGREDIENTS		
	4 people	6 people	8 people

3 What changes you would make to the quantities if all the diners were young male adults?

4 If the dish were to be served to a group of elderly people, how would that affect the quantity of food you need?

5 Suggest some foods that could be served to accompany this dish to make a midweek meal in spring, but without increasing the cost too much.

6 How would you present this dish to suit a more formal sit-down dinner?

Activity 14.7

Costing a recipe

1 Calculate the cost of making a sweet corn and bacon quiche following the recipe on page 284.

2 Visit a supermarket or use the online shopping facility of a major supermarket website to find the cost of each ingredient in the recipe.

3 Draw a table like the one following to record the cost of each ingredient in the quiche. Use the following equation.

$$\text{Cost} = \frac{\text{number of grams of flour required} \times \$ \text{ cost per kilogram}}{1000}$$

For example, if the recipe requires 125 grams of flour, which costs $2.50 per kilogram, then the cost = 125 × $2.50 ÷ 1000 = $0.31 or 31 cents.

4 What is the total cost to produce one quantity of the sweet corn and bacon quiche recipe?

5 For which ingredients is it difficult to estimate the cost because they are required in small quantities?

6 Which ingredients might be subject to price fluctuation depending on the season?

7 Explain why it is necessary to include the cost of all ingredients when costing a recipe?

8 How could you reduce the cost of the sweet corn and bacon quiche? What effect might this have on the finished quality of the dish?

9 If some ingredients appear more than once in the costing table, what do you need to remember when finalising the total cost of the recipe?

10 Identify other factors that might be included when costing a recipe.

INGREDIENT	AMOUNT USED	UNIT COST	COST
flour	125 grams	$2.50 per kg	$0.31
self-raising flour	2 tablespoons (20 grams)		
salt	pinch		
butter	90 grams		
egg yolk	1		
onion	½		
bacon	2 rashers		
olive oil	2 teaspoons		
canned corn kernels	½ cup (75 grams)		
sour cream	⅓ cup (100 ml)		
milk	¼ cup (60 ml)		
eggs	2		
cheese	½ cup (60 grams)		
parsley	3 teaspoons		



Sweet corn and bacon quiche

Understanding the text

11 You want to make a chocolate cake, but you don't have all the equipment listed in the recipe. Suggest alternative equipment you could use instead of each of the following so that you can still make the chocolate cake:
   - a food processor for chopping the chocolate
   - a double boiler to melt the chocolate
   - an electric mixer to beat the cream for the decoration.

12 Explain how the availability of time can influence the types of meal a family might prepare.

13 What are 'meal solutions' and how do they help time-poor families in their meal preparation?

14 Explain how preparing an effective production plan helps the cook to prepare meals efficiently.

15 Why is writing a shopping list useful when shopping for food?

16 List four other planning strategies you could use before leaving home to shop for food.

17 Explain why reading the labels of food products is useful when making decisions about which items to purchase.

18 Identify two hints for a young person moving out of the family home to help them keep within their food budget.

19 Outline considerations that should be taken into account when calculating how much food to purchase.

20 How can costing a recipe help a family keep within its food budget?

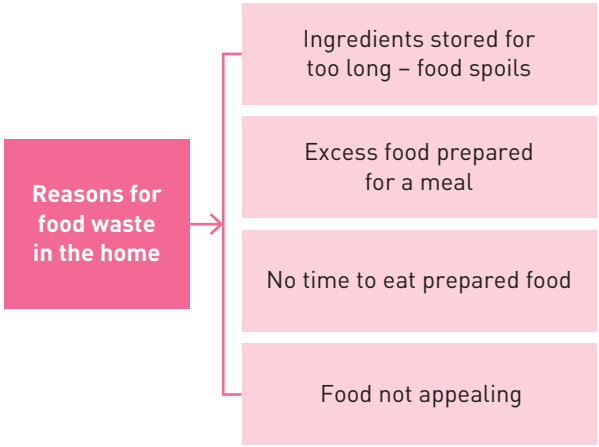
The environmentally conscious cook

Most people in the community are aware that as a society we need to become more environmentally conscious. At present, most of us take small steps towards environmental sustainability – we remember to separate the rubbish and put out the recycling bin, some of us compost our food scraps, switch off the lights if no one is in the room and remember to take the green bags when we go shopping. There are, however, a variety of other issues that we need to consider to be even more environmentally conscious, including:

- minimising food waste
- reducing the 'miles' or kilometres food travels
- using seasonally available ingredients.

MINIMISING WASTE

Wasting food is something most of us have been guilty of at one time or another. Family life is very busy so often we don't remember to check the pantry



Reasons for food waste in the home

or fridge before we go shopping. In the fridge, the sour cream left over from making that delicious cake is suddenly out of date and nobody seems to want the rest of the orange juice. The lettuce or celery that have been sitting in the crisper for several weeks begins to wilt and look limp and slimy, or the cheese might have gone mouldy. The bananas or pears in the fruit bowl go from being just ripe to the bruised and 'too squishy' stage within a day. The packet of biscuits that managed to find its way to the back of the pantry may be past its 'best-before' date before being discovered. That exotic spice used to make the beef curry hasn't seen the light of day for two years and that can of lychees still hasn't been used. Into the bin with them all! What to do with the leftovers can also be a challenge for families. Will they be safe to eat if they're reheated for lunch tomorrow? Can they be used to make a breakfast or brunch snack on the weekend, or do we just throw them out?

The school day is busy too. Basketball practice or athletics training might be scheduled at lunchtime, so trying to find time to eat the sandwiches you brought from home can be tricky. It is often easier just to eat an apple or banana on the way to the next class than juggle the salad sandwich as well as your IT device, books or art folio. By the time you get home from school, the sandwich might look a little wilted and soggy so the only solution seems to be to throw it into the bin.

FACTS ABOUT FOOD WASTE

Food waste is recognised as having both economic and environmental implications for the community. According to research completed by Foodwise, Australians throw away more than 20 per cent of the



Alamy Stock Photo/Phanie

'Will this be ok to use next week?'

food we buy every year. As every family knows, food is not cheap and the food that is wasted is estimated to be worth over $8 billion. Annually, this equates to every Australian household spending more than $1500 on food that is wasted. In terms of the volume of food we send to landfill, it is estimated that for each Australian, approximately 200 kilograms of food is put into the rubbish bin every year.

The majority of food that we waste is fruit and vegetables, but leftovers from family meals are another major contributor to food waste. Other food waste occurs when we buy food from takeaway outlets and don't eat it all. Restaurants also have a problem with what to do with meals that customers don't finish – it certainly can't be recycled and served to the next customer! Supermarkets also find they are faced with wasting food when, for example, a product is discontinued, labelling regulations change or a fresh product such as bread or cheese passes its 'use-by' or 'best-before' date. And then there are the bakeries, greengrocers, fresh food markets and fishmongers – what to do with that excess stock that won't be suitable to sell the next day? Food waste is a

problem not only for individual families, but also for the community.

As well as having financial implications for individual families and commercial food businesses, food waste also creates problems for the environment. Food waste that is sent to landfill produces methane, a very damaging greenhouse gas. However, greenhouses gases are not only released when organic material such as food breaks down. When food is grown, processed, refrigerated, stored and transported, energy is used. This energy releases greenhouse gases that are damaging to the environment and so when we throw food away, the energy used to produce the food is simply wasted. Food production also uses water and so this valuable resource is also wasted when food is thrown away, with implications for the environment.



The annual cost of food wasted in Australia



123rf/Ian Allenden

Leftovers contribute to food waste.

HOW TO MINIMISE FOOD WASTE AT HOME

Menu planning

- Find recipes that use leftover ingredients; for example, use leftover chicken in a fried rice.
- Make minestrone soup in winter from the carrots, cabbage, beans and tomatoes that weren't used during the week.
- Use leftovers for lunch or after-school snacks.

Shopping for food

- Plan the meals for the week so that you don't buy food you won't be able to use.
- Check the refrigerator and pantry before you go shopping so that you know what ingredients you have on hand to use during the week.
- Prepare a shopping list before you go shopping and stick to it.
- Buy fruit and vegetables two or three times a week if possible so that they stay fresh and don't deteriorate.

Storing food

- Make sure all food is stored carefully in airtight containers to avoid deterioration.
- Remember to use the 'first in, first out' system in both the refrigerator and pantry.
- Label and date all food in the pantry so that you know when it must be used by.
- Check the 'use-by' and 'best-before' dates on all products before you buy them to make sure you can maximise their shelf life.
- Store leftover cooked rice in the freezer – it is easy to reheat or make into fried rice.

Understanding the text

21 List the issues to consider when making environmentally sustainable decisions about the food cooked at home.

22 Identify reasons why food is wasted in the home.

23 Why do you think fresh food, particularly fruit and vegetables, are the foods most wasted by Australian families?

24 Draw a diagram to demonstrate some of the reasons food might be wasted in the supermarket sector.

25 Outline the environmental issues associated with food waste.

26 Study the pie chart on page 238. Outline the types of food wasted in Australia and rank them in order from largest to smallest.

27 Would you have expected the results you achieved when ranking types of food waste? Justify your answer.

28 Outline some strategies families could follow to minimise waste when planning meals at home.

29 Explain why checking the pantry before going shopping helps to minimise food waste.

30 Why is the method of storage an important consideration to assist in reducing food waste?

Activity 14.8

How to reduce food waste within your school community

1 Work in small teams to develop a poster that could be displayed around your school or used on the school website to inform people of the issues around food waste and strategies they could use every day to reduce food waste.

2 Some focus areas for the posters could be:

- the groups of people who are the biggest wasters of food
- strategies to reduce food waste at home and school
- portion planning in meal preparation – helps reduce waste
- types of food wasted in the home and at school.

Remember, a poster is a visual message and should not have a lot of writing.

THINKING SKILLS

Work in pairs or small teams to design and produce a menu for a picnic, following the tasks outlined below. The menu should include two savoury items and one sweet treat. The food must be designed to be eaten with fingers and packaged in an environmentally friendly manner.

1 As a team, plan two savoury items and one sweet treat.

2 As a team, consider each of the food items to be prepared and decide on the components each student will complete.

3 Complete a food order for one quantity of each of the recipes. Organise the ingredients under the following headings:

- Fruit and vegetables
- Deli and dairy
- Groceries
- Meat and poultry
- Other

4 Prepare a production plan for each person – divide the tasks for the three recipes equally. You may share in the preparation of some of the recipes.

5 Describe the best methods to store each of the ingredients from the menu to maintain their optimum quality before cooking begins.

6 Prepare the food and present it as it might be served on a picnic.

7 As a team, write up an evaluation that focuses on:

- the accuracy of the food order
- the effectiveness of the production plans
- the benefits and disadvantages of working with a partner or in a small team to prepare food – consider the degree of cooperation and skills of individuals and the equity of the tasks
- improvements for future joint productions.

CONSIDERATIONS WHEN COOKING FOR OTHER PEOPLE

- Specific dietary requirements
- Medical requirements
- Cultural and ethical restrictions
- Food allergies and intolerances

WHAT TYPE OF COOK ARE YOU?

METHODICAL

- Relies on recipes
- Products look like the picture

CREATIVE

- Innovative and rarely uses recipes
- Trend setting

SHARING

- Cooks family favourites
- Rarely experiments

HEALTHY

- Fresh produce
- Health before flavour

COMPETITIVE

- Cooks to impress
- Perfectionist



15

DESIGNING AND ADAPTING RECIPES

KEY TERMS

Insoluble fibre is a carbohydrate found in plant foods. It is not broken down in the digestive system and helps food move through the bowel.

Osteoporosis is a degenerative disease of the bones; the bones lose their strength and thickness (density), which leads to a higher risk of fractures.

Soluble fibre is one of the carbohydrates in plant foods. It absorbs water during digestion and becomes gel-like, slowing down the process of digestion.

Vegans are people who do not eat or use animal products.

Vegetarian diet consists of grains, pulses, nuts, seeds, vegetables and fruit. The diet does not include any meat, poultry, game, fish, shellfish or by-products of slaughter.

Managing food choices to meet specific dietary needs

Many cooks use recipes to prepare family meals and sometimes adapt them to meet the specific dietary needs or personal eating plans of family members. Some family members may be very active, and require a diet that provides a higher energy intake than others who may be less active. Some might love the crunch of a fresh green salad, while others will only eat cooked vegetables. It might be that some people wish to reduce their intake of refined white flour so want to replace it with flour from wholefoods such as almonds, spelt, oats or coconut when making baked products. The challenge for the home cook is to take into account all of the differing dietary needs of their family when they are planning meals, and then adapt recipes so that everyone enjoys the food they eat.

LIFE SPAN STAGE

Developing healthy eating patterns begins early in life. In Australia, most people have access to a wide variety of affordable, nutritious foods, but don't always select wisely for themselves and for their children. In Australia, more than 60 per cent of preschool children attend childcare so this is an ideal opportunity to reinforce good dietary habits that they will carry into adulthood. It is recommended that toddlers of one to two years of age should be consuming two to three serves of vegetables and one serve of fruit each day. Currently, web-based programs are being developed to support childcare services to improve the intake of fruit and vegetables at both snack times and mealtimes, with the aim of reducing the development of cardiovascular disease later in life. In the home families need to encourage toddlers to eat fresh fruit and vegetables by leading by example – eating a bunch of grapes for a morning snack rather than a sweet biscuit or serving carrot and celery sticks with a dip instead of salty cracker biscuits. Regular family recipes can also be adapted; for example, adding grated zucchini to a hamburger mix or to a cake mix increases the nutrient content of the product.

Nutritionists also recommend that parents and carers discuss with the children and adolescents in their family the food and drink they consume during the school day so that they can develop a plan that will promote the consumption of healthy beverages. All children, no matter what their age, weight, height and gender, need to eat from all the food groups every day. The reasons for this are that healthy, balanced lunches and snacks, along with drinking plenty of water, help to reduce fatigue, irritability and poor concentration, and ensure students' minds are active and ready to learn.



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Young children should be encouraged to enjoy fresh fruit and vegetables.

Healthy lunch boxes should contain some carbohydrate foods, preferably wholegrain; some protein foods, either meat, fish, eggs or legumes; a dairy item such as cheese, yoghurt or a plain milk drink; and salad and vegetables and/or fruit. To ensure students are well hydrated throughout the day they should have easy access to fresh water and be encouraged to refill their water bottles during breaks. Healthy lunch boxes should *not* contain foods high in sugar, fat or salt. Those preparing lunch boxes should avoid the processed foods that are packaged in small portions and marketed specifically for lunch boxes as they are usually unhealthy and expensive. Here again, the adults in the family should model healthy eating and if children pack their own lunch, it should include all the food groups or recipes children like, but adapted to increase the nutrient value.



iStock.com/Brett Mulcahy

A healthy lunch box includes all the food groups.

ACTIVITY LEVELS

Being physically active every day is one important aspect of achieving and maintaining a healthy body weight. It builds muscle and bone strength, and helps to keep the brain in top condition. Children and adolescents should be involved in moderate to vigorous exercise for at least 60 minutes every day. Moderate activities require some effort and you will be able to talk to others while doing moderate exercise such as walking briskly or playing social tennis. Vigorous activities such as jogging, aerobics, football and netball make you huff and puff and talking is difficult.

For your own wellbeing, the energy you take in from the food you eat should equal the energy used in your everyday life. So if you are very active, you will probably need to eat more than someone who does little exercise. Using food models such as the Australian Guide to Healthy Eating helps guide your food choices and support your energy needs to maintain a healthy weight.



Sedentary activities

- sitting
- lying down



Light activities

- standing
- moving around home or school



Moderate activities

- walking briskly
- gentle swimming



Vigorous activities

- jogging
- aerobics

Top to bottom: iStock.com/ImageDB; Shutterstock.com/antoniodiaz; Jacek Chabraszewski; Milkos

Different activity levels

PERSONAL TASTES AND PREFERENCES

Designing meals to suit individuals within households can be quite a challenge for the person responsible for preparing and cooking family meals. Often it can be a question of balancing the likes and dislikes of family members with the desire to create a meal that has a wide variety of foods from all the food groups. In fact, the cook in the family might be like the big fast-food chains in North America – once they know and understand the palate of a particular country, they adjust products for the local market. For example, in Japan, McDonald's offers a Teriyaki McBurger with seaweed shaker fries. Yum Foods, a company that processes Tex-Mex foods designed crunchy potato tacos and extra spicy burritos filled with paneer, a fresh rubbery Indian cheese, for the Indian market.



iStock.com/James Tutor

Children take an interest in healthy eating if they are involved in buying and preparing food.

Customising the food served is a crucial strategy to ensure good sales in the global fast-food business and this is very similar to the home cook who adapts meals to ensure the family is well fed. It can be as simple as making a green salad and serving it in two bowls – one that has a vinaigrette dressing and the other undressed. Maybe not everyone enjoys hot chilli so curries can be prepared using a mild curry sauce, and extra chilli sauce, or sliced fresh chilli can be served as an accompaniment for those who want to add more heat to the dish. Raw vegetables such as carrots and broccoli can be a favourite with some people, and for those who prefer them cooked, a quick zap in the microwave does the trick.

MEDICAL – FOOD AND HEALTH

For many years, people have understood that some foods are better for our health than others. The saying 'an apple a day keeps the doctor away' has been a message that has helped people stay fit and healthy for many generations.

In recent years – as our knowledge of the link between diet and good health has increased – many people have been attempting to modify and improve their diet by reducing their intake of fat and sugar or by increasing the amount of fibre and calcium they consume. This positive approach to improving health is a direct response to the evidence that diet-related disease has become endemic in the Australian population.

Medical research has shown that diet-related disease is responsible for a high proportion of all deaths in Australia. Some of the most common diet-related diseases include cardiovascular disease (coronary heart disease, stroke and hypertension), obesity, colorectal cancer and type 2 diabetes. Many Australians are now taking action to improve their health by modifying the ingredients and methods they use to cook food. Consumers today also demand that the food products they purchase help them to improve their health and quality of life.

Reducing fat in our diet

Consuming too many kilojoules has become a major problem for many people, both old and young. Recent data indicates that 68 per cent of all Australian men and 55 per cent of Australian women are either overweight or obese. Equally disturbing is the knowledge that one in four Australian children and adolescents are considered to be overweight or obese.

Being overweight or obese is linked to several major health concerns, especially coronary heart disease, high blood cholesterol, type 2 diabetes, high blood pressure and stroke. Coronary heart disease is one of the most serious diseases linked to obesity and is responsible for approximately 23 per cent of all deaths in Australia. Every day approximately 80 Australians die from coronary heart disease.

It is now widely accepted that one of the most important factors in reducing obesity and decreasing the likelihood of developing coronary heart disease is to reduce the consumption of foods that are high in fats, particularly saturated fat and therefore cholesterol. Food producers too have met the growing demand of consumers for low-fat, cholesterol-free foods by producing a wide range of foods in almost every product range, including milk, cheese, yoghurt, sweet and savoury biscuits, snack foods and pre-prepared meals.

How to decrease fat in recipes and meals

- Increase your intake of vegetables and salads with main meals as these are high in fibre and low in fat.
- Choose lean meats.
- Trim the visible fat from meat and remove the skin from poultry.
- Avoid cooking by frying and roasting where possible and use grilling, steaming, stir-frying or microwaving as methods of cooking instead.
- Make cakes, biscuits and slices with a low-fat spread instead of butter and only use the egg white rather than the egg yolk where possible.
- Use a Teflon-coated wok or frying pan and only grease it lightly for shallow-frying or stir-frying.
- Try cooking in olive oil, which contains mono-unsaturated fatty acids, instead of butter, which is high in saturated fatty acids.
- Snack on fat-free fruit and vegetables, such as apples, oranges, celery and carrot sticks, instead of high-fat and sugary snacks, such as sweet biscuits, doughnuts, pastries, potato crisps and muesli bars.
- Avoid using cream as an enriching ingredient in soups and desserts – try low-fat yoghurt instead.
- Spread sandwiches with a low-fat cream cheese spread or low-fat vegetable dip, rather than butter and margarine, then top with a low-fat filling such as tinned tuna and salad vegetables.

Activity 15.1

Two-minute noodles

For this task, purchase four different brands of two-minute noodles. The samples should have similar preparation methods, such as requiring boiling in a saucepan, or having boiling water added to the bowl or cup.

Worksheet



Types of two-minute noodles

Aim: To evaluate the fat and salt content of two-minute noodles

Method

1. Read the label of each sample carefully and list the ingredients found in each as stated on the label.
2. Analyse the features of each brand of noodles and record information in the table that follows.

Analysis

1. Which brand of two-minute noodles has the highest fat content and which has the lowest fat content?
2. Why is fat added to a product like two-minute noodles?
3. How does the fat content compare with the fat content of a 50-gram packet of potato chips (16.05 grams of fat in a 50-gram packet) and a croissant (26.5 grams of fat)?
4. Does the fat content of two-minute noodles surprise you? Why?
5. Which brand of two-minute noodles had the highest salt content and which had the lowest salt content?
6. How does the salt content of two-minute noodles compare with the 'adequate intake'? 'Adequate intake' of salt is defined as 20–40 mmol (460–920 mg) of sodium per day. This corresponds to 1.15–2.3 grams of salt. How does the salt content of two-minute noodles compare with the 'adequate intake'?

Conclusion

What implication does eating this product regularly as a snack food have for long-term health?

	BRAND 1	BRAND 2	BRAND 3	BRAND 4
Main ingredients				
Ingredients classified as additives				
Grams of fat per 50 grams serve				
Grams of salt per 50 gram serve				
Sensory properties				
Flavour: very salty, salty, not salty				
Texture of noodles				

Understanding the text

1 Identify some of the dietary factors cooks take into account when preparing family meals.
2 Describe how toddlers can establish good eating habits, particularly eating sufficient fruit and vegetables for good health throughout their life.
3 Outline the types of foods that would be included in the lunch box of a healthy preschool child.
4 Explain why activity levels of family members should be considered when planning family meals.
5 Describe how some fast-food chains meet the preferences of specific customers. How can that strategy translate to the cook preparing family meals at home?
6 Why are diet-related diseases considered to be of such concern to the Australian community?
7 What are the main diet-related health concerns in Australia?
8 Explain why obesity is now considered to be one of the major health issues in Australia. What percentage of deaths in Australia is linked to coronary heart disease?
9 Outline three ways in which you could adapt your methods of cooking to reduce fat in your diet.
10 Suggest four alternative ingredients you could use to prepare a meal with a lower fat content.

Increasing fibre in the diet

Along with reducing fat, sugar and salt in our diet, health professionals encourage us to increase the amount of fibre we consume. High-fibre diets have been shown to benefit our health by helping to relieve constipation, prevent bowel cancer and lower blood cholesterol levels. A high-fibre diet, especially one based on foods with a low GI, is also thought to help people living with diabetes.

Insoluble fibre is found mainly in wholegrain cereals and bread, legumes and vegetables. It is not broken down in the digestive system, but helps food to move through the bowel by adding bulk to the faeces. It is known that a diet that includes insoluble fibre can reduce the likelihood of developing bowel cancer.



High-fibre breakfast cereal

Soluble fibre, which is found in high proportions in fruit and the bran from oats and rice, is particularly useful in reducing cholesterol. It absorbs water during digestion and becomes gel-like, slowing down the process of digestion.

Colorectal or bowel cancer is one of the most common forms of cancer worldwide, and medical evidence suggests that almost 70 per cent of bowel cancers could be prevented by improving our lifestyle. To reduce the risk of developing bowel cancer, it is recommended that we increase our consumption of wholegrain cereals and vegetables, reduce our intake of red meat and alcohol, and become more physically active. It appears that omega-3 fatty acids found in oily fish may act as a preventative agent in bowel cancer.

Now that the link between high-fibre diets and a reduction in the incidence of bowel cancer has been firmly established, many people are trying to increase the fibre content of daily meals. Food producers too are developing products to specifically meet this health need. A wide variety of breads based on whole-grains is now available, and more recently the probiotic cereal Hi-maize, containing resistant starch, has been included in breads and other products such as yoghurt.

How to increase fibre in recipes and meals

- Select wholemeal products, such as flour, bread, pastas and rice, instead of refined products.
- Prepare your own breakfast muesli using rolled oats and bran, which are high in dietary fibre, as an alternative to commercial products.

- Make your own high-fibre cakes, biscuits and pastry products by substituting half of the white flour with wholemeal flour.
- Substitute meat with legumes and pulses in casserole-based dishes.
- Make pasta dishes with wholemeal pasta instead of white pasta.
- Do not peel vegetables – cook them with the skin on.
- Try making rice dishes such as fried rice with brown rice.

Increasing calcium in our diet

Osteoporosis is a degenerative disease of the bones that is quite widespread in the community. It commonly affects adults and people in late adulthood. Recent data indicates that one in two women and one in three men over the age of 60 are likely to develop the condition. Osteoporosis is characterised by less dense and porous bones that become brittle and prone to fracture, particularly the hips, wrist and spine. Other symptoms include severe pain, usually in the back, and an apparent loss of height usually caused by the development of a stooped posture.

Women are at far greater risk than men of developing osteoporosis because they naturally have less bone mass as a result of their generally smaller size. Another key factor is that during menopause, the levels of the hormone oestrogen (which regulates the amount of calcium in the blood) begins to drop. High oestrogen levels are important in slowing the loss of bone density. Although post-menopausal women are at far greater risk than men of developing osteoporosis, many younger women are also at risk. This includes gymnasts, dancers, marathon runners and young women who suffer from anorexia, all of whom generally have a low body weight and low body fat, and menstrual periods that are either infrequent or non-existent.

To safeguard against osteoporosis, it is important that all adolescents eat a diet high in calcium and participate in regular weight-bearing exercise to develop their peak bone mass before they reach adulthood. The body also requires an adequate intake of vitamin D to help with the absorption of calcium. Vitamin D is readily produced by the action of sunlight on the skin, as well as being found in food sources such as many dairy foods, oily fish, eggs and margarine.

Many food producers now produce a range of products that have been enriched or fortified with calcium to meet the growing demand by consumers. The range of milk types that are high in calcium is now quite extensive and recently the producers of fruit juices have developed a calcium-enriched orange juice. Other food producers have simply relabelled their products to highlight the naturally high calcium content of their products, such as cheese and yoghurt.



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Foods high in calcium help safeguard against osteoporosis.

How to increase calcium in recipes and meals

- Use calcium-enriched milk and/or yoghurt in baked products such as cakes and puddings.
- Choose hard cheeses (such as cheddar or Gouda) and drink calcium-enriched milk.
- Use yoghurt as a topping for breakfast cereals or desserts.
- Canned salmon, crushed with the bones can be used as a major flavouring ingredient in a variety of savoury dishes and is delicious in risotto.

Activity 15.2

Calcium-rich foods

1. Compare the calcium content of a range of products advertised as 'calcium-enriched' with similar traditional products, such as cheese slices, orange juice, milk, yoghurt and breakfast cereal.
2. Draw up a list of foods for breakfast, lunch, dinner and snacks that would enable adolescents to meet their 'adequate intake' for calcium. Note the calcium content and quantity required of each food for each group. The recommended daily intake (RDI) or 'adequate intake' of calcium for adolescents between 12 and 15 years is 1300 mg a day.

3 Access the website of the Better Health Channel or Osteoporosis Australia.

- What are some of the causes of osteoporosis outlined on these sites that have not been noted on page 247?
- Draw a knowledge map to highlight the tips to help prevent osteoporosis.
- What suggestions are made about foods that should be eaten in limited amounts?
- What treatments are available for people suffering from osteoporosis?

Weblink

Weblink

Understanding the text

11 How can a diet high in fibre benefit our health?

12 Why is bowel cancer considered a major health concern and how can individuals reduce the risk of developing this condition?

13 Explain the difference between insoluble fibre and soluble fibre and why each is important for good health.

14 Outline three ways you could increase the level of fibre in your diet.

15 How have food producers met consumers' need to improve the fibre content of processed foods?

16 What is osteoporosis?

17 Why is osteoporosis considered to be a major health concern in the community?

18 List the main reasons women are more likely to develop osteoporosis than men.

19 What are some strategies both men and women could implement to safeguard against osteoporosis?

20 Explain four ways of modifying the products or processes in meal preparation that could increase the level of calcium in the diet.

CULTURAL AND ETHICAL RESTRICTIONS

Over time, society develops a pattern or a particular way of doing things. This can include a language, a set of values and beliefs, which are the basis of a religion,



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Paella is a traditional Spanish recipe.

styles of art, music and drama, foods and mode of dress, and systems that organise government and the laws for the people. All these factors combine to create what is often described as the culture of a society.

Cultural heritage

In times past, the culinary characteristics of a community were determined by the physical setting or the geography of the country in which people lived. Some of the geographical factors that influence the eating habits of a regional group or country are climate, landform (mountainous or flat land) and the types of vegetation. The very rocky and mountainous land of Greece was suitable for growing olive trees and so olive oil plays a major role in Greek cooking. The Pacific Islands have an extensive coastline and very little open land for grazing cattle, so fish and seafood are a major part of their diet. Rice is the staple crop of many countries, particularly in Asia where an abundance of water is available to irrigate this crop.

The food habits of the people who settle in a country can have a major influence on the types of food eaten, how they are cooked and how they are served. South America was colonised by the Spanish and Portuguese, who introduced rice to these regions. In return, tomatoes, chillies, beans and potatoes were shipped across the seas to appear in dishes we would describe as traditionally Spanish.

Australian food has been very similar to the British diet for nearly 200 years. Our food habits have only expanded since the early 1950s as a result of the increased migration of people from countries other than Britain after World War II. Australia's cultural diversity means that we no longer follow the traditional eating habits of the early European settlers. Instead, we have embraced an exciting range of taste sensations brought by the many migrants to our shores. Chinese, Italian, Greek, Vietnamese, Indian and more lately North African and Sri Lankan foods are now widely enjoyed in the community. It is not unusual in many Australian homes to have a meal that originated from a different part of the world every night of the week. Also the term 'fusion cooking' is commonplace in Australian kitchens where creative cooks combine ingredients and use cooking methods from various cultures in a different way to make a new recipe.

Religious restrictions

For many people, the food they eat is very closely linked to their spiritual beliefs. Many faiths, including Christianity, Judaism, Islam, Hinduism and Buddhism, have strict rules and customs associated with food. Some foods can never be eaten, while others cannot be eaten on particular days or times of the year. Some religions have very specific rules about the preparation methods and to whom the food can be served. Some of the foods that may be restricted are seafood and pork.



iStock.com/Shaiith

Ingredients for Vietnamese rice paper rolls

Many Roman Catholic and Orthodox Christians, for example, avoid eating meat on Fridays or during Lent. Members of the Jewish community may follow the Jewish food law of only eating kosher food – the meat from animals must be slaughtered according to their customs. In Islamic communities food must be halal (permitted) according to their religion, and foods such as pork and brewer's yeast-based products are not permitted. Within the Hindu and Buddhists religions, some followers will not eat meat as it involves taking the life of an animal or causing it pain. Most Hindus avoid eating beef because the cow is considered a sacred animal. Therefore, when designing or adapting recipes and meals, these religious food restrictions must be taken into consideration.

Ethical food restrictions – vegetarianism

A vegetarian is a person who does not eat meat or other animal products. There is a wide range of reasons for following a **vegetarian diet**. A vegetarian diet consists of grains, pulses, nuts, seeds, vegetables and fruit. The diet does not include any meat, poultry, game, fish, shellfish or by-products of slaughter. The custom may be based on religious beliefs as is practised in Hindu and Buddhist sects, or it may be based on a person's ethical principles to avoid cruelty to animals or the view that there are more energy-efficient ways to produce food.

The health benefits of excluding animal products from the diet are well documented and show that there is a reduced consumption of saturated fats and cholesterol, which benefits heart health. From an economic point of view, non-meat products are often less expensive. **Vegans** have the most limited diet – they refuse to eat all animal-derived products, including butter, cheese, milk and eggs and they do not use any products such as leather that come from animals.



Australian Vegetarian Society (NSW)

Many vegetarians are concerned about animal welfare.

Activity 15.3

WS Worksheet

Meringue comparison – vegan and traditional

Aim: To compare the physical and sensory properties of meringues made from plant and animal protein. Eggs are usually a key ingredient in meringues, but the traditional recipe is not suitable for vegans. The protein in chickpea brine behaves similarly to egg whites when they are beaten – it stretches and captures bubbles of air, and sugar is used to sweeten and stabilise the foam.

Work in small teams to complete a comparison test of vegan meringues and traditional meringues. For the traditional meringues, substitute two egg whites for the chickpea brine in the recipe that follows.

Method

1. Produce one quantity of vegan meringues and one quantity of traditional meringues using the same recipe but substituting the chickpea brine with two egg whites.
2. During the production of each type of meringue, record the time taken to beat into a foam and then to form a stiff peak meringue.
3. Record the cooking time.

Results

	MERINGUE – CHICKPEA BRINE	MERINGUE – EGG WHITE
Time taken to beat into a foam		
Time taken to beat in sugar to form a stiff peak meringue		
Cooking time		
Sensory properties – appearance – aroma – flavour – texture		

Analysis

1. Was there a time difference in beating the chickpea brine and egg whites into a foam? Explain your answer.
2. Was there a time difference in the formation of stiff peak meringue between the plant and animal protein? Explain your results.
3. Did it take the same time to cook and dry out each type of meringue?
4. Discuss the similarities and differences in the sensory properties of the two types of meringue.
5. Explain why people who follow a vegan diet or have an allergy to eggs would be pleased with the chickpea variation of traditional meringues.

Conclusion

If you followed a vegan diet, would you be satisfied with the chickpea meringues as a sweet treat? If so, explain why; if not, explain why not.

Vegan meringues

80 millilitres liquid brine from canned chickpeas, at room temperature
¼ teaspoon cream of tartar
½ cup caster sugar
pinch of salt
½ teaspoon pure vanilla essence

Method

1. Preheat oven to 110 °C and line a baking tray with baking paper.

2 Combine the chickpea brine and the cream of tartar in a medium bowl. Use a hand-held beater and beat on high speed until the mixture begins to foam. This will take 1–2 minutes.

3 Continue beating and add the caster sugar, 1 tablespoon at a time – ensure it is completely dissolved before the next addition.

4 Add the salt and vanilla essence.

5 Continue beating until the mixture is glossy and stiff peaks form. This step will take about 7 minutes.

6 Place the meringue in a piping bag with a star nozzle and pipe onto the lined tray. The meringues should be 3–4 centimetres high.

7 Bake the meringues for 40–50 minutes then turn off the oven and let cool and continue to dry out for 30 to 40 minutes.

8 Store in an airtight container.



Alamy Stock Photo/Stockimo/EQ

A vegan meringue can be made with chickpea brine.

SUBSTITUTING INGREDIENTS FOR INDIVIDUALS WITH FOOD INTOLERANCES AND ALLERGIES

A food allergy is an abnormal immunological reaction to food caused by a foreign substance, usually protein, and can be life-threatening. Common food allergies include dairy, egg, seafood, nuts and soy.

A food intolerance is a chemical reaction to particular foods; it is not an immune response, so is not a true allergy. Common food intolerances include gluten and lactose intolerance.

When preparing foods for people with food intolerances and allergies it is essential to discuss the specific requirements with the person concerned. In some cases, it is possible to substitute ingredients so a product is safe for them to eat and still has pleasing sensory properties. In other cases, where ingredients cannot be eaten, for example prawns, then a completely different recipe should be prepared and served. Lists follow of some of the common food intolerances and allergies and possible substitutes you could use when designing and adapting recipes.

Dairy allergies

Foods usually containing dairy
Milks, cheeses, yoghurt, cream, ice-cream, chocolate, baked products, such as cakes, biscuits, pastry, butter and some margarines
Ingredients to avoid
Casein, whey, whey solids, buttermilk solids, curds, milk solids, lactalbumin, caseinate, sodium caseinate
Substitutes for dairy
For milk: soy, rice, almond, oat and coconut milk For butter: dairy-free margarine (most light margarines are not suitable for baking) For yoghurt: soy or coconut milk yoghurt

Egg allergies

Foods usually containing egg
Baked foods such as cakes, biscuits, muffins, breads, dry biscuits; desserts such as custards, puddings, ice-creams, meringues; battered and crumbed food, meatballs, pasta, sauces, dressings
Ingredients to avoid
Albumin, globulin, lysozyme, livetin, silici albuminate, Simplesse, vitellin, meringues, products with the word 'egg', such as egg white and ingredients that begin with 'ovo'
Substitutes for eggs
Eggs have several functional roles in baked products where they can act as a leavening agent, and provide structure and liquid to combine ingredients. Commercial egg replacer – this is whisked into water until fluffy then added to the baked product mixture Baking powder, water and oil – whisk together 1½ tablespoons oil, 1½ tablespoons warm water or milk and 1 teaspoon baking powder to assist in leavening a mixture Fruit purée – ¼ cup of mashed banana or thick stewed apple can provide moisture to combine ingredients

Seafood allergies

Foods usually containing fish or shellfish

Anything with fish or seafood, including imitation crab, Caesar salad and dressing, Worcestershire sauce, fish sauce, some pizzas, some gelatine, marshmallows, some sauces, antipasto items

Ingredients to avoid

All products that have the word 'fish' or 'seafood' in the ingredients list

There are NO substitutes for seafood – select alternative recipes and food products

Nut allergies

Foods usually containing nuts

Baked products, chocolate (may contain traces of nuts), some confectionary, snacks, nut spreads, breakfast cereal, Asian-style food (sti-fry sauces), vegetarian burgers and meat substitutes, marzipan

Ingredients to avoid

Spreads that contain nuts such as Nutella and peanut butter, marzipan, confectionary and chocolate with nuts, vegetarian substitutes for meat such as nut meat, many breakfast cereals, Asian foods often have nuts as ingredients and in the sauces, baked goods and cake mixes

Substitutes for nuts

It is safest to exclude all types of nuts as there is often cross-contamination during the processing of different varieties of nuts. For a similar crunch to nuts in a salad, sunflower or pumpkin seeds could be used.

Soy allergies

Foods usually containing soy

Baked products – cakes, biscuits, muffins and bread, cake mixes, breakfast cereals, frozen meals, margarines, snack foods, vegetable oils

Ingredients to avoid

Hydrolysed soy protein, miso, soy sauce, soy protein concentrates, soybean, soybean curd, tempeh, textured vegetable protein (TVP), tofu

Substitutes for soy

There are no substitution ingredients for soy and tofu. Different recipes need to be selected. It is important to read the labels of commercial products as soy is used widely in items you might not expect, such as some pasta sauces and bread.

Gluten intolerance

Foods usually containing gluten

Gluten is found in a range of commonly eaten foods, such as breads, pasta, pizza, cereals, cakes, biscuits and pies. It is also a common thickener in processed foods.

Ingredients to avoid

All products that are made from wheat, rye, oats, triticale and barley, including wheat flour, brewer's yeast, malt extract, soups, sauces, gravies and traditional soy sauce.

Substitutes for flour containing gluten

A wide range of gluten-free ingredients is now available, including gluten-free plain flour and self-raising flour, arrowroot flour, buckwheat flour, potato starch, quinoa flour, soy flour, white rice flour and tapioca flour.

Lactose intolerance

Foods usually containing lactose

Milk, milkshakes and other milk-based beverages, whipping cream, ice-cream, cheese, butter, puddings, custards, cream soups, cream sauces

Ingredients to avoid

Whey, curds, milk solids, malted milk, casein, whey protein concentrate, margarine, buttermilk, caseinate, lactalbumin

Substitutes for milk containing lactose

A wide range of lactose-free ingredients is now available, including fresh and UHT soy milks, yoghurts and ice-creams. Other milk varieties, including rice, coconut and almond milk are also widely available. Some low-lactose milk products are also available that may be suitable.

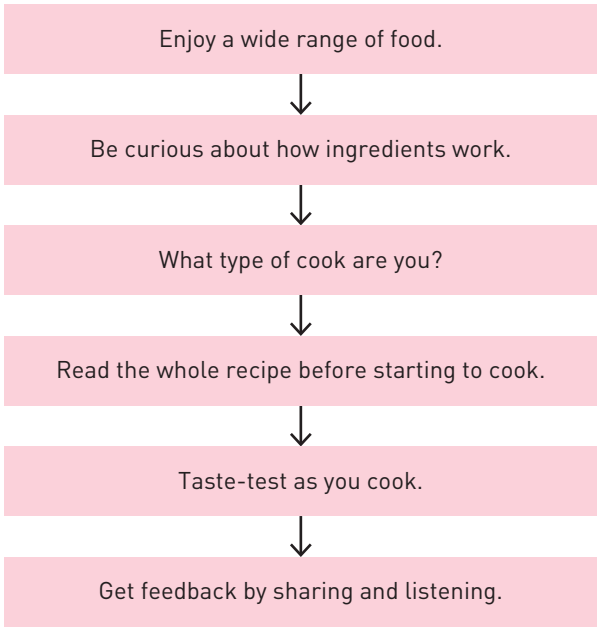


iStock.com/fuchs-photography

Accurate cutting skills are essential for a good cook.

Developing food skills and becoming a good cook

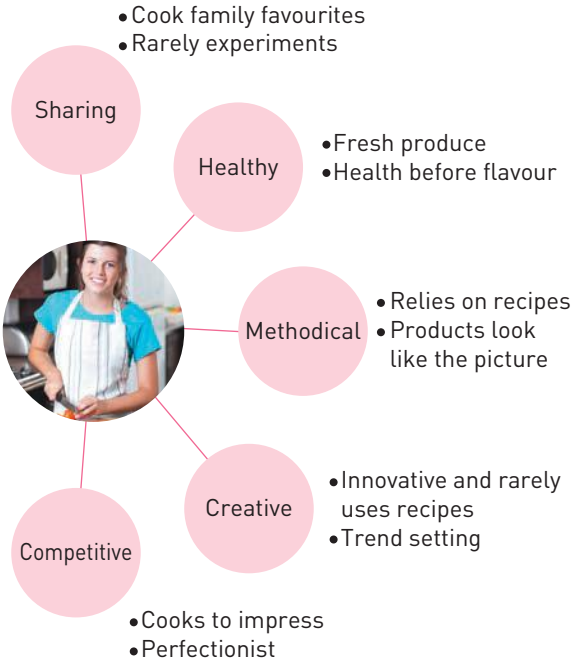
Understanding how to read a recipe, that is, the ingredients – the quantities and the order of the ingredients in the list – and how each step in the method works, is a good place to start for someone who wants to learn to cook. In reality, cooking is a system and once you know how to follow it, you can control and vary different stages of the process. Good cooks enjoy a wide range of foods and have fun when working in the kitchen. They are curious, want to try new ingredients and experiment with different cooking techniques. Learning to cook means you can control what you eat and the impact of food on your health.



Process of becoming a cook

WHAT TYPE OF COOK ARE YOU?

There are two types of cooks, those who measure and those who don't! People who bake are usually precise, measure accurately and organise the workflow in the kitchen methodically. This is because the ratio of ingredients for baked products, such as cakes, pastry and biscuits, must be exact to produce high-quality products. On the other hand, cooks who approach food preparation more intuitively and have a 'toss in the pot' approach, adding a bit of 'this', taste-test then adding a bit of 'that', tend to focus on meal preparation and steer away from complex baked products.



Characteristics of people who cook

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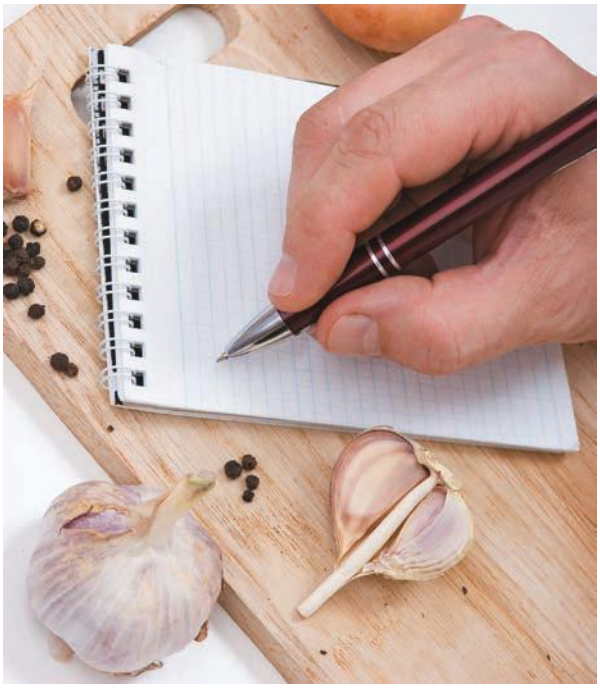
HOW TO BE A SUCCESSFUL COOK

Avoiding problems

Read the recipe all the way through before you start so that you know what the final product will be; otherwise you might think you are making a soup but the end product turns out to be a stew! Every word matters in a recipe. For example, chocolate melted on a low heat will have very different properties to chocolate melted on a high heat.

If you need to substitute an ingredient, consider what properties the new ingredient should have. Does the ingredient have a significant functional role in the recipe? Many cakes include eggs, which contribute to the volume and structure of the final product, so what substitute ingredient has these functional properties and could they be substituted for eggs if someone has an allergy to eggs or there are none left in the pantry? Maybe you want to reduce the fat content of a recipe so you change one cup of pure cream to one cup of light cream – will the final sensory properties be appealing?

Make notes on recipes as you go – record if you change quantities or steps in the method or how you improve the flavour so you don't forget next time you cook the recipe. Develop your knowledge about ingredients; for example, plain flour is the same as all-purpose flour, but different from bread flour or self-raising flour. When a recipe says 'season to taste' this is about you taste-testing then making adjustments to the salt and pepper to get the flavour balance just right.



AGE-fotostock/CSP tester

Make notes about a recipe

Be social and get feedback

Preparing, combining and cooking the ingredients in a recipe is a straightforward process and the talents of a creative cook really shine when they understand the chemistry that occurs during the production and how it influences the sensory properties of food. Cooks use sight to help judge when a product is cooked sufficiently or if the salad ingredients are fresh. The sense of smell is important to a cook as they can notice when changes are occurring during cooking. For example, there is a distinctive aroma when bread has finished baking or when sugar is caramelising and nearly burning. Tasting food is interlinked with smell so it is important to taste whether there is enough sugar in the syrup for the poached pears, or if the balance of salt and sugar in a tomato passata is appealing.



iStock.com/szefei

Sight, taste, smell and touch can all be used to identify whether noodles are cooked

Benefits of being a good cook

Serving and sharing food with others, either family and/or friends has social, emotional and economic benefits. Most people enjoy the chance to talk with family and friends, and sharing a meal is one opportunity to be sociable, to chat and eat at the same time. It provides a chance for cooks to discuss all the sensory properties of the food they have served. Guests can eat and talk together as well as provide the cook with feedback about what they liked and the changes to be made to improve the product. The reward for the cook is that sense of satisfaction, warm glow and feeling of emotional wellbeing when they share the food they cook.

The economic benefit of preparing meals at home is not clear-cut. On the positive side, seasonal ingredients prepared from scratch are usually cheaper, but there can be waste and the cook has to have the time and skills to prepare the recipe. However, meals cooked at home can be designed to meet different dietary needs more effectively than purchased pre-prepared meals. While many fast foods may appear to be cheaper than cooking from scratch, they are usually high in fat, sugar and salt, which if consumed too frequently, can lead to health problems. This type of food is also usually eaten on the run so there is little opportunity to sit and catch up with people in a social way.

Opportunities and pathways for the home cook

There are many examples of Australians with a passion for good food and great skills as a cook who have turned their hobby into a career. Some of our gourmet cheese producers started with a small herd of cows or goats and made enough produce for farm gate sales. They now supply other sectors of the food industry. Farmers' markets are where many home cooks sell their specialty products such as preserves and baked goods. All the competition cooking shows on television such as *MasterChef*, *My Kitchen Rules* and *The Great Australian Bake Off* are opportunities for home cooks to make the big time in the food world. People such as Poh Ling Yeow, Adam Liaw, Julie Goodwin and Marion Gadsby were all *MasterChef* contestants who started or developed their food careers as a result of their television exposure. These shows opened doors for them: for a recipe book deal, an appearance as a guest on a food and travel show, the support to develop a product line or a regular opportunity to write as a food critic.

Following are two examples of home cooks with a passion who demonstrate how they harnessed the food skills learnt at home and made their career.

KATHERINE SABBATH

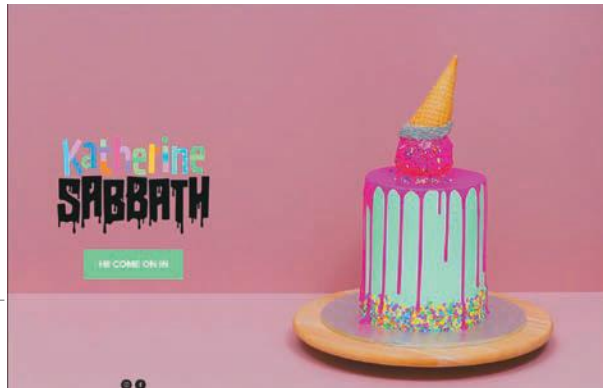


Photo with permission of Katherine Sabbath

Katherine Sabbath has established a successful career making spectacular cakes and desserts.

Katherine Sabbath is a self-taught cake baker. In 2015, she make the career move from an English and SOSE secondary school teacher to follow her passion and spend every day creating amazing, unique cakes and desserts. She says that she is now living 'the cake life' full-time. Katherine documents many of her recipes and loves sharing her candy-coloured food ideas with others. She joined Instagram in early 2013 and began posting photos of her cakes. Although not seeking fame, she has successfully used social media and websites to their full potential, which has resulted in an international cult following of more than 250 000, making her a household name among home bakers worldwide. Katherine's sweet treats are not an exact science. She rarely uses recipes; she chooses flavours based on what she feels like on the day and decorates with whatever is on hand. She holds workshops and demonstrations across Australia which book out quickly with her home-baking fans.



Photo with permission of Katherine Sabbath

Katherine Sabbath's ice-cream party cakes



Photo with permission of Katherine Sabbath

Katherine Sabbath with one of her celebration cakes

KEZ'S KITCHEN

Kez's Kitchen is a long-established family biscuit-baking business based in Melbourne. It began in 1991 when Kez would make her choc-chip cookies in the morning and sold them in the afternoon to local cafes. She and her mother Helen also made up gift hampers and sent them to local retailers and businesses to get their product range known. Eventually, as demand grew, they moved from their home kitchen to a purpose-built bakery in Noble Park, Melbourne. In 1994, Kez's brother, Michael, joined them and they put their hearts and souls into developing delicious biscuits.

Although Kez's Kitchen started supplying cafes, within five years the company was also suppling supermarkets, airlines such as Qantas and boardrooms across Australia. The ingredients for Kez's product range are wholesome and as many as possible are sourced locally. Everything the company makes is prepared and packaged in its Melbourne bakery. The company is committed to inclusiveness and individual differences so the majority of its products are certified halal and kosher.

One of the family members was gluten intolerant so the company looked on this as a marketing opportunity. It worked closely with customers and developed a gluten-free range of products that has grown and expanded beyond biscuits into cereals and snacks. A range of snack bars, which are gluten-free, made from all natural ingredients and have no added sugar, has also been developed.



Kez's Kitchen

Kez's Kitchen homepage



Kez's gluten- and dairy-free melting moments



Kez's Florentine cookies

Understanding the text

21 Explain how the culture of a community develops over time.

22 Outline two examples of the way in which cultural heritage or geography of a country can influence food customs.

23 Describe one factor that has led to the broadening of Australian tastes for ethnic flavours.

24 How does religion influence the cuisine some people eat? Give two examples to support your answer.

25 Explain how consuming a vegetarian diet could be considered ethical.

26 Outline how home cooks can adapt recipes to suit people with food intolerances and allergies. Provide two examples to support your answer.

27 Describe the process of developing food skills and becoming a good cook.

28 Explain how a cook can avoid problems in meal preparation.

29 What are the benefits of being a good home cook?

30 Select a home cook who has turned their passion for food into a career. Describe the pathway they took to reach their goal.

THINKING SKILLS

1 Do a quick survey of your class to determine the percentage of people who have a dietary restriction. Read the paragraph below and determine whether the percentage is similar to the percentage mentioned in the news report.

> In February 2016, *The Age* newspaper reported that 'Chef Shane Delia has been offering an extensive additional vegan menu at his Melbourne Middle Eastern restaurant Mahar for the last eight years. But in recent years the number and complexity of dietary requirements has increased, he says. "On any evening 30 per cent of our guests would have a dietary restriction or allergy of some sort, which is a lot".' (*The Age,* 6 February 2016)

2 Outline the evening meal you had last night then discuss if it would be suitable for a vegan. If not, explain how it could be modified so that it had good sensory properties as well as being within vegan guidelines.

3 If you had a guest who was lactose intolerant, consider how you would be able to modify the menu and the changes you would need to make.

RECIPES



iStock.com/Askold Romanov

Filo apple and dried fruit fingers

Fruit was an important food in early hunter-gatherer societies. Drying fruit for future use was also common in Mesopotamia. This recipe uses a combination of both fresh and dried fruit. The apple provides bulk and moisture, and balances the intense flavours of the dried fruit. The lemon adds a citrus zing to the filling. Baking is a dry method used to cook these sweet treats.

1 tablespoon currants
1 tablespoon sultanas
1 tablespoon raisins, chopped
1 tablespoon dried apricots, chopped
1 tablespoon almonds, blanched and slivered
1 Granny Smith apple, peeled, cored and grated
rind and juice of ½ lemon
1 tablespoon caster sugar
½ teaspoon cinnamon
8 sheets filo pastry
30 grams butter, melted
icing sugar for dusting

METHOD

1. Preheat oven to 200 °C.
2. Combine the dried fruits, almonds, apple, lemon rind and juice, sugar and cinnamon in a small bowl, and mix well.
3. Brush each sheet of filo pastry with melted butter and fold in half.
4. Brush with melted butter and fold in half again.
5. Cover the folded filo with a clean damp tea towel.
6. Divide the filling mixture between the eight sections of pastry.
7. Fold up the bottom of each and fold the sides in, then roll up to form a cylindrical shape.
8. Place each roll on the tray, so that the join is underneath.
9. Brush each roll with melted butter and cut three diagonal slashes with a sharp knife to prevent the fingers splitting when cooked.
10. Bake for 15–20 minutes or until golden brown.
11. Dust with icing sugar.

MAKES 8 FINGERS

EVALUATION

1. Describe the sensory properties of the finished filo apple and dried fruit fingers using descriptive language.
2. Why is the lemon juice and rind added to the filling mixture?
3. Make a list of other nuts that could be used instead of almonds in this recipe.
4. Why is it important to cover the filo pastry with a damp tea towel during preparation?
5. Suggest other ingredients that could be brushed onto filo pastry instead of butter.
6. Why is the finished roll slashed before cooking?
7. Sketch some other shapes that these ingredients could be wrapped into using filo pastry.
8. How would you store the filo apple and dried fruit fingers for use the next day and then restore their crisp texture after storage?
9. What is the health benefit of using filo pastry rather than puff pastry or flaky pastry?
10. Evaluate the nutritional properties of the filo pastry and the apple and dried fruit filling by plotting the ingredients on a diagram of the Australian Guide to Healthy Eating. Explain why pastry products should only be eaten occasionally and in small amounts.



Filo apple and dried fruit fingers

Crusty mixed seed loaf

Wheat was one of the first cereal crops to be domesticated and cultivated in the region of ancient Mesopotamia. This crusty mixed seed loaf uses a mixture of seeds and grains that would have been important ingredients in Mesopotamia. Yeast is the raising agent; it requires moisture, warmth and food to grow.

This product would be suitable to compare with a similar commercially produced loaf of bread.

---

1 cup white bread flour

1 cup multigrain flour

1 tablespoon sunflower seeds

1 tablespoon pumpkin seeds

½ teaspoon salt

¼ teaspoon sugar

1 teaspoon dried yeast

1 cup warm water

canola spray oil for greasing tray

TOPPING

egg/milk glaze

1 tablespoon sunflower seeds

1 tablespoon pumpkin seeds

METHOD

1. Preheat oven to 210 °C.
2. Place the seeds on an oven tray and toast in the oven for 5–10 minutes. Shake the tray during toasting to allow the seeds to brown lightly and evenly.
3. Sift flours, salt, sugar and yeast into a large bowl, add toasted seeds and make a well in the centre.
4. Add the warm water all at once and mix to a soft dough using a spatula.
5. Turn onto a lightly floured board and knead for 8–10 minutes, until dough is smooth and elastic.
6. Form into an oval, boat-shaped loaf; slash the top with diagonal cuts and place on the greased baking tray.
7. Cover lightly with a clean tea towel or oiled cling wrap and allow to prove in a warm place for 20 minutes.
8. Brush carefully with the egg and milk glaze and sprinkle with the topping seeds.
9. Bake in a hot oven at 210°C for 30 minutes or until loaf is golden-brown and sounds hollow when tapped.

MAKES ONE LOAF

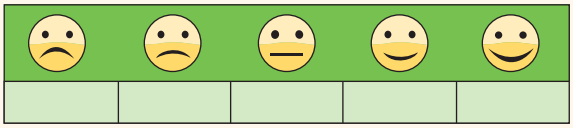
EVALUATION

1. Describe the sensory properties of the finished crusty mixed seed loaf using descriptive language.
2. Explain the impact of toasting the seeds in the oven on the sensory properties of the finished loaf of bread.
3. Outline two reasons for sifting the dry ingredients in step 3 of the recipe.
4. Describe the ideal conditions required for the growth of yeast.
5. Why is it important to use warm water to mix the dough rather than boiling water?
6. What impact does kneading have on the structure of the dough?
7. Why is it important to cover the dough with a clean tea towel or oiled cling wrap during proving?
8. Describe the changes that occur to the dough when proving.
9. What impact does brushing the dough with egg and milk have on the finished loaf of bread?
10. Explain why the bread loaf is cooked in a hot oven at 210°C rather than at 180°C.



Crusty mixed seed loaf

QUANTITATIVE RESULTS		
	HOMEMADE	COMMERCIAL
Name of product		
Manufacturer		
Serving size		
Weight per serve		
Colour of product		
Key ingredients		
Nutrients per 100 grams		
Cost		

QUALITATIVE RESULTS USING A PREFERENCE TEST		
	HOMEMADE	COMMERCIAL
Sensory descriptors		
Appearance		
Aroma		
Flavour		
Texture		
Ratings		
Nine-point scale 1 = dislikes very much 5 = neutral 9 = likes very much		
Facial hedonic descriptor		

Mini chicken and corn patties and bok choy salad

The mini chicken and corn patties are an example of a recipe that uses corn, which was an ancient grain grown in Mesoamerica.

Bok choy is a popular Asian green used in the salad. These recipes demonstrate the fusion of multicultural flavours.

Mini chicken and corn patties

200 grams minced chicken

100 grams corn kernels, drained, or the kernels cut from 1 cob cooked corn

½ cup fresh breadcrumbs

3 spring onions, finely sliced

⅓ cup parsley or coriander, finely chopped

1 tablespoon soy sauce

1 tablespoon cornflour

1 egg, lightly beaten

1 tablespoon oil

METHOD

1. Mix all of the ingredients, except the oil, together in a medium-sized bowl. If the mixture is too wet, add some extra breadcrumbs.
2. Mould the mixture into small rounds, about 1 tablespoon in size and flatten slightly. If they are too large, they will fall apart during cooking.
3. Refrigerate the patties for 10 minutes before frying.
4. Heat the oil in a frying pan and cook the patties thoroughly, turning only once. Take care when frying as the corn may spit and pop and cause a burn.
5. Drain on paper towel.
6. Serve the mini chicken and corn patties with the bok choy salad.

SERVES 2

Bok choy salad

½ bunch bok choy

10 grams butter

2 tablespoons pine nuts

2 spring onions, finely sliced

¼ packet Chinese fried noodles

DRESSING

¼ cup olive oil

2 tablespoons cider vinegar

1 tablespoon soy sauce

2 tablespoons brown sugar

METHOD

1. Wash the bok choy thoroughly, shake dry and shred finely.
2. Heat the butter in a small saucepan and sauté the pine nuts until just beginning to brown. Remove from the heat and drain on paper towel.
3. Sprinkle the sliced spring onions, pine nuts and Chinese fried noodles over the bok choy.
4. Prepare the dressing by mixing the olive oil, cider vinegar, soy sauce and brown sugar together in a small jug or screw-top jar.
5. Pour the dressing over the bok choy. Serve immediately.

SERVES 2



Mini chicken and corn patties and bok choy salad

EVALUATION

1 Describe the sensory properties of the finished mini chicken and corn patties and bok choy salad using descriptive language.
2 Explain the purpose of the breadcrumbs in the recipe for the mini chicken and corn patties.
3 Explain why it is important to refrigerate the patties for 10 minutes before frying.
4 How did you test whether the oil was hot enough for frying?
5 List four safety considerations to observe when cooking the mini chicken and corn patties in a frying pan.
6 Why is it important to wash the bok choy thoroughly before preparation?
7 Describe the effect of sautéing on the sensory properties of pine nuts.
8 Explain the function of each of the ingredients used in the salad dressing:
   - oil
   - vinegar
   - soy sauce
   - sugar.
9 What modifications could you make to the recipe for the bok choy salad if you were to make this recipe again in the future?
10 Plot the ingredients of the bok choy salad and mini chicken and corn patties on a diagram of the Australian Guide to Healthy Eating. Evaluate the nutritional value of the meal according to the guidelines of this food selection model.

Potato and spinach quesadillas

Quesadilla (pronounced 'keh-sah-*dee*-yah') is a flour tortilla filled with a savoury mixture, then folded in half to form a half-moon shape. It is a traditional recipe of Mexico. After the tortilla is filled and folded, it is fried or toasted, then cut into triangles or strips to serve as a snack or finger food. Cooking techniques such as roasting, steaming and frying are used in the preparation of quesadillas.

½ red capsicum

oil spray

1 medium waxy potato (approximately 125 grams)

2 tablespoons olive oil

½ medium red onion, thinly sliced

1 rasher bacon, diced

4 × 20-centimetre flour tortillas

salt and pepper

1 cup spinach leaves

½ cup grated tasty cheese

METHOD

1. Preheat oven to 200 °C. Line an oven tray with baking paper.
2. Remove the seeds and pith from the red capsicum and place it skin side up on the lined oven tray. Lightly spray with oil.
3. Roast for approximately 20 minutes, or until the skin has blistered and is starting to brown.
4. Remove from the oven, cover with foil and allow to cool. Remove the skin from the capsicum and cut into thin slices.
5. Cut the potato into slices 0.5 centimetre thick.
6. Bring water to the boil in the base of a steamer. Place the potato slices in the top of the steamer, cover with a lid and cook for approximately 10 minutes or until tender.
7. Heat 1 tablespoon of the olive oil in a frying pan and sauté the onion and bacon until the onion is soft and starting to brown, and the bacon is cooked.
8. Add the cooked potato slices to the onion and bacon and toss gently to coat in the oil and brown slightly. Take care that the slices do not break up.
9. Place one of the tortillas on a board and spoon a quarter of the onion, bacon and potatoes on one half, leaving approximately 1.5 centimetres of space around the curved edge. Season with salt and pepper.
10. Top with a quarter of the slices of roasted capsicum, spinach and finally a quarter of the grated cheese.
11. Brush the curved edge of the tortilla with a little water and fold the unfilled side over to form a lid. Press firmly around the edges.
12. Repeat the process with the remaining ingredients to make the other quesadillas.
13. Heat the remaining 1 tablespoon of oil in a clean frying pan. Place the filled quesadillas in the pan and cook over a medium heat for approximately 3–4 minutes or until browned underneath.
14. Turn carefully and cook the second side for a further 3–4 minutes until the cheese has melted and the base is brown.
15. Remove the quesadillas from the pan and cut into triangles. Serve warm.

MAKES 4 QUESADILLAS



EVALUATION

1 Describe the sensory properties of the finished potato and spinach quesadillas using descriptive language.

2 Describe how roasting changes the sensory properties of the red capsicum – appearance, aroma, flavour and texture.

3 Explain why potatoes are always cooked before eating.

4 Sketch and annotate a diagram to explain how steaming cooks the slices of potato.

5 How does double-cooking the potato – steaming and frying – improve the sensory properties of the potatoes?

6 Define the cooking term 'sauté'.

7 Quesadillas are a traditional South American food. What are some other ingredients that could be used to fill the tortilla?

8 Identify two safe work practices you followed during these aspects of production:
- roasting the capsicum
- cutting the onion
- frying the onion and bacon
- grating the cheese.

9 Reflect on the production and eating of the quesadillas and comment on:
- your skill level in frying
- your time management in completing the production
- the quality of the sensory properties of the cooked quesadillas
- possible improvements if you were to make the quesadillas again.

10 Plot the ingredients for the quesadillas on a diagram of the Australian Guide to Healthy Eating and make a judgement about their nutritional value as a snack food.

Quinoa, brown rice and roasted carrot salad

This salad is made with quinoa, an ancient grain from Peru and Bolivia. The combination of quinoa, which is high in protein, folate, iron, zinc, magnesium and calcium, and wholemeal rice makes this a very nutritious dish. Roasting the carrot in the spices provides a great contrast to the subtle flavour of the quinoa. This salad can be used as a base for the quinoa crumbed chicken tenderloins.

½ cup brown rice
1 large carrot
2 teaspoons olive oil
1 tablespoon honey
½ teaspoon ground cumin
¼ cup quinoa
1 tablespoon almonds or pistachios
½ lemon, zest and juice
50 gram marinated feta, crumbled
½ cup mint leaves

DRESSING

2 tablespoons olive oil
½ teaspoon sweet paprika
½ teaspoon ground cumin
juice from ½ lemon
1 tablespoon honey

METHOD

To cook the quinoa

1 Boil the rice in 1½ litres of water for 25 minutes or until the grain is tender. Drain and set aside.
2 Preheat oven to 200 °C. Peel the carrot and slice thinly on the diagonal then toss to coat with olive oil, honey and cumin. Place in single layer on a lined baking tray and roast for 15 minutes. Turn the carrot slices after 10 minutes. Remove from the oven when they begin to caramelise, and set aside.
3 To cook the quinoa, select a small saucepan with a tight-fitting lid, add the grains and ¾ cup of water. Bring to the boil, cover and reduce heat to simmer. The quinoa is cooked when the water has been absorbed – about 15 minutes. Drain to ensure all the moisture is removed.
4 Spread the almonds or pistachios on a tray and toast for 5 minutes. Cool and roughly chop.

To make the dressing

1 Heat the oil and spices over low heat for 1 minute or until they become fragrant.
2 Remove from heat and stir in lemon juice and honey.

Assembling the salad

1 Combine the roast carrot, brown rice, quinoa, lemon zest, feta and almonds or pistachios and toss together. Stir through the dressing.
2 Spoon into serving bowl and sprinkle with mint leaves.

SERVES 2



Quinoa, brown rice and roasted carrot salad

EVALUATION

1 Describe the sensory properties of the finished quinoa, brown rice and roasted carrot salad using descriptive language.
2 Explain the meaning of the term 'caramelise'.
3 Explain why brown rice takes longer to cook than white rice.
4 The rice in this recipe uses the moist method of boiling. Define the term 'boiling'.
5 What is quinoa and where did it originate? Explain why it has become such a popular grain.
6 Describe the change in the physical properties of the quinoa when it was cooked.
7 Why is it important to only cook nuts such as almonds for a short time?
8 Outline three rules for cooking safely on a cooktop.
9 Explain why the spices are fried in the oil when preparing the dressing for the salad.
10 The dressing for the salad is described as a temporary emulsion. Explain the meaning of the term 'temporary emulsion'.

Quinoa crumbed chicken tenderloins

This recipe is gluten-free and it is suitable for crumbing foods such as chicken tenderloins and fillets of fish that are not too thick so they cook quickly when shallow-fried. The quinoa flakes add crunch and flavour to the recipe. You can replace the chicken tenderloins with four fillets of white fish such as flathead.

6 chicken tenderloins

1 cup quinoa flakes

¼ grated parmesan cheese

2 tablespoons parsley, finely chopped

zest of ½ lemon

2 tablespoons rice flour

1 egg

¼ cup milk

3–4 tablespoons olive oil for frying

METHOD

1. Place the chicken between two sheets of baking paper and use a rolling pin to gently flatten the chicken so it is even in thickness.
2. Place the quinoa flakes, parmesan cheese, parsley and lemon zest into a bowl and whiz with a hand-held stick mixer until fine crumbs are formed. Transfer to a plate for crumbing.
3. Place the rice flour and chicken tenderloins in a plastic bag and shake to coat the chicken.
4. Whisk the egg and milk in a bowl.
5. Dip the coated chicken in the egg and milk, one at a time, then coat with the crumb mixture. Place on a tray lined with baking paper. Repeat the process until all the chicken is coated.
6. Cover the tray lightly with cling wrap and refrigerate for 20 to 30 minutes before frying.
7. In a frying pan, heat the oil over medium heat and fry the crumbed chicken for 2 to 3 minutes on each side. Drain on paper towel before serving.

SERVES 2



EVALUATION

1 Describe the sensory properties of the finished quinoa crumbed chicken tenderloins using descriptive language.

2 Outline two food safety practices you followed when preparing the raw chicken to prevent food poisoning.

3 Explain how you were able to zest the lemon safely.

4 Describe two safe work practices you followed when using and cleaning the stick mixer or processor.

5 What impact will rolling the chicken tenderloins to an even thickness have on cooking the chicken and on the sensory properties of the finished recipe?

6 Why is it important to allow the crumbed chicken tenderloins to rest in the refrigerator for 20–30 minutes before frying?

7 The chicken tenderloins are cooked by shallow-frying. Explain the difference between shallow-frying and deep-frying.

8 Outline the benefits of using quinoa rather than breadcrumbs to coat the chicken tenderloins.

9 List and justify two vegetable dishes that could be served with the quinoa crumbed chicken tenderloins for a healthy family meal.

10 Evaluate the nutritional properties of a meal that includes the quinoa crumbed chicken tenderloins served with quinoa, brown rice and roasted carrot salad by plotting the ingredients on a diagram of the Australian Guide to Healthy Eating.

Quinoa burgers

A combination of lentils, quinoa and white beans is used to make the patties for these flavoursome vegetarian burgers. The ricotta, feta and egg not only help to combine the ingredients, but they also add to the protein content of the burgers. Quinoa is also high in protein and dietary fibre, making these burgers a very nutritious meal.

¼ cup brown or small green lentils
¼ cup quinoa
1 tablespoon olive oil
½ onion, finely diced
1 clove garlic, crushed
½ cup canned white beans, rinsed and drained
½ egg, lightly beaten
1 tablespoon parsley, finely chopped
salt and pepper to taste
50 grams feta
60 grams ricotta
2 tablespoons olive oil
4 small burger buns
lettuce leaves
tomato relish or sauce

METHOD

1. To cook the lentils: place the lentils in a small saucepan and cover with 2 cups of cold water. Bring to boil and simmer for 20 minutes or just tender to bite. Drain and cool.
2. To cook the quinoa: select a small saucepan with a tight-fitting lid and add the grain and ¾ cup of water. Bring to the boil, cover and reduce heat to simmer. The quinoa is cooked when the water has been absorbed – about 15 minutes. Drain to ensure all the moisture has been removed.
3. Heat 1 tablespoon of oil in a frying pan over medium heat and sauté the onion until tender but not brown. Add the garlic and cook for 1 minute. Remove from heat and cool.
4. In a food processor, add the cooked lentils and quinoa, drained white beans, cooked onion and garlic, beaten egg, chopped parsley and salt and pepper. Pulse until a thick paste is formed.
5. Shape the mixture into six patties and place on a lined tray. Cover with cling wrap and refrigerate for 30 minutes.
6. Crumble the feta cheese then add the ricotta, mix together and set aside.
7. Preheat oven to 180°C.
8. Heat the olive oil in a frypan and cook the patties for 3–4 minutes on each side until golden brown. Transfer to an oven tray and cook for 8–10 minutes until cooked through.
9. Split the burger buns and spread with the cheese mixture. Add the patties, lettuce leaves and tomato relish or sauce.

SERVE 2–4

EVALUATION

1 Describe the sensory properties of the finished quinoa burgers using descriptive language.
2 Draw a diagram to demonstrate how to dice an onion safely.
3 Describe the difference in the physical properties of feta cheese and ricotta cheese.
4 Cooking the quinoa uses two moist methods of cooking – boiling and simmering. Explain the difference between boiling and simmering.
5 Explain the meaning of the term 'sauté'.
6 Why is the garlic cooked for 1 minute in step 3 of the recipe?
7 Explain how you could prepare the mixture for the patties if you did not have a food processor.
8 Why is it important to refrigerate the quinoa patties for 30 minutes before frying?
9 Explain why the patties are transferred to the oven to complete their cooking rather than continuing to cook them in the frying pan.
10 Evaluate the nutritional properties of the quinoa burgers by plotting the ingredients on a diagram of the Australian Guide to Healthy Eating.



Quinoa burger

Potato and bacon pancake stacks

Potatoes were one of the first crops grown and traded throughout the Americas. In this recipe, the steamed mashed potatoes are lightened with beaten egg white to produce a very airy, delicate pancake. The addition of eggs and milk to the recipe provides a source of protein and some calcium. Remember to use the butter and oil sparingly when frying the pancakes to minimise the amount of fat consumed. The pancakes could also be topped with sautéed mushrooms and capsicum or a poached egg instead of bacon to reduce the fat content.

2 small potatoes

¼ cup milk

2 eggs

¼ cup self-raising flour

salt and pepper

1 tablespoon butter, melted

1 tablespoon oil

4 rashers bacon

4 tablespoons maple syrup

METHOD

1. Peel the potatoes and cut into quarters.
2. Steam for approximately 12–15 minutes or until tender, or cook in the microwave.
3. Mash the potatoes well and add the milk. Use a spatula and stir until smooth.
4. Separate the yolks from the whites of the eggs. Sift the flour and salt and pepper.
5. Using a spatula, fold the egg yolks and sifted flour into the mashed potato.
6. Beat the egg whites with a hand-held whisk until soft peaks form.
7. Gently fold the beaten egg whites through the potato mixture with a spatula.
8. Preheat oven to 100°C.
9. Combine the melted butter and oil. Using a pastry brush, lightly brush a little melted butter and oil over the surface of a non-stick frying pan.
10. Add approximately ⅓ cup of batter to the pan and cook the potato pancakes for about 2 minutes. Turn carefully using an egg lifter. Cook for a further 2 minutes or until golden brown and slightly puffed.
11. Remove from the pan and keep warm in the preheated oven. Add a further small amount of the butter and oil to the pan and cook the remaining pancakes.
12. Cut the bacon into strips and grill or pan-fry until crisp.
13. Stack two or three pancakes on top of each other and top with crispy bacon. Drizzle with a little maple syrup. Serve warm.

MAKES 2 × 3 STACKS

EVALUATION

1 Describe the sensory properties of the finished potato and bacon pancake stacks using descriptive language.
2 What variety of potatoes would be best suited to mash in this recipe?
3 Identify two pieces of equipment suitable for mashing potatoes.
4 What are the functional roles of the egg yolk and the egg white in this recipe?
5 Describe two conditions necessary to produce maximum volume when beating egg whites.
6 Why is it important to fold the egg whites into the potato mixture gently?
7 Explain why it is necessary to use a mixture of butter and oil to cook the potato and bacon stacks.
8 Why is it recommended that you keep the potato pancakes warm while the remainder are cooked?
9 Did you grill or pan-fry the bacon? What was the reason for this decision?
10 Plot the ingredients for the potato and bacon pancake stacks on a diagram of the Australian Guide to Healthy Eating. Comment on their nutritional value as a snack food.



Potato and bacon pancake stacks

Hot cross buns

Hot cross buns are traditionally linked with Easter celebrations. Traditionally, they were baked and eaten on Good Friday. The dried fruit in the buns is similar to the dried fruit grown throughout Mesopotamia; it would have been dried on rocks in the sun to preserve it. The oats in this recipe add fibre to the buns and keep them moist. The sweet, spiced bun mix can be adapted to other sweet dough recipes such as those for scrolls or a sweet plait.

BUNS

40 grams butter

approximately 300 millilitres warm water

¼ cup quick oats

2½ cups bread flour

1 tablespoon freeze-dried yeast

2 teaspoons bread improver

1 teaspoon salt

2 tablespoons sugar

½ teaspoon cinnamon

1 teaspoon mixed spice

2 tablespoons skim milk powder

½ cup sultanas

1 egg, beaten

½ teaspoon oil

PIPING

3 tablespoons plain flour

2 tablespoons caster sugar

1½ tablespoons water

BUN GLAZE

¼ cup sugar

¼ cup water

1 teaspoon gelatine

1 teaspoon mixed spice

METHOD

Making the dough

1 Melt the butter in 100 millilitres of the water in a small saucepan. Bring to the boil. Remove from the heat, add the oats and stir gently.
2 Sift all of the dry ingredients together in a large bowl.
3 Add the sultanas to the flour mixture.
4 Add the butter, oats and water mixture, egg and oil to the dry ingredients, along with enough of the remaining warm water to mix to a soft dough.
5 Cover with cling wrap and leave to prove in a warm place until doubled in size.
6 Turn onto a floured board and knead lightly.
7 Divide the dough into 12 even pieces and knead and shape each into a bun. Place on a greased oven tray.
8 Cover loosely with cling wrap and prove in a warm place for 10 minutes or until doubled in size.

Making the piping mixture and baking

1 Make the piping mixture by mixing the flour and sugar together with the water until a smooth, thick paste. Pipe a cross on the top of each bun.
2 Bake in the preheated oven at 200°C for 10 minutes. Reduce the temperature to 180°C and continue cooking for a further 5–10 minutes or until golden brown.

Making the glaze

1 Make the bun glaze by combining all of the ingredients in a small saucepan. Stir over heat and bring to the boil.
2 Brush the glaze over the buns.

MAKES 12 HOT CROSS BUNS

EVALUATION

1 Describe the sensory properties of the finished hot cross buns using descriptive language.
2 What is bread flour and why is it used in this recipe?
3 Explain the purpose of mixing the quick oats in warm water before adding it to the dry ingredients.
4 What is the purpose of the yeast in this recipe?
5 Explain the role of the milk, egg, melted butter and water in making the dough.
6 Draw a flow chart to explain the changes that take place in the dough when it is left to prove in step 5 of the recipe.
7 What does the term 'kneading' mean and why is this an important step in yeast baking?
8 Explain why the recipe recommends cooking the buns first at 200°C before reducing the temperature to 180°C.
9 Observe and note three changes in the buns when they are baked in the oven.
10 List two rules for using the oven safely.



Hot cross buns

Spiced rice

Three methods of cooking spiced rice

Spiced rice can be used to accompany a curry, meat or vegetable kebabs or chargrilled chicken, or as a light lunch dish with yoghurt and mango chutney. It can be cooked in a microwave oven, on the cooktop or in a rice cooker.

Work in small teams to prepare the rice by each of the three methods.

Note: The cooking time and amount of water may vary slightly between methods.

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1 tablespoon vegetable oil

½ onion, finely diced

½ teaspoon mustard seeds

½ stick cinnamon

1 star anise

3 cloves

1 cardamom pod, bruised

¼ teaspoon turmeric

1 cup basmati rice, washed and drained

2 teaspoons pistachio nuts or roasted cashews

2 teaspoons sultanas

1 piece thin orange peel, without the pith

1¾ cups water

pinch of salt

METHOD

Microwave method

1. In a microwave-proof bowl, heat oil on high for 30 seconds.
2. Add onion and spices and cook on high for about 2 minutes or until the onion is soft.
3. Add the rice, nuts, sultanas, orange peel, water and salt.
4. Cook uncovered for 15–20 minutes on high. After 12 minutes, check and stir with a fork. Add more water if necessary. Cover and stand for 5 minutes before fluffing with a fork.

Rice cooker method

1. In a frying pan, gently heat oil then add onion and sauté for 3 minutes without browning. Add spices and cook for a further 30 seconds.
2. Transfer the spiced onion to the rice cooker and add the washed rice, nuts, sultanas, orange peel, salt and 1¾ cups of water.
3. Put the lid on the cooker and turn on. Allow to rest for 10 minutes once the cooking time is complete.
4. Fluff up with a plastic spatula and serve.

Absorption method

1. Select a medium-sized saucepan with a tight-fitting lid.
2. Gently heat oil then add onion and sauté for 3 minutes without browning. Add spices and cook for a further 30 seconds.
3. Add the washed rice, nuts, sultanas, orange peel, salt and water.
4. Put the lid on the saucepan, bring to the boil for 1–2 minutes then reduce heat to the lowest possible temperature. Cook for 10 minutes or until the water has been absorbed. Remove from heat.
5. Sit closed saucepan on a damp dishcloth and rest for 10 minutes. This will prevent the rice sticking on the bottom of the saucepan.
6. Fluff up with a fork and serve.

SERVES 2–3

EVALUATION

1 Describe the sensory properties of the finished spiced rice using descriptive language.

2 Was there a difference in the cooked volume of the three spiced rice dishes? Discuss.

3 Use a table like the one below to describe the texture of rice cooked by each method. Was it tender, hard, gluggy? Were the rice grains separate or did they stick together?

	TENDERNESS	GLUGGINESS	GRAIN SEPARATION
Microwave			
Rice cooker			
Absorption			

4 What sensory property of the dish is improved by washing the rice before cooking?

5 Why is it important to rest the rice before serving?

6 Which method of cooking produced the best quality dish? Explain your answer.

7 Discuss the advantages and disadvantages of each method of cooking the spiced rice.

8 Identify one safe work practice that is specific to each method of cooking used for the spiced rice.

9 Describe how you would safely store the spiced rice if you had any leftovers.

10 List four recipes that include protein and vegetables that could be served with the spiced rice to produce a healthy family meal.



Spiced rice

Methods of cooking rice

Rice is usually cooked in one of four ways, depending on its final use in a recipe.

Rapid boil method

Bring a large saucepan of water to the boil. Add one-third of a cup of rice per person. Stir once or twice only. Boil the rice uncovered for 15 minutes. Drain the rice through a sieve and rinse under running water. Allow the rice to drain completely.

Absorption method

Allow one cup of rice to three-quarters of a cup of stock or water. Place the rice and stock or water into a saucepan that has a tight-fitting lid. Bring the rice to the boil. Reduce the heat to very low and allow the rice to simmer gently for 15 minutes. Remove from the heat and allow the rice to rest for 10 minutes.

Microwave

Rice can be cooked successfully in a microwave oven. Read the instructions on the packet of rice as cooking times vary for different varieties. Also, remember to check the instructions in your microwave manual as power levels vary considerably between models.

Rice cooker

Use equal quantities of rice to water. Rinse the rice and place in the rice cooker. Add the water and switch on the cooker. Allow the rice to rest for 10 minutes when the rice cooker has switched off and the cooking is complete. Some rice cookers have a warming element, which keeps the rice warm for several hours.



Rice cooked in a rice cooker

Oaty choc-chip biscuits

These biscuits combine the nutty flavour of hazelnuts with the richness of chocolate. The butter and oats give them good keeping qualities. Oats were one of the important grains grown in Mesopotamia and chocolate was one of the first foods to be traded worldwide. Oats are a healthy cereal as they are high in soluble fibre.

70 grams hazelnuts
60 grams unsalted butter, softened
¼ cup caster sugar
¼ cup brown sugar
1 small egg, beaten
¼ teaspoon vanilla essence
½ cup rolled oats
½ cup plain flour
¼ teaspoon baking powder
¼ teaspoon bicarbonate of soda
50 grams good-quality dark chocolate, chopped



Oaty choc-chip biscuits

METHOD

1. Preheat oven to 170°C. Line a baking tray with baking paper. Toast hazelnuts in the oven for 5–6 minutes until golden brown.
2. Remove nuts from oven and place on a clean, dry tea towel. Fold the tea towel in half and rub the hazelnuts to remove the skins. Allow to cool. Chop roughly with a large knife.
3. Place butter, caster sugar and brown sugar in a large bowl and beat until the mixture is light and fluffy.
4. Beat in the egg and vanilla essence until just combined then fold through the rolled oats.
5. Sift the flour, baking powder and bicarbonate of soda and fold into the mixture.
6. When almost incorporated, stir in the chocolate and chopped nuts.
7. Place heaped teaspoons of mixture on the lined baking trays. They should be about 4 centimetres apart to allow for spread during baking. Slightly flatten the teaspoons of mixture.
8. Bake for approximately 10 minutes or until golden brown. The biscuits will feel soft straight from the oven, but will crisp as they cool on the tray.

MAKES 12–14 BISCUITS

EVALUATION

1. Describe the sensory properties of the finished oaty choc-chip biscuits using descriptive language.
2. Why is dark chocolate selected for use in this recipe?
3. Why is it important to toast the hazelnuts before using them to make the biscuits?
4. What is the name of the process of beating the butter and sugar together until light and fluffy? How does this affect the sensory properties of the finished biscuits?
5. What role does the baking powder and the bicarbonate of soda play in the biscuit mixture?
6. Why is it important to sift the flour, baking powder and bicarbonate of soda before folding into the mixture?
7. Why is it important to space the biscuits on the tray before cooking?
8. What would happen if the biscuits were removed from the tray immediately after cooking?
9. Explain how you would store the biscuits.
10. Describe safety precautions that would need to be undertaken when using the oven for toasting the hazelnuts and cooking the biscuits.

Ricotta curry

Ricotta is a non-melting cheese and when it is cooked it becomes firm and dry so it can be fried before adding to curry sauce. Acid is used to form the curd when making ricotta, whereas rennet is used to set the curd for melting cheeses. When the ricotta is fried, the heat coagulates the proteins and forces the water from the cheese. Browning is due to the Maillard reactions.

400–500 gram wedge of ricotta
1 onion, diced
2 cloves garlic, crushed
2 centimetres fresh ginger, peeled and chopped
1 tablespoon oil
4 curry leaves
2 tablespoons curry powder
½ teaspoon salt
2 tablespoons tomato paste
200 millilitres water
2 potatoes
1 small sweet potato
180 millilitres coconut milk
1 cup frozen peas
oil for frying
fragrant rice for serving

METHOD

1. Place the wedge of ricotta on paper towel and allow to drain. Cut the ricotta into 2.5-centimetre cubes.
2. Use a food mill to blend the onion, garlic and ginger into a paste.
3. Heat 1 tablespoon of oil in a saucepan. Add the onion paste and sauté or cook gently for 5–10 minutes. The paste should be a pale golden colour, not dark brown.
4. Stir in curry leaves, curry powder and salt, and cook for a few minutes. Add the tomato paste and water and stir through. Increase heat so the mixture simmers.
5. Peel the potatoes and sweet potatoes and cut into 1-centimetre cubes, then add to curry mixture. Cover saucepan and cook until potatoes are just tender. Stir occasionally.
6. In a separate frying pan, heat enough oil to cover the bottom of the pan and fry off the cubes of ricotta in batches until golden brown. Turn the cubes of ricotta gently as they might break. Drain on a paper towel.
7. When the potatoes in the curry are tender, stir in the coconut milk. Add the peas and cook for 2 minutes. Gently stir in the ricotta and cook until heated through.
8. Remove from heat and serve with fragrant rice.

SERVES 2

EVALUATION

1 Describe the sensory properties of the finished ricotta curry using descriptive language.
2 If a food mill was not available, how could the onion, garlic and ginger be made into a paste?
3 Explain how sautéing the onion paste contributed to the sensory properties of the end product.
4 Suggest another root vegetable or fruit that could be substituted for the sweet potato in the ricotta curry.
5 Why is the ricotta curry simmered, rather than boiled?
6 Describe how you tested the oil to check if it was hot enough to fry the cubes of ricotta.
7 Why was the ricotta fried off in batches rather than all together?
8 Identify safe work practices that you followed when frying the ricotta cheese for the curry.
9 Describe the most successful aspects of this production and outline areas for improvement in your next practical session.
10 Evaluate the nutritional properties of the ricotta curry by plotting the ingredients on a diagram of the Australian Guide to Healthy Eating.



Ricotta curry

Sweet corn and bacon quiche

Recipes that can be prepared in advance and simply reheated are time-saving for a busy family. The following recipe for sweet corn and bacon quiche is a great example of a recipe that can be prepared in advance. The pastry case for this recipe can be made well ahead of time and chilled or even frozen until needed. The whole quiche can be easily reheated or is just as delicious served cold.

SHORTCRUST PASTRY

125 grams flour

2 tablespoons self-raising flour

pinch of salt

90 grams butter, at room temperature

1 egg yolk

1–2 tablespoons iced water

SWEET CORN AND BACON FILLING

½ onion, finely diced

2 rashers bacon, finely diced

2 teaspoons olive oil

½ cup drained canned corn kernels

⅓ cup sour cream

¼ cup milk

2 eggs

½ cup tasty cheese, grated

2 teaspoons parsley, finely chopped

METHOD

Making the shortcrust pastry

1 Sift flours and salt into large bowl.
2 Cut the butter into small pieces then rub into the flour with fingertips. Lift your hands high to aerate the mixture. Continue rubbing in until the mixture resembles fresh breadcrumbs. Alternatively, the rubbing-in process can be done in a food processor.
3 Combine the egg yolk and iced water and sprinkle over the flour mixture. Use a metal spatula to cut through the mixture to bring the ingredients together.
4 Use your fingertips to bring the dough together, adding a little more iced water if required. The pastry should leave the bowl clean.
5 Cover the pastry with cling wrap and rest in the refrigerator for 30 minutes. Use as required.

WILL LINE AN 18- TO 20-CENTIMETRE FLAN TIN

Making the sweet corn and bacon filling

1 Preheat oven to 200°C.
2 Roll out pastry and line an 18-centimetre foil pie flan. Cover pastry with baking paper and fill with loading such as dried beans or rice.
3 Place pie flan on baking tray and bake for 7 minutes. Remove loading and baking paper and bake for another 7 minutes.
4 Sauté the onion and bacon in the oil, then cool and combine with corn. Spread the mixture over the blind-baked pastry case.
5 Whisk together the sour cream, milk and eggs, then pour into the pastry case.
6 Sprinkle the grated cheese and parsley over the top and bake for 20–30 minutes or until golden brown and the filling has set.

SERVES 2–3

EVALUATION

1 Describe the sensory properties of the finished sweet corn and bacon quiche using descriptive language.
2 Why is the butter rubbed into the flour when making pastry?
3 What is the advantage of using a food processor to rub the butter into the flour instead of using your hands?
4 Explain the importance of resting the pastry in the refrigerator before rolling out.
5 Why is loading placed in the pastry case during the first stage of baking?
6 What is the purpose of blind baking the pastry before adding the filling?
7 Describe safe practices for dicing the onion and bacon.
8 Describe the changes that occur in the egg mixture that alter the physical properties of the filling.
9 Discuss the steps in this production that you found most challenging.
10 Evaluate the nutritional properties of the sweet corn and bacon quiche by plotting the ingredients on a diagram of the Australian Guide to Healthy Eating. Explain why products such as this should only be eaten occasionally.



Sweet corn and bacon quiche

Fruit tartlets

Tartlets are delicious to serve for morning or afternoon tea, or as an individual dessert. The custard filling sets firm as a result of gelatinisation and coagulation. Seasonal fruit is used for the topping.

PASTRY

225 grams plain flour

75 grams self-raising flour

55 grams icing sugar

150 grams chilled butter, cubed

1 egg yolk

2½ tablespoons iced water

loading, such as rice or lentils, for blind baking

CUSTARD FILLING

1 tablespoon cornflour

1 tablespoon custard powder

2 tablespoons caster sugar

1¼ cups milk

1 egg

1 teaspoon vanilla essence

TOPPING OPTIONS

small quantity of fruits in season; for example, strawberries, kiwi fruit, banana, pineapple, orange or mandarin segments, or canned fruit such as peaches, pears and pineapple

GLAZE

2 teaspoons arrowroot

½ cup water

pink food colouring

1 teaspoon sugar

METHOD

Making the pastry cases

1 Preheat oven to 180°C.

2 Combine flours, icing sugar and butter in a food processor and pulse until the mixture resembles fine breadcrumbs.

3 Add egg yolk and iced water and, using the pulse button, process until the mixture starts to come together.

4 Transfer mixture into a bowl and bring pastry together with your hands. Do not knead. Cover with cling wrap and refrigerate for at least 30 minutes.

5 Cut the pastry into half and shape into two balls. Roll out each ball of pastry on a lightly floured surface or between two sheets of baking paper, to 3 millimetres thick.

6 Lift the pastry and fit into each of the flan tins. Do not trim the pastry at this stage.

7 Place a sheet of baking paper into each pastry case. Fill with the loading.

8 Blind bake at 180°C for approximately 10 minutes or until a pale golden colour. Remove the loading and return the flan tins to the oven for a further 5 minutes.

9 Allow the pastry to cool in the tin. Trim any excess pastry with a sharp knife.

Will line 2 × 10 centimetre flan tins, or cut into 40 rounds using a 5-centimetre diameter cutter for individual tartlets.

Making the custard filling

1 Combine the cornflour, custard powder and sugar in a bowl and blend to a paste with ¼ cup of the milk.

2 Heat the remaining 1 cup of milk to just below boiling point. Pour onto the blended flours, stirring continuously with a wooden spoon.

3 Return the mixture to the saucepan and stir constantly over a low heat until the mixture boils and thickens. Remove the saucepan from the heat.

4 Beat in the egg. Add the vanilla and beat the mixture until it is glossy and smooth. The heat of the custard will cook the egg.

5 Spoon the cooled custard into the baked flan cases.

Adding the topping and glaze

1 Cut the fruits and arrange them creatively on top of the custard.

2 Mix the arrowroot with a small quantity of water and blend to a smooth paste.

3 Place the sugar, ½ cup of water and a drop of pink food colouring in a small saucepan and bring to the boil.

4 Pour the hot mixture onto the blended arrowroot, stirring constantly.

5 Return the mixture to the saucepan and bring to the boil, stirring constantly until the mixture has thickened and is clear.

6 Carefully spoon or brush this mixture onto the top of the fruit flan, taking care to completely cover the fruit.

MAKES TWO 8-CENTIMETRE TARTLETS



Fruit tartlets

EVALUATION

1 Describe the sensory properties of the finished fruit tartlets using descriptive language.

2 What process causes the pastry to brown?

3 Read the labels on the packages of the cornflour and custard powder to determine the source of the starch. What other ingredients are present in custard powder?

4 Why is it necessary to blend the flours before adding the hot milk?

5 Why is the hot milk added to the blended mixture and not the other way around?

6 Explain what is likely to happen if the arrowroot is not blended before the hot sugar syrup is added to it.

7 Why is it important to stir starch mixtures constantly when gelatinisation is taking place?

8 Why is arrowroot a better choice than cornflour for the glaze?

9 Identify the two stages in which gelatinisation has occurred in this recipe.

10 Evaluate the nutritional properties of the fruit tartlets by plotting the ingredients on a diagram of the Australian Guide to Healthy Eating. Explain why pastry products should only be eaten occasionally and in small amounts.

Kangaroo chilli con carne with bush chips

Kangaroo is an animal that has long been used as a source of food for Indigenous communities. Kangaroo meat is a very nutritious food as it is high in protein, iron and zinc, and is low in saturated fat. This recipe uses a range of spices to enhance the flavour of the kangaroo mince to produce a tasty main course. The bush chips provide a contrasting crunchy texture and flavour.

Kangaroo chilli con carne

2 teaspoons oil

½ onion, finely diced

1 clove garlic, crushed

½ red capsicum, diced

2 teaspoons Mexican chilli powder

200 grams kangaroo mince

1 cup canned chopped tomatoes

1 tablespoon tomato paste

¼ cup of cold water

200 grams red kidney beans, drained and rinsed

METHOD

1. Heat oil in a large saucepan over medium heat. Add the onion and garlic and sauté until tender but not browned.
2. Add the capsicum and continue cooking for a further 2 minutes.
3. Add the Mexican chilli powder and cook for 1 minute to develop the flavour.
4. Crumble in the kangaroo mince, stirring with a wooden spoon to break up the mince. Cook only until the mince has lost its raw red colour.
5. Add the canned tomatoes, tomato paste and water. Bring to the boil. Reduce heat to low and allow to simmer, partially covered, for 20 minutes or until sauce has reduced slightly.
6. Add the kidney beans and cook for a further 10 minutes or until beans are heated through and the sauce has thickened.

   Serve with bush chips.

SERVES 2

Bush chips

macadamia oil or spray

2 small pita breads, cut open

ground bush flavourings such as aniseed myrtle, akudjura (ground bush tomato), lemon myrtle, native pepper

METHOD

1. Preheat oven to 180°C.
2. Spray one side of the bread lightly with macadamia oil or brush oil on with a pastry brush.
3. Sprinkle lightly with the selected ground flavouring. You could use one of the selected flavours per piece of pita bread.
4. Place on an oven tray and bake for approximately 5–10 minutes or until crisp and lightly browned.

SERVES 2

EVALUATION

1 Describe the sensory properties of both the kangaroo chilli con carne and bush chips and explain why they are served together.
2 Draw a flow chart to explain the process of dicing.
3 Describe how you determined when the oil was sufficiently hot to add the diced onion and garlic when cooking the kangaroo chilli con carne.
4 Why is it important to stir the kangaroo mince in step 4 of the recipe?
5 Describe some of the physical and chemical changes that occur in the meat during the simmering process.
6 Outline three safety considerations when cooking in the oven.
7 Suggest an alternative accompaniment to serve with the kangaroo chilli con carne if you did not wish to make the bush chips.
8 If you were to make this recipe again, what changes would you make to the ingredients or processes?
9 What are the health benefits of kangaroo meat compared with other red meat?
10 Evaluate the nutritional properties of the kangaroo chilli con carne with bush chips by plotting the ingredients on a diagram of the Australian Guide to Healthy Eating.



Kangaroo chilli con carne with bush chips

Chocolate and wattleseed self-saucing pudding

Wattleseed is an Australian native spice that gives a chocolate, coffee and hazelnut flavour and aroma to recipes. It is very versatile and can be used to flavour a wide variety of dishes such as biscuits and ice-cream, and desserts such as this simple chocolate pudding.

WATTLESEED PUDDING

2 tablespoons boiling water

1 tablespoon wattleseeds

½ cup self-raising flour

1 tablespoon cocoa

40 grams butter

¼ cup brown sugar

1 egg, slightly beaten

¼ cup milk

SAUCE

⅓ cup brown sugar

1 tablespoon cocoa

¾ cup boiling water

METHOD

1 Pour boiling water over the wattleseeds and soak for 10 minutes. Strain through a fine strainer. Retain the wattleseed grounds.
2 Preheat oven to 180°C. Grease two individual ovenproof ramekins.
3 Sift the flour and cocoa into a medium bowl.
4 Cream the butter and brown sugar until light and fluffy.
5 Add the egg gradually a tablespoon at a time and stir until well combined.
6 Stir in the sifted flour and cocoa mixture alternately with the milk. Gently stir through the retained wattleseed grounds.
7 Divide the pudding mixture evenly between two ovenproof ramekins.
8 To make the sauce, mix the brown sugar and cocoa. Sprinkle over the top of the puddings. Pour the boiling water gently over the top of the puddings.
9 Bake in the preheated oven for approximately 25 minutes until the puddings have risen and feel firm to touch.

SERVES 2

EVALUATION

1 Describe the sensory properties of the chocolate and wattleseed self-saucing pudding using descriptive language.
2 Explain why the wattleseeds are soaked for 10 minutes in step 1 of the recipe.
3 Why is it important to sift the flour and cocoa before using them in this recipe?
4 Outline the functional property of the flour in this recipe.
5 Explain how you can tell when the butter and sugar have been creamed sufficiently.
6 Predict what would happen if you were to add the egg all at once in step 5 rather than adding it gradually.
7 Why does the recipe recommend pouring the boiling water gently over the top of the pudding?
8 Explain two tips you would give a novice cook if they were to prepare this recipe for the first time.
9 Suggest an accompaniment that would be suitable to serve with the chocolate and wattleseed self-saucing pudding that would be in line with the principles of the Australian Guide to Healthy Eating.
10 Explain why it is recommended that desserts such as this are only eaten occasionally.



Chocolate and wattleseed self-saucing pudding

Macadamia shortbread

Macadamia nuts are one of the popular indigenous nuts used in cooking today. With the increased variety of sweet biscuits available on supermarket shelves these days, few families bother making biscuits at home. Complete the following production exercise and evaluate a variety of equipment and processing techniques that can be used to make shortbread biscuits.

Work in teams to complete this production exercise. Each student should prepare one quantity of the macadamia shortbread biscuits, using a different processing method.

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50 grams raw, unsalted macadamia nuts

1 cup plain flour

¼ cup rice flour

½ cup caster sugar

125 grams butter

1 teaspoon vanilla essence

METHOD

Preparing the nuts

1. Preheat oven to 200°C.
2. Chop the macadamia nuts roughly.
3. Line a baking tray with baking paper and bake in the preheated oven for 3–4 minutes, or until just lightly browned. Remove from the oven.
4. Reduce the oven temperature to 160°C.
5. Sift the flours together.
6. Combine the ingredients according to one of the following methods.
7. Turn the dough onto a lightly floured bench and knead gently until smooth.
8. Roll out to a thickness of 1 centimetre. Trim the edges and cut into fingers approximately 2.5 centimetres by 8 centimetres in size.
9. Bake in the preheated oven for approximately 15–18 minutes, or until just beginning to brown.
10. Cool on the oven tray.

MAKES ABOUT 12 BISCUITS



Macadamia shortbread biscuits

METHOD A

1. Add the sugar to the sifted flours. Rub in the butter with the fingertips.
2. Add the toasted chopped macadamia nuts and vanilla essence and work into a stiff dough.

METHOD B

1. Cream the butter and sugar with a wooden spoon until light and fluffy. Add the vanilla essence.
2. Add the toasted, chopped macadamia nuts and stir through half the flours until well combined. Add the remaining flour to form a stiff dough.

METHOD C

1. Cream the butter and sugar with an electric hand-held beater until light and fluffy. Add the vanilla essence.
2. Add the toasted, chopped macadamia nuts and stir through half the flour until well combined. Add the remaining flour to form a stiff dough.

METHOD D

1. Cream the butter and sugar in a food processor until light and fluffy. Add the vanilla essence.
2. Add the flour and mix for 1–2 minutes until combined. Add the toasted, chopped macadamia nuts and mix through.

Activity

Recording observations

When the biscuits have been produced, develop a series of testing techniques to evaluate the physical and sensory properties of each product. You could compare:

- colour
- shape after cooking
- texture and flavour
- aesthetic appeal.

Results

Record your results on a table like the one below.

	COLOUR	AESTHETIC APPEAL	SHAPE AFTER COOKING	TEXTURE AND FLAVOUR
A				
B				
C				
D				
Commercial biscuits				

EVALUATION

1 Explain why the macadamia nuts are only lightly browned before adding to the shortbread mixture.

2 What is the functional role of rice flour in this recipe?

3 Was there any noticeable variation in the colour and texture between the dough made by each method? Discuss.

4 Which dough was easiest to shape into fingers? Explain the results.

5 After baking, which biscuit had the most pleasing aesthetic appeal? Explain.

6 Which food-processing technique gave the best results? Explain your answer.

7 Which piece of equipment was the most convenient to use? Consider time, ease of use and cleaning when justifying your answer.

8 Purchase a similar commercial biscuit and evaluate the same physical and sensory properties of the commercial product that you evaluated in the homemade biscuits.

9 How did each of the homemade biscuits compare with the commercial product in terms of their physical and sensory properties?

10 Discuss why families would make biscuits at home instead of buying commercially made biscuits.

Lemon myrtle biscuits

Lemon myrtle has an intense citrus flavor – a combination of lemon and lime – and a slight lemongrass aroma. Like other indigenous flavouring ingredients, it is best to use lemon myrtle sparingly as it has a concentrated flavour. This biscuit dough can be successfully prepared and frozen and baked at a later date, or refrigerated overnight and baked the next day.

PASTRY

90 grams unsalted butter

⅓ cup caster sugar

2 egg yolks

1½ teaspoons ground lemon myrtle

¾ cup plain flour

⅓ cup self-raising flour

LEMON MACAROON FILLING

1 egg white

¼ cup icing sugar, sifted

½ cup desiccated coconut

3 tablespoons plain flour

zest of 1 lemon

METHOD

Making the biscuit pastry

1 Cream butter and sugar until light and fluffy.
2 Add the egg yolks to the butter mixture one at a time, beating well after each addition. Add the lemon myrtle.
3 Sift the flours together, stir into the mixture and form into a ball.
4 Wrap the biscuit dough in cling wrap and refrigerate for 20 minutes.

Making the lemon macaroon filling

1 Beat the egg white until stiff peaks form.
2 Gradually beat in the icing sugar.
3 Carefully fold in coconut, plain flour and lemon zest with a metal spoon.
4 Set aside to use as the filling for the lemon myrtle biscuits.

Filling and baking the biscuits

1 Preheat oven to 160°C. Line two baking trays with baking paper.
2 Roll out the biscuit pastry until it is 5 millimetres thick.
3 Cut the biscuits using a 7-centimetre cutter. Use a small circular petit four cutter to cut circles out of the centre of the biscuits.
4 Place the biscuits on the lined baking trays, allowing a little room for the biscuits to spread.
5 Bake the biscuits for 7 minutes.
6 Remove from the oven and fill the centre of each biscuit with a teaspoon of the lemon macaroon filling.
7 Return to the oven and bake for a further 12 minutes or until the biscuits are light brown in colour.
8 Lift the biscuits and allow to cool on the tray.
9 Store in an airtight container.

MAKES ABOUT 12 BISCUITS

EVALUATION

1 Describe the sensory properties of the lemon myrtle biscuits using descriptive language.
2 Explain why the accurate measurement of ingredients is important when making biscuits.
3 What is the purpose of creaming the butter and sugar together in the biscuit mixture?
4 Identify the different tools and equipment that could be used to cream the butter and sugar. Discuss the benefit of each when making biscuits.
5 Why is it important to add the egg yolks gradually to the creamed butter and sugar?
6 Suggest another indigenous flavouring that could be used in the biscuit recipe.
7 When grating the rind of a lemon for the macaroon filling, how do you ensure only the lemon flavour is collected and there is no bitter aftertaste?
8 Why are the biscuits lifted and left to cool on the tray?
9 Discuss two safe work practices you followed during the production of the biscuits.
10 If you were to repeat the lemon myrtle biscuits in the future, what modifications would you make?



Lemon myrtle biscuits

Vegetable fritters with yoghurt sauce

A variety of vegetables are used in this tasty snack. Preparation processes include peeling, grating, chopping and mixing. This is an ideal recipe for children to help with peeling, grating, chopping and mixing the ingredients. The yoghurt sauce adds a tangy flavour to the fritters. The mixture is quite moist so it is not suitable for large-sized fritters.

VEGETABLE FRITTERS

½ cup grated zucchini
1 cup grated carrot
¾ cup corn kernels, fresh, canned or frozen
2 spring onions, finely sliced
1 tablespoon parsley, finely chopped
1 tablespoon mint, finely chopped
½ cup self-raising flour
½ cup plain flour
½ teaspoon curry powder
a pinch of salt
1 egg
½ cup coconut milk
4 tablespoons oil for frying

YOGHURT SAUCE

½ cup Greek-style yoghurt
½ lemon, juiced
1 clove garlic, crushed
salt and pepper

METHOD

Making the vegetable fritters

1 Place the grated zucchini in a sieve with a pinch of salt and leave to stand while you prepare the remaining ingredients.
2 Prepare the vegetables and herbs and combine in a large bowl.
3 Squeeze out the excess moisture from the zucchini then add to other vegetables.
4 Sift in the dry ingredients – the flours, curry powder and salt.
5 Add the egg and coconut milk to the bowl and stir until combined.
6 Heat two tablespoons of oil in a frying pan and fry off small portions of the mixture. Use a ¼ measuring cup or a metal tablespoon to measure out the batter so the fritters are of equal size.
7 Cook the fritters for 5 minutes on each side or until golden brown. Add the remaining oil into the frying pan as needed.
8 Drain the cooked fritters on paper towel before serving.

Making the yoghurt sauce

1 Mix the yoghurt, lemon juice and crushed garlic together. Season with salt and pepper to taste. Cover and refrigerate until required.

MAKES 12–15 FRITTERS

EVALUATION

1 Describe the sensory properties of the vegetable fritters with yoghurt sauce using descriptive language.
2 Which section of the grater did you use to prepare the zucchini and carrot? Explain why it was the most appropriate size to use?
3 Describe the process to use when crushing garlic with a knife. Which knife is most appropriate to use for this task?
4 What is the best tool for mixing the fritter batter? Explain why.
5 Why is it necessary to salt the grated zucchini and rest it in a sieve?
6 Describe how you tested the oil to determine when it was hot and ready for frying.
7 What indicators did you look for before turning the fritters over?
8 How does draining the fritters on paper towel improve the sensory properties of the vegetable fritters?
9 Evaluate the nutritional properties of the vegetable fritters with yoghurt sauce by plotting the ingredients on a diagram of the Australian Guide to Healthy Eating.
10 Explain how you would alter this recipe to make it suitable for someone with coeliac disease? Justify your answer.



Vegetable fritters with yoghurt sauce

Apricot and almond tartlets

Apricots were one of the first stone fruit trees planted as part of Australia's developing horticultural production and became a popular canned fruit. When preparing these delicate pastries, accurate measurement of the ingredients is essential to ensure the success of the product. Inaccurate measurement often makes it difficult to combine ingredients, especially when making the pastry, and will have a negative effect on the sensory properties of the finished product.

PASTRY

¼ cup plain flour

¼ cup self-raising flour

2 tablespoons icing sugar

75 grams chilled butter, cubed

1 egg yolk

1–2 tablespoons iced water

FILLING

60 grams butter

¼ cup caster sugar

1 egg

2 teaspoons plain flour, sifted

½ cup ground almonds

4 drained canned apricot halves

2 tablespoons apricot jam, warmed and sifted

Note: the ½ cup of ground almonds used in the filling can be substituted with ⅓ cup of finely ground polenta to make this recipe suitable for people who are allergic to nuts.

METHOD

1. Combine the flours, icing sugar and butter in a food processor and process until the mixture resembles fine breadcrumbs.
2. Add the egg yolk and iced water and, using the pulse button, process until the mixture starts to come together.
3. Transfer to a bowl and bring the pastry together with your hands. Do not knead. Shape into a disc, wrap with cling wrap and refrigerate for 20 minutes.
4. Roll out the pastry on a lightly floured surface to a thickness of 3 millimetres. Using a 7.5-centimetre fluted cutter, cut out 9–12 rounds.
5. Press each round into the greased tartlet tray and chill for 10 minutes.
6. Preheat oven to 180°C and prepare the filling.
7. Cream the butter and sugar until light and fluffy.
8. Gradually add the egg and beat well.
9. Fold in the flour and ground almonds.
10. Spoon the filling mixture into each tartlet case. Only half-fill each tartlet with filling.
11. Slice the apricots to equal the number of tartlets made and place a slice on top of each. Bake in a moderate oven at 180°C for 15–20 minutes until golden brown.
12. Remove from the oven and brush the top of each tartlet with the apricot jam. Take care not to brush the edges of the pastry.
13. When cool, remove carefully from the tray and serve.

MAKES 9–12 TARTLETS

EVALUATION

1 Describe the sensory properties of the apricot and almond tartlets using descriptive language.
2 Explain how you would accurately measure the flours and icing sugar.
3 What effect would inaccurate measuring of the water have on the texture of the pastry?
4 Explain why a sweet shortcrust pastry is not kneaded.
5 Why is it important to rest and chill the pastry before rolling out and after lining the tartlet tins?
6 How can you tell if the butter and sugar have been creamed sufficiently? Why is this important?
7 Identify and explain the two chemical changes that occur in the pastry when it is baked.
8 Suggest other fruits that could be used for the filling.
9 Explain one safety rule to observe when cleaning the food processor.
10 Evaluate the nutritional properties of the apricot and almond tartlets by plotting the ingredients on a diagram of the Australian Guide to Healthy Eating. Explain why pastry products should only be eaten occasionally and in small amounts.



Apricot and almond tartlets

Mini orange syrup cakes

Citrus fruits such as oranges, lemons and limes have been an important part of Australian horticulture since these fruits arrived on the First Fleet in 1788. They have since become a key crop grown in the Murray Valley in Victoria. Oranges are used in this recipe to provide flavour and moisture to the cake. Boiling and baking are the cooking techniques used in this recipe.

60 grams butter

⅓ cup caster sugar

1 egg, lightly beaten

¾ cup self-raising flour, sifted

¼ cup milk

½ teaspoon vanilla essence

ORANGE SYRUP

1 orange, zest and juice

¼ cup castor sugar

METHOD

Making the cakes

1 Preheat oven to 180°C.
2 Line a muffin tin with patty cake papers (large muffin size), as this is a very tender cake.
3 Cream the butter and sugar with a wooden spoon until pale and fluffy.
4 Add the egg gradually and beat well.
5 Add half the sifted self-raising flour, and then half the milk. Mix well.
6 Repeat with the remaining flour and milk. Add vanilla and mix well.
7 Spoon the mixture into the patty cake papers.
8 Bake for 10–15 minutes or until a skewer comes out clean after being inserted into the centre of a cake. The cakes will still be quite pale.

Making the orange syrup

1 Remove the zest of the orange and julienne very finely, then juice the orange.
2 Combine all the ingredients in a small saucepan.
3 Stir constantly over a low heat until the sugar is dissolved.
4 Bring to the boil and simmer gently for 2 minutes, without stirring, until the syrup has reduced a little.

Assembling the cakes

1 Place the cakes on a wire rack to cool. Place the rack over a plate. Prick the cakes 4 or 5 times with a fine skewer.
2 Spoon the hot syrup over the cooked cakes and top with strips of orange zest. Spoon any syrup that drips onto the plate over the cakes.
3 Stand for 15 minutes before serving. Serve with cream or ice-cream.

MAKES 4–5 CAKES

EVALUATION

1 Describe the sensory properties of the mini orange syrup cakes using descriptive language.
2 Identify one piece of equipment you could use to zest the orange and explain how you would use it safely.
3 What is the functional property of egg in this recipe?
4 Describe the physical changes in the mixture when the butter and sugar are creamed together.
5 Why is the flour sifted before it is added to the cake mixture?
6 Predict the impact on the cake batter if the flour and milk were added all at once rather than gradually.
7 How could you tell if the cakes are cooked, other than by testing with a skewer?
8 What safety precautions are necessary when using the oven to cook the mini orange syrup cakes?
9 Explain the difference between boiling and simmering when making the syrup.
10 Why is it important to allow the cakes to stand after the syrup has been poured over them?



Mini orange syrup cakes

Pork and soba noodle stir-fry

Stir-frying is a cooking technique that was introduced into Australia by the Chinese during the gold rush; the technique was also popular with the Vietnamese migrants who arrived during the 1970s. It is considered to be a healthy form of cooking because it uses little fat and the food is tossed quickly over the heat so it retains most of its nutrients. It is now a popular cooking method with a wide range of families. This recipe uses a very low-fat cut of pork and a wide variety of vegetables that will provide many important micronutrients as well as dietary fibre.

MARINADE

1 tablespoon honey

2 teaspoons soy sauce

1 tablespoon kecap manis

½–1 teaspoon sambal oelek

STIR-FRY

150 grams pork scotch fillet, thinly sliced

½ onion, cut into wedges

½ carrot, julienned

¼ red capsicum, julienned

6 snow peas

2 tablespoons oil, for frying

2 centimetres ginger, finely sliced

1 clove garlic, finely crushed

¼ cup water or stock

2 spring onions, sliced into 4-centimetre lengths

1 portion, soba noodles

¼ cup coriander, finely chopped

METHOD

1. Combine the honey, soy sauce, kecap manis and sambal oelek, add the slices pork scotch fillet, and marinate in the refrigerator 15–20 minutes.
2. Cut all the vegetables into the appropriate sizes, as listed.
3. Bring a medium-sized saucepan of water to the boil. When the water is boiling, add the soba noodles and cook for 4 minutes. Drain and rinse in warm water, drain again.
4. Drain marinade from pork scotch fillet and heat 1 tablespoon of oil in the wok on high.
5. Fry onion for 30 seconds then add half the meat strips. Cook for 1 minute then add the remainder of the meat. Stir-fry until almost cooked. Remove from heat and keep warm.
6. Wipe out the wok with paper towel and heat the remaining oil on high.
7. Add the ginger and garlic, then the carrot, capsicum and snow peas, allowing 30 seconds between the addition of each ingredient.
8. Add the water or stock and cook until vegetables are just tender.
9. Add the spring onions. And cook for 30 seconds.
10. Return the meat and onion to the wok then stir through noodles. Serve and sprinkle with coriander.

SERVES 2

EVALUATION

1 Describe the sensory properties of the pork and soba noodle stir-fry using descriptive language.
2 Explain the steps you took to julienne the carrot and capsicum.
3 Why is it important to rinse the noodles after they have been cooked?
4 Predict the outcome if you forgot to drain the marinated pork before adding it to the wok.
5 Describe the changes to the physical and chemical properties of the pork after it was stir-fried.
6 Why does the recipe recommend allowing 30 seconds between adding each of the vegetables to the wok in step 7 of the recipe?
7 Why is stir-frying considered to be a dry method of cooking?
8 Describe the safe work practices you followed when:
   - preparing the onion, carrot and capsicum
   - cooking the pork in the wok
   - boiling the noodles.
9 Evaluate the nutritional properties of the pork and soba noodle stir-fry by plotting the ingredients on a diagram of the Australian Guide to Healthy Eating.
10 Explain why stir-frying is a popular method of cooking in Australian homes today.



Pork and soba noodle stir-fry

Semolina gnocchi with roasted tomato sauce

Gnocchi is a classic traditional Italian recipe. In this recipe semolina replaces the traditional potato as the main starch ingredient. The semolina produces a slightly firmer texture in the gnocchi and a golden-brown crust during baking. Roma tomatoes have a low moisture content. Roasting the tomatoes before making the sauce concentrates the flavour and produces a much richer colour.

This dish can also be served as an alternative to mashed potato as an accompaniment to a meat dish.

ROASTED TOMATO SAUCE

3 ripe Roma tomatoes

1 tablespoon olive oil

a pinch of dried basil or oregano

1 clove garlic, finely chopped

salt and pepper

SEMOLINA GNOCCHI

1⅓ cups milk

⅓ cup semolina

salt

⅓ cup parmesan cheese

1 egg yolk

10 grams butter

METHOD

Making the tomato sauce

1. Preheat oven to 200°C.
2. Cut the tomatoes in half lengthwise and place them on a baking dish in a single layer, cut side up.
3. Drizzle the tomatoes with olive oil. Sprinkle with dried herbs, garlic and salt and pepper.
4. Bake at 200°C for 20 minutes. Remove from the oven and set aside.
5. When cool, slip the skins off the tomatoes. Purée with the garlic, and season with salt and pepper. Thin this mixture with a little hot water if necessary.
6. Serve with the baked gnocchi.

Making the gnocchi

1. Pour the milk into a saucepan and bring almost to the boil. Lower the heat and add the semolina in a slow trickle, stirring constantly with a wooden spoon.
2. Cook for 8–10 minutes over low heat, stirring constantly until it is thick and creamy.
3. Remove from the heat and add a pinch of salt and half the parmesan cheese.
4. Beat in the egg yolk and half the butter.
5. Moisten a tray with a little water and spread out the cooked semolina about 1 centimetre thick, using a wet spatula. Refrigerate to cool.
6. Cut the cooled semolina into rounds with a 5-centimetre cutter, dipped in water to stop it from sticking.
7. Place the rounds of semolina in a greased ovenproof container approximately 15 × 20 centimetres in size, in a single layer, overlapping slightly. Fill in the gaps with the off-cuts.
8. Increase the oven temperature to 220°C.
9. Dot the rounds of semolina with the remaining butter and sprinkle with the remaining parmesan cheese.
10. Bake the gnocchi for 10–15 minutes or until it forms a crisp, golden crust.

SERVES 2

EVALUATION

1 Describe the sensory properties of the semolina gnocchi with roasted tomato sauce using descriptive language.

2 Describe the physical properties of the uncooked semolina. How do these change during the cooking process?

3 Why is it important to add the semolina in a small trickle when adding it to the hot milk?

4 Explain why it is necessary to stir the mixture constantly as the semolina is added.

5 What process relating to starches causes the semolina to thicken the milk?

6 How does the process of roasting change the sensory properties of the tomatoes?

7 Describe another way of shaping the gnocchi.

8 What other variations of the sauce could be served with the gnocchi?

9 Discuss your performance in terms of:

- cooking the semolina
- cutting the gnocchi
- making the tomato sauce
- serving and plating the semolina gnocchi with roasted tomato sauce.

10 Explain why the semolina gnocchi with roasted tomato sauce would be a healthy meal for vegetarians. Justify your answer by referring to the Australian Guide to Healthy Eating.



Semolina gnocchi with roasted tomato sauce

Feta, broccoli and carrot pie

Feta cheese (also often spelled 'fetta') and filo pastry are both traditional ingredients used in Greek cuisine. Greek migrants brought these and other traditional Greek ingredients to Australia following World War II. Feta cheese and filo pastry are key to many traditional Greek dishes including *spanakopita* – a spinach, feta and filo pie. Although meat is not used, the recipe for feta, broccoli and carrot pie uses a range of ingredients to provide an adequate source of protein. The feta cheese and eggs are both good sources of complete protein, while the filo pastry and pine nuts contain several incomplete proteins, which complement each other to produce an additional source of complete protein.

250 grams broccoli

½ carrot

2 spring onions

125 grams firm feta

½ cup fresh breadcrumbs

2 teaspoons olive oil

2 tablespoons pine nuts

2 eggs, beaten

black pepper

4 sheets filo pastry

1 tablespoon olive oil

METHOD

1. Preheat oven to 200°C.
2. Cut the broccoli into small florets. Steam or microwave the broccoli for 2–3 minutes until just tender. Do not overcook.
3. Grate the carrot and finely chop the spring onions.
4. Grate the feta.
5. Sauté the pine nuts in the olive oil in a frying pan for 3–4 minutes until golden brown. Remove from the frying pan and drain on paper towel.
6. Add the spring onion to the frying pan and cook for 1 minute. Add the grated carrot and cook for a further 2–3 minutes until wilted. Cool slightly.
7. Combine the broccoli, spring onions, carrot, pine nuts, beaten eggs, breadcrumbs, grated feta and pepper in a bowl. Mix well.
8. Brush 1 sheet of filo with the olive oil. Place another sheet crossways on top. Brush with oil. Repeat the layering of the pastry with 2 more sheets of filo.
9. Lift the pastry into a 20-centimetre foil container or a 20-centimetre round or square cake tin. Spoon the feta and broccoli filling on top of the pastry. Fold the extra pastry in over the top to form a lid. Brush with oil.
10. Bake the pie at 200°C for 10 minutes. Reduce the heat to 180°C and continue to cook for a further 20–30 minutes or until the mixture has set and is cooked through.

SERVES 2–3

EVALUATION

1 Describe the sensory properties of the feta, broccoli and carrot pie using descriptive language.
2 Explain the function of the eggs in this recipe.
3 Why are the pine nuts only cooked for 3–4 minutes?
4 What other type of pastry would be suitable for preparing this dish? Justify your recommendation.
5 Feta cheese is high in salt. What other type of cheese would be suitable for using in this recipe to reduce the salt content?
6 Discuss the effect of heat on the physical properties of the pastry.
7 Explain how the heat is transferred in the oven when the pie is baked.
8 Describe two safety rules to observe when using the oven.
9 Explain why filo pastry is considered to be a healthier option than the types of pastry used for meat pies and sausage rolls.
10 Plot the ingredients for the feta, broccoli and carrot pie on a diagram of the Australian Guide to Healthy Eating. Does the pie meet the guidelines of this food selection model? Explain.



Feta, broccoli and carrot pie

Focaccia

Focaccia is an Italian, thick pizza-like bread that is flavoured with a variety of toppings such as herbs, spices, salt crystals and parmesan cheese. The cooked focaccia is served to accompany soup or as a snack, split and filled with ingredients such as ham, cheese, and tomato. It is sometimes toasted or cooked in a sandwich press.

2 cups bread flour
1 teaspoon salt
2 teaspoons dried yeast
1 teaspoon oil
1 cup warm to hot water (not boiling)
1–2 teaspoons olive oil

TOPPING OPTIONS

1 tablespoon of mixed fresh herbs, for example basil or parsley
2 tablespoons parmesan cheese
2 cloves crushed garlic
2 tablespoons chopped olives
sprinkle of lemon pepper



Focaccia

METHOD

1. Preheat oven to 220°C.
2. Lightly grease a baking tray.
3. Sift the flour, salt and yeast into a bowl.
4. Make a well in the centre of the dry ingredients and add oil and almost all the water. Mix to a soft dough, adding the rest of the water if necessary.
5. Turn onto a floured surface and knead for 5 minutes.
6. Divide the dough in half and roll and shape each into an oval 2 centimetres thick.
7. Place on a baking tray and cover each oval loosely with a piece of plastic food wrap and prove in a warm place until it doubles in size.
8. Make indents in the top every 3–4 centimetres by pushing down firmly with your fingertips. Brush each oval with olive oil and sprinkle with one of the selected toppings.
9. Bake for 15 minutes at 220°C, then reduce the oven temperature to 200°C and bake for a further 5 minutes.
10. Place on a rack to cool.

SERVES 2

EVALUATION

1. Describe the sensory properties of the focaccia using descriptive language.
2. Why is it important to use bread flour when making this recipe?
3. Suggest reasons why the dry ingredients are sifted.
4. Explain the purpose of adding oil to this mixture.
5. Describe the ideal conditions for the growth of yeast.
6. Why is it important not to use boiling water to mix the dough?
7. What impact does kneading have on the dough?
8. Explain what happens when the risen dough is placed in the hot oven.
9. What processes are responsible for the browning of the cooked focaccia?
10. Explain why bread is usually served as an accompaniment to an Italian meal.

Pita bread

The pita bread can be baked in the oven or fried on the cooktop. Pita cooked in the oven puffs up and makes a larger pocket. They stay pale in colour and have a mild flavour. The pita cooked on the cooktop doesn't usually puff very much, but it develops a more golden colour and a crunchier texture.

1½ cups bread flour

1 teaspoon salt

1 teaspoon dried yeast

½ cup warm water

2 teaspoon honey

2 teaspoons extra virgin olive oil

flour for dusting

semolina for dusting

METHOD

1 Sift 1½ cups of the flour, salt and yeast into a large bowl.

2 Combine the water, honey and olive oil in a jug and mix together. Pour two-thirds of the liquid into the flour and stir until a shaggy dough is formed. Use the remaining liquid to adjust the dough until all the dry ingredients are collected into the dough. Form the dough into a ball in the bowl.

3 Cover the bowl with oiled cling wrap and sit in a warm place for the dough to prove and double in size.

4 Sprinkle the flour for dusting on the bench and turn out the dough. Knead until the dough is smooth and springs back when gently pressed with your finger.

5 Divide the dough into 4 equal portions and knead into individual balls.

6 Dust the bench with semolina and roll out the balls until they are 5 millimetres thick. Dust a baking tray with semolina and place the discs on the tray in a single layer. Prove on the bench for 10–20 minutes until slightly risen before cooking.

Oven-baking the pita

1 Preheat oven to 230°C. Place the pita in single layer on a baking tray. Position the baking tray in the middle of the oven and bake for 3 minutes.

2 Remove the tray from the oven and flip the pitas. Return to the oven and bake for 1–2 minutes or until the pita have puffed up like a balloon.

3 Remove from the oven and cover with a clean tea towel until cool.

Pan-frying the pita

1 Heat a frying pan over medium heat. Lightly spray with oil or drizzle in a little oil then wipe out the frying pan. Prick the pita with a fork then cook for 2 minutes on each side or until golden brown.

2 Cover with a clean tea towel until cool.

MAKES 4 PITA BREAD

EVALUATION

1 Describe the sensory properties of the pita bread using descriptive language.

2 Explain why this recipe recommends using bread flour to make the pita.

3 List three conditions yeast needs to grow.

4 Explain the functional role of honey in this recipe.

5 How does kneading affect the development of the dough?

6 Explain why the pita bread puffs up when baked in the oven.

7 Identify and describe the way heat is transferred to cook the pita bread in the frying pan.

8 Name the process that causes the pita bread to brown when baked.

9 Explain why pita cooked in a frying pan on the cooktop would have a crunchier texture than pita cooked in the oven.

10 Filled pita bread is a popular school lunch item with both primary and secondary students. Explain why.

Grissini

These thin crunchy bread sticks are an ideal accompaniment to soups, salads, dips, and antipasto and to serve with a cheese board. The sticks add an interesting, contrasting texture when eaten with smooth, soft foods.

The flavour can be varied. Try replacing the parmesan cheese, garlic and basil with two finely chopped dried pears and 2 tbs finely chopped pistachio nuts.

1 teaspoon dried yeast
1 teaspoon sugar
1 cup warm water
2 cups bread flour
½ teaspoon salt
1 tablespoon olive oil
¼ cup finely grated parmesan cheese
1 clove garlic, crushed
1 tablespoon fresh basil, finely chopped
1 tablespoon parmesan cheese, extra
2 dried pears, finely chopped
2 tablespoons pistachio nuts, finely chopped

METHOD

1. Combine the yeast, sugar and water in a bowl and leave in a warm place for 5–10 minutes until frothy.
2. Sift the flour and salt then stir in the yeast mixture and oil until well combined. Add more warm water if the mixture is too dry.
3. Form the dough into a ball, turn onto a lightly floured surface and knead until soft and elastic.
4. Divide the dough into two portions. Add the parmesan cheese, garlic and basil to one, and the pears and pistachios to the other. Knead these ingredients into each dough portion.
5. Place each dough portion into a lightly oiled bowl and cover with cling wrap.
6. Leave in a warm place until the dough has doubled in size. Preheat oven to 220°C and lightly grease two large baking trays.
7. Roll each dough portion into a rectangle 20 × 30 centimetres and cut into 1-centimetre strips.
8. Roll each strip into a long stick and place each stick 2 centimetres apart on the baking tray.
9. Brush with water and sprinkle the strips with the extra parmesan cheese.
10. Bake for 15 minutes until crisp and golden brown.

MAKES ABOUT 20 GRISSINI

EVALUATION

1. Describe the sensory properties of the grissini using descriptive language.
2. What causes the yeast, water and sugar mixture to froth?
3. Why is the mixture kneaded?
4. What component of flour enables the dough to become elastic?
5. Why is the dough rested in a warm place to double in size?
6. Identify the process that occurs during baking that creates a golden brown colour on the grissini sticks.
7. Design and sketch another way of shaping the sticks.
8. Suggest some alternative ingredients that could be used to flavour the grissini.
9. Identify two safe work practices you followed during production.
10. Plot the ingredients for the grissini on a diagram of the Australian Guide to Healthy Eating and comment on their nutritional value as a snack food.



Grissini

Carrot dip and white bean dip

Dips such as this carrot dip and white bean dip are similar to those served as part of a Greek *mezze* platter. Both the chickpeas used in the carrot dip and the cannellini beans that are the basis of the white bean dip are high in dietary fibre and protein and are low in saturated fat. These beans also have a low glycaemic index, making them an ideal food to eat as a snack. The olive oil used in white bean dip is a monounsaturated or 'heart-friendly' fat. Both of these dips are delicious spread over homemade pita bread or as an accompaniment to grissini.

Carrot dip

400 gram canned chickpeas

½ teaspoon ground cumin

½ teaspoon ground coriander

½ teaspoon curry powder

2 carrots

2 tablespoons tahini paste

½ orange, zest and juice

salt

METHOD

1. Drain the chickpeas and set aside.
2. Combine the ground cumin, coriander and curry powder in a bowl. Peel the carrots and cut into 1.5-centimetre pieces and toss through the spice mix.
3. Set up a steamer and steam the spice-coated carrots for 15–20 minutes until the carrots are tender.
4. Place the chickpeas, cooked carrots, tahini paste and zest and juice of the orange into a food processor and whizz until a smooth paste is formed.
5. Season with salt to taste.

White bean dip

200 grams canned white cannellini beans, drained and rinsed

½ lemon, juiced

1 clove garlic, crushed

1½ tablespoon olive oil

METHOD

Place all the ingredients in a food processor and whiz until a smooth purée is formed.



Carrot dip and white bean dip

EVALUATION

1 Describe the sensory properties of the carrot dip and white bean dip using descriptive language.
2 Draw a simple flow chart to demonstrate how to crush the garlic using a cook's knife and chopping board.
3 Explain how to store spices to retain their sensory properties.
4 Outline three important rules for using a steamer safely.
5 Identify an alternative method of cooking the carrots if you did not have a steamer.
6 Explain three safety rules for using an electric food processor.
7 Identify two flavouring ingredients you could add to the white bean dip if you wanted to give it a spicy flavor.
8 If you were to make these recipes again, what modifications would you make to the ingredients or processes? Explain your answer.
9 Discuss your success in the preparation of these recipes. Focus on your knife skills, cooking and processing the ingredients to the right degree of doneness and the final presentation of the dips.
10 Plot the ingredients for the carrot dip and white bean dip on a diagram of the Australian Guide to Healthy Eating and comment on their nutritional value as a snack food when served with pita bread or grissini sticks.

Nutty sweet potato soup

Soups such as this nutty sweet potato soup demonstrate the way contemporary Australian cuisine is a fusion of classic ingredients such as sweet potato, with Asian flavours, including curry, coriander and coconut cream. Two varieties of nuts are used in this soup to enhance the flavour, texture and nutrient value of the soup. Sautéing and boiling are the two cooking techniques used in this recipe.

1 tablespoon vegetable oil

2 teaspoons curry powder

1 tablespoon coriander roots and stems, finely chopped

1 onion, peeled and diced

500 grams sweet potato, peeled and cut into 1-centimetre cubes

500 millilitres vegetable stock or water

50 millilitres coconut cream

50 grams unsalted roasted cashews, chopped

coriander leaves for garnish

METHOD

1. In a medium saucepan, heat the oil and add the curry powder and coriander stems and roots. After 30 seconds, add the onion and sauté until soft.
2. Add the sweet potato and stir through the spice mixture until coated.
3. Add the water or stock and bring to the boil. Cover and simmer the soup for 20–30 minutes or until the sweet potatoes are falling apart.
4. Remove from the heat, add the coconut cream and the cashews. Blend the mixture until smooth. Reheat gently. Do not boil.
5. Garnish with coriander leaves and serve.

SERVES 2–3

EVALUATION

1. Describe the sensory properties of the nutty sweet potato soup using descriptive language.
2. Why are the curry powder and the coriander stems heated in the oil for 30 seconds before the other ingredients are added?
3. Explain why it is important to sauté the onion in step 1 of the recipe.
4. Explain the difference between the two moist methods of cooking: boiling and simmering.
5. Why is it important to cook the sweet potatoes until they are disintegrating?
6. What problem could occur with the soup if it were boiled after the coconut cream and nuts were added?
7. Suggest alternative ingredients to create a new soup.

CURRENT INGREDIENT	ALTERNATIVE INGREDIENT
Sweet potato	
Curry powder	
Coconut cream	
Cashew nuts	

8. What tools and equipment could be used to blend the soup into a smooth mixture?
9. If you were to repeat this recipe, what modifications could you make?
10. Evaluate the nutritional properties of the nutty sweet potato soup by plotting the ingredients on a diagram of the Australian Guide to Healthy Eating.



Nutty sweet potato soup

Soba noodle salad

Many recipes described as contemporary Australian cuisine borrow heavily from Asian cultures including Japanese. This recipe for a soba noodle salad is based on traditional Japanese ingredients. Soba noodles are a Japanese noodle made from buckwheat and wheat flour, which gives them a brownish-grey colour. After cooking, they are rinsed to remove excess starch to keep the noodles separate and to allow them to absorb the flavours of the dressing. A number of cooking techniques – frying, blanching and boiling – are used in this recipe to maximise the sensory properties of all the ingredients.

2 teaspoons sesame seeds

½ chicken fillet

1 tablespoon soy sauce

½ teaspoon sesame oil

1 egg

3 teaspoons vegetable oil

4 snow peas

⅙ red capsicum

½ Lebanese cucumber

70 grams buckwheat soba noodles

¼ cup coriander leaves, washed

DRESSING

1 teaspoon pickled ginger

1 tablespoon mirin

1 tablespoon rice wine vinegar

½ teaspoon sesame oil

METHOD

1. Dry-fry the sesame seeds in a frying pan until pale golden. Set aside.
2. Pull the chicken tenderloin out to the side then place the chicken fillet inside two sheets of baking paper and use a meat mallet or rolling pin to flatten slightly.
3. Prepare a marinade of soy sauce and sesame oil in a shallow bowl. Add the chicken to the marinade and allow to stand for 20 minutes.
4. Whisk the egg until the yolk and white are well combined. Heat 1 teaspoon of the vegetable oil in a small non-stick frying pan. Add the egg and cook over a low heat until the egg is set. Place omelette on paper towel to remove any excess oil.
5. When cool, cut the omelette into fine strips and set aside to use as a garnish.
6. Blanch the snow peas in boiling water for 30 seconds. Drain and refresh. Cut into fine julienne shreds.
7. Cut the red capsicum into fine julienne shreds.
8. Cut the Lebanese cucumber in half lengthwise and use a teaspoon to scoop out the seeds. Cut across into very fine slices.
9. Remove the chicken from the marinade and pat dry with paper towel. Heat the remaining 2 teaspoons of oil in a small frying pan and cook the chicken for approximately 3 minutes on each side or until cooked through. Remove from heat and rest.
10. Bring a medium-sized saucepan of water to boil. When the water is boiling, add the soba noodles and cook for 4 minutes. Drain and rinse in warm water. Drain again.
11. To prepare the dressing, rinse the pickled ginger in cold water and then chop finely. Add the mirin, rice wine vinegar and sesame oil.
12. Slice the chicken thinly and combine with the snow peas, red capsicum and Lebanese cucumber in a bowl. Add the dressing.
13. Add the drained soba noodles and coriander leaves and toss gently to combine. Place in a serving bowl or plate.
14. Garnish with the omelette strips and toasted sesame seeds.

SERVES 1

EVALUATION

1 Describe the sensory properties of the soba noodle salad using descriptive language.

2 Identify the cooking techniques used in the recipe to develop the colour of specific ingredients:
- sesame seeds
- chicken
- snow peas
- soba noodles.

3 Why is the omelette cooked and cooled before it is used in the soba noodle salad?

4 Describe the physical changes that occurred to the chicken during the cooking process – consider changes in colour, texture and size.

5 How did you test the chicken to determine whether it was cooked?

6 Why were the soba noodles rinsed after the cooking process?

7 Outline the role of the dressing in the overall success of the soba noodle salad.

8 Describe the safe work practices you followed when:
- cutting the vegetables
- cooking the omelette
- boiling the soba noodles.

9 Discuss your success with the preparation of this recipe. Focus on:
- your cutting skills
- cooking ingredients to the right degree of doneness
- final presentation of the salad.

Suggest areas for improvement in future productions.

10 Evaluate the nutritional properties of the soba noodle salad by plotting the ingredients on a diagram of the Australian Guide to Healthy Eating.



Soba noodle salad

Mediterranean risotto

Although risotto is a classic dish of northern Italy, it is now considered to be part of the repertoire of most contemporary Australian cooks. This recipe uses Arborio rice, a variety that cooks to a plump, tender state and is therefore perfect for making risotto. This rice has the ability to absorb up to four times its own volume, a valuable property in risotto making. Arborio rice absorbs large quantities of stock, providing a creamy consistency and delicious flavour. This product would be suitable to compare with a similar commercially produced risotto.

¾ cup chicken stock
¾ cup water
2 teaspoons olive oil
½ onion, finely chopped
1 clove garlic, crushed
1 tablespoon pine nuts
½ cup Arborio rice
6 black pitted olives, sliced
2 tablespoons sun-dried tomatoes, chopped
½ cup cooked chicken diced in 2-centimetre cubes
¼ cup parmesan cheese
2 tablespoons cream
1 tablespoon basil, chopped
1 tablespoon shaved parmesan cheese to serve

METHOD

1. Heat the stock and water in a small saucepan.
2. Heat the olive oil in a medium-sized saucepan, add the onion and fry until soft, but do not allow to brown. Add the garlic and pine nuts.
3. Add the rice to the olive oil and stir to coat the grains with oil.
4. Stir in the hot stock, one-third at a time. Stir constantly over very low heat so the mixture is barely simmering, until the stock is absorbed. This process cannot be rushed and will take approximately 20 minutes. Taste test the rice to ensure it is al dente.
5. When all the stock has been absorbed, remove from the heat, cover and allow to stand for 10 minutes.
6. Return to the heat and stir in the remaining ingredients. Stir over a low heat for about 4 minutes.
7. Serve and garnish with shaved parmesan cheese.

SERVES 1

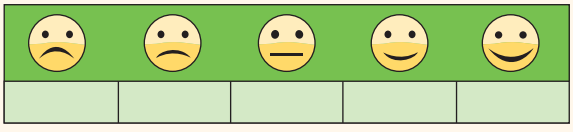
EVALUATION

1. Describe the sensory properties of the Mediterranean risotto using descriptive language.
2. Describe the difference in the physical and sensory properties between a cooked and an uncooked grain of rice.
3. What are the advantages of using Arborio rice when making risotto?
4. Explain why the rice is not washed before using it for making risotto.
5. Why is the rice stirred to coat it with oil before the liquid is added?
6. Explain the importance of making sure the stock is hot before adding it to the rice.
7. What effect does the constant stirring have on the texture of the finished risotto?
8. Explain why the risotto is cooked over a low heat rather than a high heat.
9. What is the purpose of removing the risotto from the heat, covering it and leaving it to stand for 10 minutes?
10. Evaluate the nutritional properties of the Mediterranean risotto by plotting the ingredients on a diagram of the Australian Guide to Healthy Eating. Explain why risotto is a popular meal with many Australian families.



Mediterranean risotto

QUANTITATIVE RESULTS		
	HOMEMADE	COMMERCIAL
Name of product		
Manufacturer		
Serving size		
Weight per serve		
Colour of product		
Key ingredients		
Nutrients per 100 grams		
Cost		

QUALITATIVE RESULTS USING A PREFERENCE TEST		
	HOMEMADE	COMMERCIAL
Sensory descriptors		
Appearance		
Aroma		
Flavour		
Texture		
Ratings		
Nine-point scale 1 = dislikes very much 5 = neutral 9 = likes very much		
Facial hedonic descriptor		

Coconut macaroons

This recipe for coconut macaroons will help you understand the stages in the beating of egg whites to optimise their properties and produce delicious biscuits. This knowledge will be helpful when beating egg whites in future recipes.

2 egg whites

½ cup icing sugar, sifted

½ teaspoon vanilla essence

1 cup desiccated coconut

¼ cup plain flour, sifted

3 glacé cherries, finely sliced

METHOD

1. Preheat oven to 180°C.
2. Line a baking tray with baking paper.
3. Beat the egg whites until firm peaks form.
4. Gradually beat in the icing sugar then add the vanilla essence.
5. Carefully fold in the coconut and plain flour with a metal spoon.
6. Spoon mixture onto tray in small mounds using a dessert spoon.
7. Decorate with a slice of glacé cherry.
8. Bake for 10–15 minutes or until a pale golden colour.
9. Cool on tray, then remove and store in an airtight container.

MAKES 12–15 MACAROONS



Coconut macaroons

EVALUATION

1. Why is it important to preheat the oven and have the tray prepared in advance in steps 1 and 2?
2. Explain why it is important to use eggs that are at room temperature.
3. Identify three important considerations when choosing a bowl in which to beat the egg whites.
4. Explain how you will know when the beaten egg whites have reached the firm peak stage.
5. What would happen if you left the beaten egg whites and went out to recess before completing the recipe?
6. Why is it important to gently fold in the coconut and flour?
7. What would happen to the mixture of egg whites, coconut and flour if the egg whites were only beaten to the soft peak stage?
8. Explain changes to the size and shape that occurred to the macaroons when they were cooked.
9. Describe the texture of the cooked coconut macaroons.
10. If you were to make these biscuits again, what changes would you make?

Praline

Praline or nut toffee is great to sprinkle on the top of custards and mousses, to fold through ice-cream, or as a sweet treat. Ground praline can be folded through whipped cream or used to top coffee meringue roulade or a pavlova, or mixed into melted dark chocolate and moulded into truffles. Most nuts are suitable – almonds, hazelnuts, walnuts, macadamias, pecans or pistachios.

50 grams nuts

½ cup A1 sugar

75 millilitres water

METHOD

1 Preheat oven to 200°C.
2 Spread the nuts in a single layer on a baking tray and roast until lightly browned.
3 Remove from the oven, cool and roughly chop the nuts. Line the tray with baking paper then spread out the chopped nuts.
4 Combine the sugar and water in a small heavy-based saucepan and stir over a low heat until the sugar dissolves. Wash down any sugar crystals from the side of the pan using cold water and a pastry brush. Do not stir after this stage to ensure that crystallisation does not begin.
5 Increase the heat and boil the mixture without stirring until it is a golden colour. Remove from the heat and pour over the nuts on the oven tray. Cool until the mixture is hard.
6 Break into pieces or process in a food processor to create a fine sprinkle.
7 Store in an airtight container.



Praline

EVALUATION

1 List four different types of nuts suitable for making praline.
2 Why is it possible to roast nuts in the oven without the addition of oil?
3 Describe the changes in the sensory properties of the nuts after they were baked in the oven in step 2.
4 Why is it important to wash down any sugar crystals from the side of the pan using cold water and a pastry brush when dissolving the sugar?
5 Why is it important not to stir the sugar syrup or toffee after the sugar has dissolved in step 4?
6 Discuss some of the safety issues when caramelising sugar to make the praline.
7 Describe the sensory properties of the freshly made praline.
8 Suggest two products you would be likely to make that would include praline.
9 Identify the significant nutrients available in the nuts and sugar of the praline.
10 What recommendations would you make for storing praline to maintain its optimum sensory properties?

Coffee meringue roulade

This recipe for a coffee meringue roulade is a contemporary take on one of Australia's classic desserts – the pavlova. A roulade is a soufflé-type mixture that is baked until it is firm but still moist, then spread with a filling and rolled up like a Swiss roll. It can be filled with flavoured whipped cream, a mixture of mascarpone cheese or Greek yoghurt and cream. Berries, chocolate, lemon curd, honey and banana can be added to the filling. Substituting coffee with wattleseed is a delicious way of including indigenous ingredients into sweet products.

melted butter for greasing

2 tablespoons cornflour for coating the tray

4 egg whites

¾ cup caster sugar

2 teaspoons cornflour

1 teaspoon vanilla

1 teaspoon vinegar

2 tablespoons ground roasted hazelnuts

2 tablespoons caster sugar, extra

FILLING

2 teaspoons instant coffee powder, dissolved in 1 teaspoon water

¾ cup thickened cream

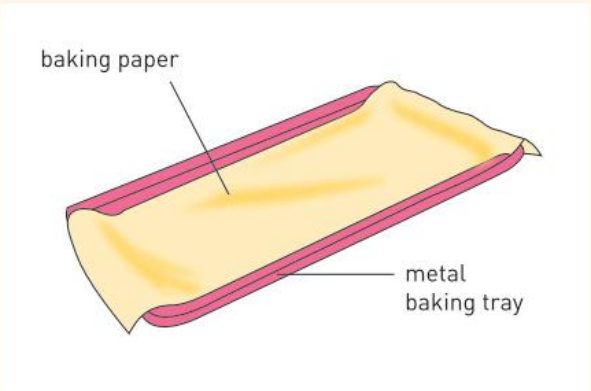
1 teaspoon vanilla

METHOD

1. Lightly grease a Swiss roll tin (25 × 38 centimetres).
2. Line the tin with baking paper, allowing a 2-centimetre overhang at both long ends.
3. Grease the baking paper lightly with a little melted butter and dust with cornflour. Shake the tin to remove the excess cornflour.
4. Preheat oven to 180 °C.
5. In a large bowl, beat the egg whites with an electric hand-held beater until soft peaks form. Gradually add the sugar, one tablespoon at a time, beating after each addition until the sugar is dissolved.
6. Sift the cornflour over the egg whites, add the vanilla and vinegar and fold through gently using a metal spoon.
7. Spread the mixture evenly in the prepared tin.
8. Sprinkle the meringue with the combined hazelnuts and extra sugar.
9. Bake for 10 minutes or until the meringue is firm to touch and a pale golden colour.
10. While the meringue is baking, prepare the filling by dissolving the instant coffee in 1 teaspoon of hot water.
11. Beat the cream until soft peaks form and fold through the coffee and vanilla. Cover and refrigerate until required.
12. Remove the meringue from the oven and turn onto a clean sheet of baking paper. Carefully remove the baking paper from the bottom of the meringue. The mixture is very delicate at this stage.
13. Cool flat to room temperature.
14. Spread the filling over the meringue, leaving a 1-centimetre border on all sides. Roll over the meringue, using the baking paper as a guide, along the long slide. Wrap the paper firmly around the roll to secure.
15. Place the seam side down and chill in the refrigerator. Remove the paper and slice the roll to serve.

Note: The roulade may crack when rolled but will still hold its shape.

SERVES 4–6



Lining a baking tray

EVALUATION

1 Describe the sensory properties of the coffee meringue roulade using descriptive language.
2 Why is lining the baking tray in a particular way important in the production of this recipe?
3 Describe the steps you took to prepare the egg whites so that they could be beaten to maximum volume.
4 Describe the appearance of egg white beaten to the soft peak stage.
5 Explain the difference between the processes of beating and folding.
6 Why is it important to keep the prepared cream filling refrigerated until needed?
7 What might happen to the roulade if the seam was not turned under when it was refrigerated?
8 Identify two safe work practices that you followed when using the electric hand-held beater.
9 Describe the type of meal or occasion where it would be appropriate to serve the coffee meringue roulade.
10 Outline the most challenging part of this production and make suggestions for improvements if you were to make the recipe again.



Coffee meringue roulade

Spiced lamb with garlic toast

A number of spices are used in this tasty dish. The marinade will add flavour and 'zing' to the low-fat lamb cuts used in this recipe. Serving the lamb on the garlic toast adds another flavour and great textural 'crunch' to the recipe.

2 lamb back straps, leg steaks or middle loin chops

seasonal greens

MARINADE

½ lemon, juiced

2 teaspoons tomato paste

1 teaspoon ground cumin

¼ teaspoon chilli paste (sambal olek)

1 clove garlic, crushed

1 teaspoon soy sauce

1 tablespoon oil, for frying

GARLIC TOAST

1 clove garlic, crushed

1 tablespoon olive oil

2 thick slices of crusty bread

METHOD

1. Preheat oven to 190 °C.
2. Combine all the marinade ingredients except the oil in a bowl. Add lamb and refrigerate for at least 30 minutes.
3. For the toast, combine the garlic and oil and brush both sides of the bread. Place on a baking tray and bake for 10 minutes or until just crisp and golden.
4. Drain lamb, heat oil in frying pan, add lamb and cook over high heat for 3–4 minutes each side for medium. Remove from pan, cover with foil and rest in a warm place for 10 minutes.
5. Slice the meat thinly and arrange on the garlic toast. Garnish with seasonal greens.

SERVES 1

EVALUATION

1. Describe the sensory properties of the spiced lamb with garlic toast using descriptive language.
2. Why is meat marinated?
3. In a marinade, which ingredients tenderise and which provide flavour to the dish?
4. Why is it important to cook the lamb quickly in hot oil?
5. Explain a method of testing the degree of doneness of the meat.
6. Why do diners enjoy a meal more if the meat is rested between cooking and serving?
7. Suggest other cuts and types of meat that could be used in place of the lamb.
8. Why is lamb promoted as a good meat to serve as part of an Australian Day event?
9. Research and identify two vegetable dishes and two salads that are currently on trend that could be served with the spiced lamb and garlic toast. Justify your selections.
10. Evaluate the nutritional properties of the spiced lamb with garlic toast by plotting the ingredients on a diagram of the Australian Guide to Healthy Eating.



Spiced lamb with garlic toast

Lamb and lentil soup

Lamb has historically been an important food in the Australian diet and is widely used in a variety of dishes. Lentils are an ancient crop that is now more widely cultivated in Australia. Lentils give a slightly nutty flavour and slightly chewy texture to this soup, and provide a good source of protein and dietary fibre.

2 teaspoons olive oil
200 grams lean chump chops, trimmed and diced into 1-centimetre cubes
½ onion, diced
½ stick celery, diced
½ carrot, diced
1 clove garlic, crushed
1 teaspoon fresh thyme
½ bay leaf
2 tomatoes, peeled and chopped
½ teaspoon ground black pepper
200 millilitres water
2 tablespoons green lentils
¼ teaspoon salt
parsley for garnish

METHOD

1. Heat the oil in a medium saucepan with a tight-fitting lid.
2. Brown the diced lamb well. Remove the lamb from the pan and sauté the onion, celery and carrot.
3. Return the lamb to the saucepan and add the garlic, thyme, bay leaf, tomato, black pepper and water. Cover and simmer for 15 minutes.
4. Rinse the lentils and add to the lamb mixture. Continue cooking for 30 minutes or until the lentils are tender. Check every so often in case extra water is needed in the saucepan.
5. Add the salt and adjust the seasoning before serving.
6. Garnish with chopped parsley.

SERVES 2



Lamb and lentil soup

EVALUATION

1. Describe the sensory properties of the lamb and lentil soup using descriptive language.
2. Draw a flow chart to demonstrate the steps in dicing a carrot.
3. Explain the process you used to peel the tomatoes.
4. Why were the onion, celery and carrot sautéed in step 2 of the recipe?
5. Identify and describe the process that occurs to the lamb when it is simmered in step 3 of the recipe.
6. Why was it important to cover the saucepan while the soup was simmering?
7. Explain how simmering differs from boiling.
8. Outline three safety rules to follow when cooking on a cooktop.
9. Lentils are part of the pulse family. Discuss why nutritionists encourage Australians to include this food group more frequently in everyday meals.
10. Evaluate the nutritional properties of the lamb and lentil soup by plotting the ingredients on a diagram of the Australian Guide to Healthy Eating.

Ragoût

A ragoût is a stew made from meat and vegetables cut into even-sized pieces and cooked in a thickened liquid that is well flavoured with herbs and seasonings. The milk balances the acidity of the tomatoes. It is made using a moist method of cooking and uses lean minced beef to reduce the cooking time. Variations could be made using cubes of meat and other vegetables.

1 tablespoon olive oil
¼ onion, finely diced
½ stick celery, finely diced
½ medium carrot, finely diced
200 grams lean minced beef
125 millilitres dry white wine or chicken stock
80 millilitres full-cream milk
pinch of freshly grated nutmeg
200 grams diced canned tomatoes
1 tablespoon tomato paste
pinch of salt and pepper

TO SERVE

180 grams dried spaghetti
1 tablespoon parsley, chopped
1 tablespoon grated parmesan cheese

METHOD

1 Select a heavy pan with a tight-fitting lid. Heat the oil over medium heat and sauté the onion until it is transparent. Add the celery and carrot and continue cooking for 2 minutes.
2 Crumble in the minced beef, stirring to ensure it separates. Cook only until the meat has lost its raw red colour. Then add the wine or stock and turn up the heat to medium high. Cook until the liquid has evaporated.
3 Return the heat to medium. Add the milk and nutmeg, and cook until the milk has evaporated. Stir frequently.
4 When the milk has evaporated, add the tomatoes and tomato paste and reduce the heat. Cover and simmer for 10–15 minutes. Season to taste.
5 Cook the spaghetti until al dente. Drain and serve with the ragoût. Garnish with chopped parsley and grated parmesan cheese.

Note: The ragoût can be refrigerated for 2–3 days, or frozen.

SERVES 2

EVALUATION

1 Describe the sensory properties of the ragoût using descriptive language.
2 Why is it important that all the vegetables are cut into pieces of similar size?
3 Why are the vegetables sautéed before the meat is added to the pan?
4 Why is the milk incorporated into this recipe?
5 If you wanted to make the colour of the ragoût more intense, what ingredients could you add?
6 Explain why in step 4 of the recipe the pan is covered and the ragoût is simmered for 10–15 minutes.
7 Suggest some other vegetables and herbs that could be used to make a variation of the ragoût recipe.
8 Suggest some other high-carbohydrate products that could be served instead of pasta to accompany the ragoût.
9 Compare the ingredients of the ragoût to those in a traditional bolognaise sauce. Which recipe would be more suitable for a person on a low-fat, high-fibre diet? Explain your answer.
10 Evaluate the ragoût by plotting the ingredients on a diagram of the Australian Guide to Healthy Eating. Comment on the nutritional value of the meal.



Ragoût

Indian-style fish cakes with quick mango chutney

Bite-sized finger food such as these Indian-style fish cakes are popular to serve when entertaining friends. Pouring boiling water over the fish poaches the delicate flesh without overcooking it. The fresh but slightly spicy flavour of these fish cakes is balanced by serving them with mango chutney. Fish cakes are a very healthy snack food as they are high in protein but low in fat.

Indian-style fish cakes

200 grams firm white fish, such as flake or ling
1 tablespoon vegetable oil
½ onion, finely diced
pinch of salt
1 clove garlic, crushed
2 centimetres fresh ginger, peeled and chopped
½ long green chilli, chopped finely
½ teaspoon ground cumin
½ teaspoon garam masala
1 egg
1 cup fresh breadcrumbs
2 tablespoons vegetable oil for frying
sprigs of fresh coriander for serving

METHOD

1. Place the fish in a heatproof bowl. Boil 3 cups of water and pour over the fish in the bowl. Cover the cling wrap and leave for 10 minutes. When cool, drain and flake fish, then set aside.
2. Heat 1 tablespoon of oil in a small frying pan over a medium heat and sauté the diced onion and a pinch of salt. Sauté for 3–4 minutes until the onion has softened but not browned.
3. Add the garlic, ginger, green chilli, cumin and garam masala, and cook for 2 minutes. Remove from heat and leave to cool.
4. Combine the flaked fish, onion and spice mix, egg and breadcrumbs and mix together.
5. Wet hands in cold water and shake off excess moisture, then roll the mixture into 2-centimetre patties.
6. Heat the 2 tablespoons of oil in a frying pan over medium heat. Fry the fish cakes for 2 minutes on each side until golden brown. Drain on paper towel.

Serve with mango chutney as a dipping sauce and fresh coriander.

Quick mango chutney

1 tablespoon vegetable oil
1 red onion, thinly sliced
2 garlic cloves, crushed
1 centimetre ginger, peeled and finely diced
1 mango, peeled and chopped
3 tablespoons caster sugar
3 tablespoons white wine vinegar

METHOD

1. Use a small saucepan and heat the oil over medium heat. Add the onion, garlic and ginger and sauté until the onion begins to soften.
2. Add the mango, sugar and white wine vinegar and bring to the boil. Reduce heat and simmer for 8–10 minutes until the mixture is thick and glossy. Stir regularly.

Serve as an accompaniment to the Indian-style fish cakes.

SERVES 2

EVALUATION

1 Describe the sensory properties of the Indian-style fish cakes with quick mango chutney using descriptive language.
2 Identify and explain the process that occurred to the fish when it was covered with the boiling water in step 1 of the recipe.
3 What is the purpose of cooking the spices for 2 minutes?
4 Explain the functional property of the breadcrumbs in the fish cakes.
5 Why is it important to wet your hands before rolling the fish cakes into patties?
6 List four safety considerations to observe when cooking the fish cakes in a frying pan.
7 What is the purpose of sautéing the onion, garlic and ginger when making the chutney?
8 Identify the functional property of the caster sugar and vinegar in the mango chutney.
9 Explain why nutritionists recommend that Australians increase their consumption of fish.
10 Evaluate the nutritional properties of the Indian-style fish cakes and quick mango chutney by plotting the ingredients on a diagram of the Australian Guide to Healthy Eating.



Indian-style fish cakes with quick mango chutney

Vietnamese-style fish cakes

Fish is an important source of protein in the diet of many Vietnamese people. These fish cakes are typical of many Vietnamese foods as they have a fresh flavour and crisp texture. They are high in protein and low in fat and, when served with the vermicelli salad in lettuce cups, they make a nutritiously balanced snack or light meal.

FISH CAKES

300 grams white fish

½ egg, lightly beaten

1 clove garlic, crushed

3 teaspoons fish sauce

2 spring onions, sliced

10 green beans, thinly sliced

3 tablespoons oil for frying

DRESSING

1 clove garlic, crushed

1 long red chilli, finely sliced

1 tablespoon caster sugar

2 tablespoons fish sauce

1 lime, juiced

TO SERVE

30 grams vermicelli rice noodles

6 sprigs mint

6 sprigs coriander

6 baby cos or iceberg lettuce leaves

METHOD

1 Soak the vermicelli rice noodles in hot water for 10 minutes then drain.
2 Roughly chop the fish into 1–2-centimetre pieces.
3 Place the fish, egg, garlic and fish sauce into a food processor and pulse until the mixture comes together as a paste but not smooth.
4 Remove the processor bowl and stir through the sliced spring onion and beans. Transfer to a plate, cover with cling wrap and refrigerate.
5 Prepare the dressing: in a small bowl combine the garlic, chilli, caster sugar, fish sauce and lime juice. Set aside.
6 Shape the fish mixture into small patties about 2 centimetres thick.
7 Heat the oil in a large frying pan over high heat then fry the fish cakes for 2 minutes on each side. Drain on paper towel.

To serve, lay out the lettuce leaves and use them like cups – distribute the mint, coriander, noodles and fish cakes. Spoon on the dressing and serve on a platter.

SERVES 2

EVALUATION

1 Describe the sensory properties of the Vietnamese-style fish cakes using descriptive language.
2 Explain what might happen if the noodles were boiled on the cooktop, rather than just covered in boiling water.
3 What is the functional property of the egg in the recipe for fish cakes?
4 Why is it important to pulse the ingredients in the food processor rather than processing at a high speed for 2 minutes?
5 What method of heat transfer is used to cook the fish cakes in the frying pan?
6 Explain the key principles of this method of heat transfer.
7 Explain why frying is described as a dry method of cooking.
8 List two safety considerations to observe when using frying techniques to cook the fish cakes.
9 Make some suggestions for improvements to this recipe if you were to make it again. Justify your recommendations.
10 Evaluate the nutritional properties of the Vietnamese-style fish cakes by plotting the ingredients on a diagram of the Australian Guide to Healthy Eating.



Vietnamese-style fish cakes

Roasted tomato tarts and caramelised onion tarts

Small, open tarts are a delicious lunch or entrée dish, and both tomatoes and caramelised onions make a great filling. The Roma tomato is often preferred in recipes because of its firm texture and elongated shape. Brown onion is used for its slightly sweeter flavour. The following recipe makes two roasted tomato tarts and two caramelised onion tarts. Prepare both and evaluate them to decide which you prefer as a lunch dish.

PASTRY

2 sheets puff pastry, approximately 22 square centimetres

1 tablespoon egg wash

CARAMELISED ONION TARTS

1 large brown onion

2 teaspoons olive oil

1 teaspoon brown sugar

30 grams feta cheese

ROASTED TOMATO TARTS

1 tablespoon tomato purée

2 teaspoons tomato paste

black pepper

1 large Roma tomato

1 clove garlic, crushed

2 teaspoons olive oil

salt and pepper

4 black olives, sliced

1 teaspoon fresh basil, chopped

1 tablespoon parmesan cheese



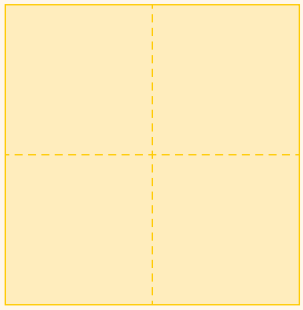
Roasted tomato tarts and caramelised onion tarts

METHOD

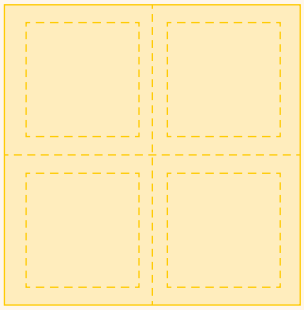
1. To prepare the filling for the caramelised onion tarts, cut the onion in half then place the flat side down on a chopping board and slice the onion thinly.
2. Heat the oil in a small pan, add the onion, cover with a lid and sauté gently until soft and just beginning to brown. Add the sugar and cook for a further 2 minutes. Cool.
3. Prepare the puff pastry for the base of the tarts by following the instructions in the diagram on the opposite page. Carefully lift the pastry squares onto a lightly greased oven tray.
4. Preheat oven to 200°C.
5. To prepare the roasted tomato tarts, mix the tomato purée and tomato paste together until smooth. Season with a little black pepper. Spread a tablespoon of the tomato mixture over each of the inner squares of pastry.
6. Cut the tomatoes lengthwise into four slices. Place the tomato slices over the tomato base. Top with a little of the crushed garlic, a few drops of olive oil, a little salt and pepper, a few slices of olive and some chopped fresh basil.
7. Sprinkle each of the tarts with a tablespoon of parmesan cheese.
8. Spread the cooled caramelised onions over the base of two of the pastry cases.
9. Top with crumbled feta cheese.
10. Brush the edges of the pastry of the tarts with the egg wash.
11. Bake for approximately 20 minutes or until the pastry is well puffed and golden brown. Serve warm.

MAKES 4 TARTS

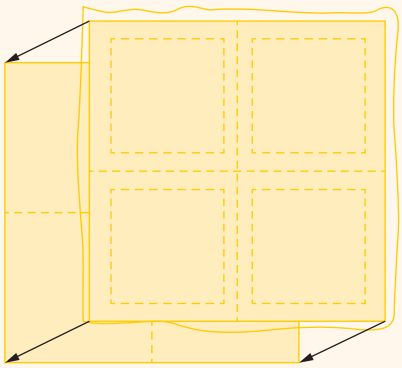
1. Cut one sheet of pastry into 4 equal squares, approximately 11.5 centimetres. Leave the backing sheet on the pastry.



2. Cut the second sheet into 4 equal squares. Cut a border 2 centimetres from each edge. Leave the backing sheet on the pastry.



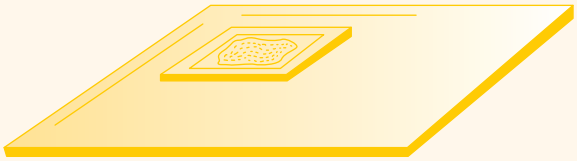
3. Lightly brush the first sheet of pastry with egg wash. Flip the second sheet carefully over the top using the plastic backing sheet for support.



4. Lift the plastic sheet off and carefully remove the centre squares so that only the outside is a double layer.



5. Carefully lift the pastry shells onto a greased oven tray. Top with tomato mix, tomato and parmesan or caramelised onion and feta cheese.



How to cut pastry for tarts

EVALUATION

1. Describe the sensory properties of both the roasted tomato tarts and caramelised onion tarts using descriptive language.
2. Why are Roma tomatoes recommended for the roasted tomato tarts? Explain why the skin is left on the tomatoes for this recipe rather than being peeled.
3. Predict the effect on the finished tarts of using tinned Roma tomatoes in this dish rather than fresh tomatoes.
4. Why are the onions for the caramelised onion tarts sautéed in step 1 of the recipe? What effect would it have on the finished product if this step were omitted?
5. What other ingredients could be added to the caramelised onion tarts to adapt this recipe?
6. Discuss the effect of dry heat on changing the physical properties of the pastry.
7. Describe two safe work practices you followed when using the oven to make this product.
8. Which tart did you prefer as a lunch dish? Justify your answer.
9. What accompaniments could you serve with the roasted tomato tarts and caramelised onion tarts so that they form a well-balanced meal?
10. Evaluate the nutritional properties of the roasted tomato tarts and caramelised onion tarts by plotting the ingredients on a diagram of the Australian Guide to Healthy Eating. Explain how the accompaniments you suggested in question 9 alter the nutritional properties of the meal.

Sweet potato parathas

Parathas are Indian flatbreads made with wholewheat flour and clarified butter or ghee. The paratha can be shaped into rounds, squares or triangles. They are often filled with a spicy vegetable filling and served with yoghurt.

DOUGH

½ cup wholemeal bread flour

½ cup white bread flour

¼ teaspoon salt

2 teaspoons ghee

cold water for mixing the dough

FILLING

100 grams sweet potato

1 potato

1 teaspoon oil

½ teaspoon cumin seeds

½ teaspoon black mustard seeds

¼ teaspoon salt

oil for frying

METHOD

Making the dough

1 To make the dough, sift both flours and salt into a large bowl.
2 Make a well in the centre of the dough, add the ghee and gradually mix in enough cold water to make a soft dough.
3 Turn the dough out onto a floured bench and knead for approximately 5 minutes or until smooth and elastic.
4 Cover with cling wrap and rest on bench for 30 minutes.

Making the filling

1 Peel the sweet potato and potato and cut into 2.5-centimetre pieces.
2 Place in a small saucepan and just cover the diced potatoes with cold water. Cover and bring to boil. Simmer until the vegetables are tender then drain. Mash the sweet potato and potato together.
3 In a separate saucepan, combine the oil, cumin, mustard seeds and salt, and cook until the seeds begin to pop. Add to the mashed potato.

Making and cooking the parathas

1 To make the parathas, divide the dough into eight pieces, then roll each piece on a floured bench into a round paratha of 14 centimetres. Keep each paratha separate and cover with a clean tea towel to prevent the dough drying out.
2 Divide the filling into four portions and spread over the four parathas, leaving a 1-centimetre border on each. Brush the border with water and top each one with the remaining paratha. Press the edges together to seal.
3 In a large frying pan, heat 2 tablespoons of oil. When hot, cook one filled paratha at a time. Both sides should be golden brown. Drain on paper towel and keep warm in the oven until serving.

MAKES 4 LARGE PARATHAS

EVALUATION

1 Describe the sensory properties of the sweet potato parathas using descriptive language.
2 What is ghee and why is it used in this recipe?
3 Explain how you could judge when you had used sufficient water to make the dough.
4 Explain why it is important to knead the paratha dough for 5 minutes. How will this affect the sensory properties of the parathas?
5 Why is it important to rest the dough for 30 minutes before rolling it out?
6 Identify another method of cooking the sweet potato and potato for the filling other than boiling and describe the stages in the cooking process.
7 Explain why the spice seeds are fried in oil in step 3 of the filling.
8 Suggest two modifications you could make to the filling of the parathas if you were to make them again.
9 Describe two safety rules to follow when boiling and shallow frying.
10 Plot the ingredients of the sweet potato parathas on a diagram of the Australian Guide to Healthy Eating and comment on their nutritional value as a snack food.



Sweet potato parathas

Meatball and tomato soup

In this recipe the capsicum is roasted in the oven to develop its flavour, soften the texture and make the skin easy to remove. The onion and garlic are shallow-fried to develop the flavour and create a soft texture. The vegetables are simmered to blend the flavours of the soup and cook the pasta. The meatballs are simmered to cook the proteins and ensure they retain their shape.

MEATBALLS

250 grams chicken or pork mince
½ cup fresh breadcrumbs
1 clove garlic, crushed
1 tablespoon parsley, finely chopped
2 tablespoons grated parmesan
1 egg
salt and pepper
1 tablespoon oil

SOUP

1 red capsicum
olive oil spray
2 tablespoons olive oil
20 grams butter
1 onion, finely diced
1 clove garlic, crushed
800 grams chopped canned tomatoes
¼ teaspoon dried oregano
2 cups water
¼ teaspoon salt
½ cup small soup pasta
fresh basil for garnish

METHOD

Making the meatballs

Mix all the ingredients together except the oil. Roll into small balls (each ball should be about one teaspoonful of the mix) and fry until just brown.

Making the soup

1. Preheat oven to 220°C. Spray the whole capsicum lightly with oil and place on a baking tray. Roast until the skin of the capsicum is brown and has blistered. Remove from oven, wrap in foil and cool.
2. In a large saucepan, heat the oil and butter and gently sauté the onion and garlic just until they are a pale golden colour.
3. Add the tomatoes, oregano, water and salt and bring to boil. Cover the saucepan and simmer for 20 minutes.
4. Peel the skin, remove the core and seeds from the capsicum and cut the flesh finely. Add to the tomato soup.
5. Add the pasta to the soup and cook for 5 minutes before adding the meatballs.
6. Gently lower the meatballs into the soup and simmer for 10 minutes or until the meatballs are cooked through and the pasta is soft.
7. Serve and garnish with chopped fresh basil.

MAKES 2 LARGE PORTIONS

EVALUATION

1 Describe the sensory properties of the meatball and tomato soup using descriptive language.
2 Describe the physical changes that occurred when the whole capsicum was roasted.
3 How did you peel the hot capsicum safely to avoid burning your fingers?
4 Why were the onion and garlic sautéed before the other ingredients were added to the soup?
5 In step 3 of the soup recipe, why was the saucepan covered during the simmering stage?
6 Identify the process that occurs to the pasta when it is cooking in the soup.
7 Explain the functional property of the egg in the meatball mixture.
8 Discuss the importance of simmering, rather than boiling the meatballs in the soup.
9 Identify the process that occurred to the meatballs when they were fried and simmered for the soup.
10 Evaluate the nutritional properties of the meatball and tomato soup by plotting the ingredients on a diagram of the Australian Guide to Healthy Eating and explain why the soup is an ideal food for lunch.



Meatball and tomato soup

Pear and parmesan salad with lemon chicken bites

This recipe features fresh pears in a savoury dish, adding texture, a contrasting colour and sweet flavour. Shallow-frying is used to cook the lemon chicken bites and the vinaigrette is an example of a temporary emulsion.

LEMON CHICKEN BITES

2 slices white bread, crusts removed

⅓ cup milk

200 grams minced chicken

2 tablespoons grated parmesan cheese

1 clove garlic, crushed

salt and pepper

1 tablespoon parsley, chopped

zest of 1 small lemon

1 tablespoon oil for frying

PEAR AND PARMESAN SALAD

2 cups mixed salad leaves, for example rocket leaves and other lettuce varieties

¼ cup pecan nuts, chopped in half lengthwise

2 tablespoons spring onions, chopped

1 firm pear, peeled, cut into quarters and sliced just before combining

DRESSING

2 tablespoons olive oil

1 tablespoon cider vinegar

salt, ground black pepper to taste

1 tablespoon shaved parmesan cheese to garnish

METHOD

Making the lemon chicken bites

1. Soak the slices of bread in milk for a few minutes, and then squeeze to remove excess moisture.
2. Combine all the ingredients except the oil in a bowl.
3. Work the mixture together by hand, until well combined.
4. Wet your hands and roll the mixture into walnut-sized balls. Refrigerate while preparing the salad and the dressing.
5. Heat the oil in a frying pan, add the balls of chicken and fry, turning gently until cooked through.
6. Drain the lemon chicken bites on paper towel and allow to cool.

Making the pear and parmesan salad

1. Place the salad leaves, pecans and spring onions in a bowl.
2. Prepare the pear and add the slices to the salad.
3. To prepare the dressing, place the olive oil and vinegar in a lidded jar, add the seasonings, and shake to combine.
4. Add the dressing to the salad and toss to combine.
5. Place the lemon chicken bites on a bed of the salad. Garnish with the shaved parmesan cheese.

SERVES 2

EVALUATION

1 Describe the sensory properties of the pear and parmesan salad with lemon chicken bites using descriptive language.
2 What is the purpose of using bread soaked in milk in the lemon chicken bites?
3 Why is it advisable to wet your hands when shaping the lemon chicken bites?
4 What safety precautions would you take when frying the lemon chicken bites?
5 Identify and describe the process that occurs to the protein in the meat when the meatballs are fried.
6 Identify three other types of nuts that could be used instead of pecans in this recipe.
7 Why would it be unwise to 'dress' the salad one hour before serving?
8 What sensory properties would be altered if the pear was cut early in the preparation of the dish, rather than just before serving?
9 How could you treat the pear if you wished to prepare it in advance?
10 Evaluate the nutritional properties of the pear and parmesan salad with lemon chicken bites by plotting the ingredients on a diagram of the Australian Guide to Healthy Eating.



Pear and parmesan salad with lemon chicken bites

Double chocolate biscuits

These biscuits are chocolatey and delicious filled either with the chocolate custard, or strawberry or raspberry jam. Choose your favourite cookie cutter shape to make the biscuits. You could cut them into heart shapes if you wanted to make them for Valentine's Day. If production time is short, the biscuit pastry can be made the day before and refrigerated. Two cooking techniques are used in production – baking and boiling. Biscuit making is ideal for involving children in food preparation, particularly if preparing them as a special treat or a gift.

BISCUIT PASTRY

125 grams butter, softened

¾ cup brown sugar

1 egg, lightly beaten

1½ cups flour

¼ cup self-raising flour

¼ cup Dutch cocoa

CHOCOLATE FILLING

2 tablespoons custard powder

2 tablespoons caster sugar

1 cup milk

60 grams 70% dark chocolate

or

strawberry or raspberry jam

cocoa powder for dusting

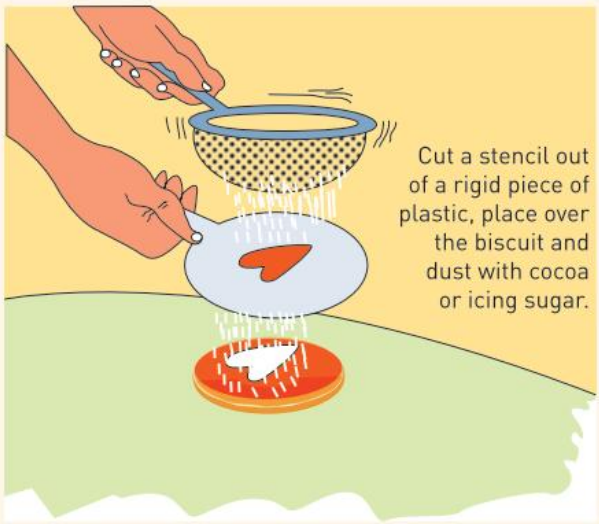
METHOD

1. In a large bowl, cream the butter and sugar together until light and fluffy. Gradually beat in the egg.
2. Sift the dry ingredients and add to the butter mixture. Mix well and bring the mixture together in a soft ball. Flatten the ball into a disc, wrap with cling wrap and refrigerate for 20 minutes.
3. Meanwhile, make up the filling. In a small saucepan, blend the custard powder, sugar and milk. Break up the chocolate and add to the saucepan. Over medium heat, bring the chocolate custard to the boil, stirring continuously. Remove from heat and transfer to a small bowl. Cover the surface of the chocolate custard with cling wrap and refrigerate until required.
4. Lightly grease two oven trays and preheat oven to 180°C.
5. Cut the biscuit pastry in half and lightly flour the work bench. Roll out the pastry until 4 millimetres thick and cut shapes using a biscuit cutter – heart-shape or fluted round. Use a spatula to transfer the biscuits to a baking tray as the pastry will be soft. The biscuits can be placed close together as they only spread a little. Roll out the remaining pastry.
6. Bake biscuits for 12 minutes. Lift with a metal spatula then cool on the tray. The biscuits will become firm as they cool.
7. Pair up the biscuits and fill with chocolate custard.
8. Dust the top biscuit with extra cocoa. You could use a cut-out shape to decorate the biscuits.

MAKES 12–15 FILLED BISCUITS

EVALUATION

1 Describe the sensory properties of the biscuits using descriptive language.
2 Describe the difference between Dutch cocoa and traditional cocoa.
3 Why does this recipe use a small quantity of self-raising flour as well as plain flour in the biscuit pastry?
4 Explain how you can tell if the butter and sugar have been creamed sufficiently.
5 Why is it important to stir the egg into the creamed butter and sugar gradually rather than all at once?
6 Why is it important to chill the pastry before rolling out?
7 Name the process that causes the custard filling to thicken.
8 Why does the recipe recommend covering the surface of the custard with cling wrap while it is being refrigerated?
9 What is the advantage of cutting the pastry into two before rolling it out?
10 Explain how you could store the biscuits if you wanted to make them a few days before serving them.



Using a heart-shaped cut-out to decorate the biscuits



Double chocolate biscuits

Chicken with sundried tomato marinade served on couscous

This recipe uses a couscous base on which to serve the marinated chicken fillet. The couscous is a good source of carbohydrate and the vegetables are high in dietary fibre, both valuable components of a healthy diet.

1 chicken breast fillet

SUNDRIED TOMATO MARINADE

1 clove garlic, crushed

1 tablespoon sundried tomatoes

¼ teaspoon black pepper

1 tablespoon lemon juice

1 tablespoon olive oil

COUSCOUS

8 centimetres carrot, finely diced

8 centimetres celery, finely diced

⅙ capsicum, finely diced

⅓ cup water

5 grams butter

⅓ cup couscous

1 tablespoon parsley, finely chopped

1 tablespoon chives, snipped finely

1 tablespoon basil, cut into fine strips

5 grams butter, extra

wedge of lemon for garnish

METHOD

1 Place the garlic, sundried tomatoes, pepper, lemon juice and oil into a food processor and roughly chop.
2 Cut the chicken breast fillet lengthwise into three strips.
3 Toss the strips of chicken in the sundried tomato marinade. Cover and refrigerate for 30 minutes.
4 Preheat oven to 180 °C. Place the chicken strips on a baking tray lined with baking paper. Alternatively, chicken strips could be cooked on an oiled baking tray for a firmer texture.
5 Blanch the carrot, celery and capsicum.
6 In a small pan, combine the water and 5 grams of butter. Cover and bring to the boil. Sprinkle in the couscous and cover with a lid. Remove from the heat and allow to stand for 3–5 minutes. Fluff with two forks.
7 Stir in the diced, blanched vegetables, chopped herbs and extra butter.
8 To serve, heap the couscous on a plate and arrange the chicken. Garnish with lemon wedge.

SERVES 1

EVALUATION

1 Describe the sensory properties of the chicken with sundried tomato marinade served on couscous using descriptive language.
2 List the preparation processes and the cooking methods used in this dish.
3 Explain why chicken is considered to be a high-risk ingredient for food poisoning.
4 List the steps you took to minimise the likelihood of cross-contamination when preparing this recipe.
5 Why is the chicken marinated before baking?
6 Why is oven baking the chicken a healthier option than pan-frying?
7 What is couscous made from? What precautions need to be taken to prevent the couscous becoming gluggy?
8 Why were the vegetables blanched before they were added to the couscous?
9 Suggest other types of meat and vegetables that could be prepared with the same marinade and couscous base.
10 Evaluate the nutritional properties of the chicken with sundried tomato marinade served on couscous by plotting the ingredients on a diagram of the Australian Guide to Healthy Eating.



Chicken with sundried tomato marinade served on couscous

Raspberry and yoghurt cake

Yoghurt is used in cake baking to develop a very moist and tender texture. It also extends the shelf life of the cake by reducing the rate of staling. The creaming method is used as it incorporates air into the mixture and, along with the chemical raising agents, helps to create a cake with a light texture. The raspberries are stirred through frozen as this helps to keep them suspended in the cake and prevents them from breaking up.

TOPPING

20 grams butter

1½ tablespoons flour

1½ tablespoons sugar

¼ teaspoon cinnamon

¼ cup flaked almonds

CAKE

¾ cup plain flour

1 teaspoon baking powder

100 grams butter, at room temperature

½ cup caster sugar

1 egg, lightly beaten

½ teaspoon vanilla essence

¼ cup Greek yoghurt

100 grams frozen raspberries

METHOD

1 Grease and line an 18-centimetre round tin or a 20-centimetre ring tin. Alternatively, use a round foil container – this does not need to be lined.

2 Preheat oven to 180°C.

Making the topping

Combine the butter, flour, sugar and cinnamon, and rub in the butter to form a crumble. Stir through the flaked almonds and set aside in a cool place until needed. Refrigerate if the kitchen is very hot.

Making the cake mixture

1 To make the cake mixture, sift the flour and baking powder together.

2 In a large bowl, cream the butter and sugar until light and fluffy and pale in colour.

3 Gradually beat in the egg until well combined. Add the vanilla essence.

4 Stir in half of the sifted flour and baking powder. Stir in the Greek yoghurt. Then stir in the remaining sifted flours and baking powder.

5 Fold the frozen raspberries through the cake mixture and place in the lined cake tin. Sprinkle the crumble topping over the cake and bake for 25–30 minutes.

EVALUATION

1 Describe the sensory properties of the raspberry and yoghurt cake using descriptive language.

2 Explain how you would store the following ingredients to ensure food safety:
- butter
- flour
- eggs
- flaked almonds
- yoghurt.

3 Why is yoghurt used as an ingredient in the raspberry and yoghurt cake rather than milk?

4 Describe the most effective way to rub butter into dry ingredients.

5 Explain why the topping for the cake is prepared and may be refrigerated before the cake mixture is made.

6 Identify the factors that contribute to the leavening of this cake:
- chemical
- mechanical.

7 If yoghurt were not available, what other dairy products could you use successfully as a substitute? Justify your answer.

8 Outline the most successful aspects of this production and identify changes you would make if you made the cake again.

9 Identify two safety considerations that you took into account when using electric beaters to cream the butter and sugar for this recipe.

10 Evaluate the nutritional properties of the raspberry and yoghurt cake by plotting the ingredients on a diagram of the Australian Guide to Healthy Eating. Explain why cakes should only be eaten occasionally and in small amounts.



Raspberry and yoghurt cake

Old-fashioned cream scones

Scones with jam and cream are a favourite morning or afternoon treat for many people. These scones are made with cream as well as milk to enrich the flavour and produce a lighter texture than would be achieved by simply using milk. While scones such as these do add a small amount of fat to the diet, eating them with butter, jam or cream significantly increases their fat and sugar content.

2 cups self-raising flour

½ teaspoon salt

30 grams butter

150 millilitres thickened cream

150 millilitres full-cream milk

METHOD

1 Preheat oven to 220 °C. Lightly grease an oven tray.
2 Sift the flour and salt. Rub the butter into the flour.
3 Stir in the cream and milk using a spatula. Mix to a very soft dough, adding a little extra milk if necessary.
4 Turn onto a lightly floured bench and knead very gently for 30 seconds until just smooth.
5 Press out with the fingers or roll out very lightly to approximately 2 centimetres thick.
6 Cut out with a plain scone cutter or cut into squares using a sharp knife.
7 Place on the prepared tray and bake for 10–12 minutes until well risen, golden brown and firm to touch.
8 Remove from the tray and wrap in a clean tea towel until cool. This prevents the scones from becoming hard on the outside.
9 Serve with jam and cream.

MAKES 9–12 SCONES

EVALUATION

1 Outline two functions of cream in this recipe.
2 Explain why the recipe recommends using a spatula to stir in the milk and cream rather than a spoon.
3 Explain why it is important to only knead the mixture gently when making scones.
4 Why is it important to cook the scones at 220 °C rather than at 160 °C?
5 Explain how heat is transferred in the oven to cook the scones.
6 Describe one way to test whether the scones are cooked, apart from than those listed in the recipe.
7 Select a commercially produced scone and complete an analysis of the physical and sensory properties of your old-fashioned cream scones and the commercially available scone.
8 Record your results in a table like the one here.

PROPERTIES	OLD-FASHIONED CREAM SCONES	COMMERCIAL SCONES
Height		
Colour		
Texture		
Mouthfeel		
Flavour		

9 How do the old-fashioned cream scones compare with the commercial scones in terms of their flavour, texture and mouth-feel?
10 Is there any significant difference in the height or colour of the scones? Explain.
11 Which type of scone do you prefer? Justify your answer.



Old-fashioned cream scones

Minestrone soup

Preparing this hearty minestrone soup provides an opportunity to practise your cutting skills. The vegetables are sautéed to develop their flavour and, as occurs when stir-frying, the hard vegetables are added to the hot oil first because they take a little longer to cook. The soup is boiled and simmered to tenderise the ingredients and blend their flavours. When making soup, the liquid often evaporates during cooking, so make sure you adjust the consistency prior to serving – extra stock or water can be added.

1 tablespoon oil

½ onion, diced

⅓ carrot, diced

⅓ stick celery, sliced

4 green beans, sliced into 1-centimetre lengths

½ potato, diced

1 clove garlic, crushed

1 cup chopped cabbage

1 cup vegetable or beef stock

1 cup water

200 grams canned diced tomatoes

1 tablespoon tomato paste

1 tablespoon small pasta

1 tablespoon canned cannellini beans, drained and rinsed

salt and pepper (optional)

2 teaspoons parsley, finely chopped

2 teaspoons grated parmesan cheese

METHOD

1. Heat oil in a large saucepan and sauté the vegetables. Begin with the onion, then add the carrot, celery, green beans and potato. Allow 30 seconds between each addition to develop the flavours.
2. Add the garlic and cabbage, and cook until the cabbage has wilted.
3. Add stock, water, canned tomatoes and tomato paste, and bring to the boil. Cover and reduce heat. Simmer for 20 minutes or until the vegetables are almost tender. Add more water if too much liquid evaporates and the mixture becomes too thick.
4. Stir in pasta and cannellini beans and cook for a further 10 minutes.
5. Test the flavour and add salt and pepper if required.
6. Serve garnished with chopped parsley and grated parmesan cheese.

SERVES 2



Minestrone soup

EVALUATION

1 Describe the sensory properties of the minestrone soup using descriptive language.

2 Which tools would you use to dice the onion, carrot and potato efficiently?

3 Describe how you would crush the garlic with a knife.

4 Identify two important safety considerations when washing up the knives used in the preparation of this recipe.

5 Explain why the vegetables are sautéed before liquid is added to the soup.

6 Boiling and simmering are both methods of cooking used in this recipe. Explain the difference between boiling and simmering.

7 Why it is important to add the cannellini beans only 10 minutes before the soup is cooked?

8 Select a commercially available canned minestrone soup and complete an analysis of the physical and sensory properties of your homemade minestrone soup and the commercial, canned minestrone.

- Check the label of the commercial soup to determine any preservatives or additives contained in the soup.
- You could use a nutrient analysis software program to calculate the nutrients in your homemade minestrone soup. A good example is the Food Standards Australia New Zealand Nutrition Panel Calculator, available online.

Record your results in a table like the one below.

PROPERTIES	HOMEMADE MINESTRONE	COMMERCIAL MINESTRONE
Appearance		
Aroma		
Brightness of colour		
Mouthfeel		
Depth of flavour		
Variety of vegetables in the soup		
Energy per 100 grams		
Fat per 100 grams		
Total carbohydrates per 100 grams		
Fibre		
Protein per 100 grams		
Salt per 100 grams		
Preservatives and additives used		

9 What factors would you take into account when considering whether to cook a minestrone soup from scratch or to purchase a commercially available minestrone soup? Explain your answer.

10 Plot the ingredients for the minestrone soup on a diagram of the Australian Guide to Healthy Eating and explain why the soup might be considered an ideal meal for lunch.

Savoury chicken parcels with mango and capsicum salsa

This recipe for savoury chicken parcels is great to prepare if time is short and a meal needs to be planned and prepared in advance. When baked, the filo pastry forms a crisp crust around a tender chicken fillet. The chicken in this recipe provides a good source of protein and the cheese adds some calcium to the meal.

SAVOURY CHICKEN PARCEL

1 large mushroom
10 grams butter
3 sheets filo pastry
1 small chicken fillet
1 slice of cheddar cheese
1 slice of ham

MANGO AND CAPSICUM SALSA

¼ mango, peeled and diced
⅙ red capsicum or avocado, finely diced
⅛ small red onion, finely diced
¼ small red chilli, finely chopped
2 teaspoons fresh mint, finely chopped
½ lime, juiced
salt and pepper
1 cos lettuce leaf

METHOD

Making the savoury chicken parcel

1 Preheat oven to 180°C. Lightly grease an oven tray.
2 Slice the mushroom thinly.
3 Melt the butter in a small saucepan or in the microwave. Brush one sheet of the filo pastry with the butter. Place the second sheet on the top. Brush with butter and place the third sheet of filo on the top.
4 Place the chicken fillet on the bottom edge of the pastry. Top with the slice of cheese and the mushroom slices. Place the ham on the top of the mushrooms.
5 Fold in the edges of the pastry and then roll up to form a parcel. Make three cuts on the top.
6 Place on the oven tray and brush with the remaining melted butter.
7 Bake for 25–30 minutes until the pastry is golden and crisp and the chicken is cooked through.
8 Remove from the oven. Serve with the mango and capsicum or avocado salsa in a lettuce cup.

Making the salsa

1 Combine all ingredients except the cos lettuce and mix gently.
2 Serve the mango and capsicum salsa in the cos lettuce cup. Avocado can be used in place of capsicum.

SERVES 1



Savoury chicken parcel with mango and capsicum salsa

EVALUATION

1 Describe the sensory properties of the savoury chicken parcel with mango and capsicum salsa using descriptive language.
2 Explain why the chicken parcel recipe suggests preheating the oven.
3 How could you prevent the filo pastry from drying out if you were to make several of the savoury chicken parcels?
4 Explain how you ensured that there was no cross-contamination between ingredients when making the meal.
5 Identify two other herbs that could be used in making the salsa if mint were not available.
6 What method of heat transfer is used to cook the chicken parcels in the oven?
7 Explain the key principles of this method of heat transfer.
8 List two rules to follow to use the oven safely.
9 Make some suggestions for improvements to this recipe if you were to make it again. Justify your recommendations.
10 Evaluate the nutritional properties of the savoury chicken parcel with mango and capsicum salsa by plotting the ingredients on a diagram of the Australian Guide to Healthy Eating.

Cheesy schnitzels with pressed parmesan potatoes

Schnitzel is a popular way of serving meat for a main course. The addition of parmesan cheese to the crumbs gives a delicious cheesy flavour to the crust. Frying is a dry method of cooking that adds an appealing flavour and texture to food. This dish makes a hearty family meal when served with pressed parmesan potatoes and a green salad or coleslaw.

Cheesy schnitzels

2 thin slices yearling beef

1 egg

2 tablespoons milk

a pinch of salt

⅓ cup finely grated parmesan cheese

1 cup dried breadcrumbs

2 tablespoons flour

3 tablespoons oil

40 grams butter

METHOD

1. Flatten the beef with a meat mallet until it is approximately half a centimetre thick.
2. Trim off any sinew from around the edge if necessary.
3. Beat the egg, milk and salt together lightly.
4. Mix parmesan cheese and breadcrumbs together on a plate.
5. Dust the meat with the flour and shake off any excess.
6. Dip the floured meat into the egg mixture.
7. Finally, coat the meat with the breadcrumb and parmesan mixture.
8. Place the crumbed schnitzel on a tray and refrigerate for 20–30 minutes.
9. Heat the oil in a frying pan; when hot, add the butter.
10. When foaming, fry the crumbed schnitzels until golden brown. Turn and cook the other side.
11. Drain on paper towel. Serve with pressed parmesan potatoes and a green salad.

SERVES 2

Pressed parmesan potatoes

2 potatoes

spray oil

2 tablespoons parmesan cheese

1 spring onion, chopped

METHOD

1. Preheat oven to 200°C.
2. Place the potatoes on a microwave-safe dish and microwave on high for 5 minutes.
3. Transfer the potatoes to an oven tray and bake for approximately 20 minutes until cooked through.
4. Using a potato masher, press each potato firmly until slightly crushed.
5. Spray each one with oil and sprinkle with parmesan cheese and chopped spring onion.
6. Return to the oven and bake for a further 10 minutes.



Cheesy schnitzels



Pressed parmesan potato

EVALUATION

1 Describe the sensory properties of the cheesy schnitzel and pressed parmesan potatoes using descriptive language.
2 How does flattening the meat with a mallet influence the sensory properties of the final product?
3 Why is it important to trim the sinew from the meat before coating and cooking?
4 Explain the purpose of flouring the meat before placing it in the egg mixture.
5 What would happen to the crumbed coating if the schnitzel were not chilled before cooking?
6 How did you determine if the oil was hot?
7 Why is it important to turn the schnitzel only once during cooking?
8 Why is frying considered to be a dry method of cooking?
9 Identify two important safety considerations when cooking in a:
   - frying pan
   - microwave oven
   - oven.
10 Evaluate the nutritional properties of the cheesy schnitzels and pressed parmesan potatoes by plotting the ingredients on a diagram of the Australian Guide to Healthy Eating.

Coleslaw

The aim is to compare the use of a food processor to make coleslaw with the use of the following traditional hand-held tools:

- a cook's knife
- a vegetable knife
- a grater
- a peeler
- a food processor
- attachments – grating disc, shredding disc, chopping blade

⅛ cabbage

1 large stick celery

¼ white or red salad onion

1 small carrot

¼ red capsicum

2 tablespoons sultanas (optional)

⅓–½ cup coleslaw dressing

METHOD

1 Divide each of the ingredients in half.

2 Use one half of the ingredients to prepare a quantity of coleslaw using traditional hand-held tools and the second half of the ingredients to prepare a quantity of coleslaw using a food processor.

3 Calculate the time taken to prepare the coleslaw by each method from the beginning of the preparation to the end of the washing up of utensils and equipment.

Using hand-held equipment

1 Shred the cabbage using the cook's knife. Place in a medium-sized mixing bowl.

2 Slice the celery finely using the vegetable knife and add to the bowl.

3 Dice the onion finely using the cook's knife and add to the bowl.

4 Peel the carrot with the vegetable peeler, then grate and add to the bowl.

5 Dice the capsicum using the vegetable knife and add to the bowl.

6 Add the sultanas and pour half of the dressing over the mixture in the bowl and stir.

7 Wash the utensils.

Using the food processor

1 Using the chopping blade attachment, chop the onion. Leave the chopped onion in the bowl. Remove the blade.

2 Using the grating disc, grate the carrot. Remove the disc.

3 Using the slicing disc, slice the celery.

4 Continuing to use the slicing disc, roll the cabbage leaves and push them down the feed tube to shred.

5 Remove the contents of the processor bowl and transfer to a medium-sized mixing bowl.

6 Using the vegetable knife, dice the capsicum and add to the bowl.

7 Add the sultanas and toss with the remaining dressing.

8 Wash up the utensils and equipment.

Results

Record your results in a table similar to the one below.

EQUIPMENT AND TOOLS FOR PREPARING SALAD	METHOD 1 USING HAND-HELD EQUIPMENT	METHOD 2 USING THE FOOD PROCESSOR
Time taken to prepare and wash up		
Degree of difficulty in the operation of tools and equipment		
Appearance of final product: • texture variation • degree of professional finish		
Safety: Which piece of equipment or tools provided the greatest safety risks?		
Ease of cleaning the utensils and/or equipment		

Analysis

1 Which method took the longest? Why?
2 Did you have any difficulty operating any tool or piece of equipment? Explain your answer.
3 Discuss the sensory properties of the finished salads. Was one salad more aesthetically appealing than the other?
4 Which ingredients benefitted the most from their preparation in the food processor?
5 When preparing the salad in the food processor, why was it necessary to prepare the ingredients in a different order from Method 1?
6 Why was it necessary to also use a vegetable knife when carrying out Method 2?
7 Would Method 2 be suitable for a person who has severe arthritis and limited use of their hands?
8 Would you recommend the purchase of a food processor for an elderly person living alone?
9 On what occasions would the use of the food processor be particularly useful?
10 Which method required most time to wash and clean up after the salad preparation?

Conclusion

1 Would you recommend the use of traditional tools or a food processor for making coleslaw for a large family gathering? Justify your answer.
2 Which method would you use if you wanted to prepare a small quantity to serve at a dinner party? Why?



Coleslaw

Little gluten-free chocolate cakes

These little cakes are suitable for people with coeliac disease. They are delicious to eat and ensure people who cannot tolerate wheat flour don't miss out on chocolate cake.

CHOCOLATE GLAZE

45 grams dark chocolate

1 tablespoon pure cream

CAKES

6 patty papers

90 grams dark chocolate

¼ cup rice flour

⅓ cup gluten-free self-raising flour

90 grams butter

½ cup caster sugar

2 egg yolks

30 grams ground almonds

2 egg whites

1 tablespoon caster sugar, extra

METHOD

1. Prepare the chocolate glaze: place the chocolate and cream in a small bowl and melt gently over hot water until the glaze is smooth and shiny.
2. Remove the bowl from the hot water and leave in a cool place to thicken.
3. Preheat oven to 180 °C. Place patty papers in patty tins.
4. Melt the chocolate for the cake over hot water and stir until smooth. Allow to cool.
5. Sift the flours together.
6. Cream the butter and sugar together with a wooden spoon until light and fluffy.
7. Add the egg yolks one at a time and beat well after each addition.
8. Stir in the ground almonds and chocolate.
9. Beat the egg whites until soft peaks form. Add the extra tablespoon of caster sugar and beat for another minute until the egg white looks glossy.
10. Using a plastic spatula, alternately fold the egg white and sifted flour into the chocolate mixture.
11. Spoon the mixture evenly into the paper-lined patty tins.
12. Bake for approximately 25 minutes or until firm to touch.
13. Cool and top with a little of the cooled glaze.

MAKES 6 CAKES



Little gluten-free chocolate cakes

EVALUATION

1 Describe the sensory properties of the little gluten-free chocolate cakes using descriptive language.
2 Suggest an alternative method for melting chocolate.
3 Why is it important to cream the butter and sugar until the mixture is very pale in colour and fluffy in texture?
4 How can you tell if the egg whites are beaten to 'soft peak' stage?
5 What is the purpose of the rice flour in this recipe?
6 Why is it important to fold in the egg white and flour with a spatula rather than using a wooden spoon?
7 How could you adapt this recipe to make it suitable for someone who was allergic to nuts?
8 List one safety rule to observe when preparing or baking the cakes.
9 Why is it important to heat the chocolate and cream for the glaze over a low heat only?
10 Suggest an alternative decoration that could be used for these cakes rather than topping with the chocolate glaze.

Fish in a paper bag and low-fat potato wedges

Low-fat meals can be simple to prepare and delicious to eat. The following recipe for fish in a paper bag with low-fat potato wedges is an example of a low-fat main course dish that is easy to prepare. There is only approximately 0.7 grams of fat in the fish fillet, and approximately 5 grams in the olive oil used to prepare the potato wedges. The fish and potato wedges could be served with a tossed green salad to make a tasty meal.

Low-fat potato wedges

200 grams waxy potatoes

extra light olive oil spray

1 tablespoon fresh rosemary leaves

seasoned salt

METHOD

1 Preheat oven to 200 °C. Cover a baking tray with baking paper.
2 Cut the potatoes into thick wedges and microwave on high for 2–3 minutes or until partially cooked through.
3 Add the oil and rosemary to the wedges and toss to coat.
4 Place the potato wedges on the oven tray in a single layer, and sprinkle with the seasoned salt.
5 Bake in the oven for approximately 15 minutes. Turn the potatoes over and bake for a further 15 minutes or until crisp and brown and cooked through.
6 Serve immediately with the fish in a paper bag.

Fish in a paper bag

1 thick fillet of white fish

¼ small carrot, cut into fine julienne strips

¼ stick celery, cut into fine julienne strips

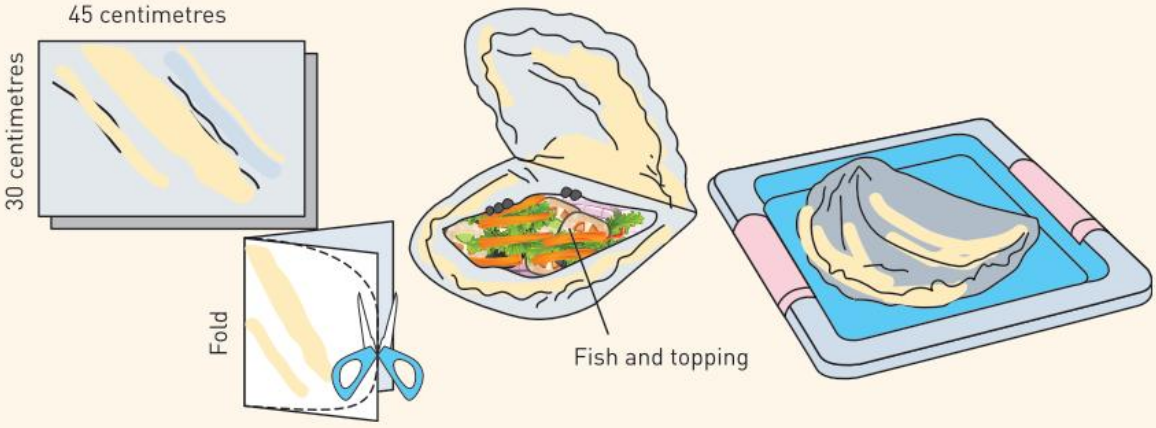
½ small spring onion, cut into fine julienne strips

melted butter

baking paper, 30 × 45 centimetres

POSSIBLE FLAVOURINGS

- dill
- coriander
- garlic
- soy sauce
- lemon rind and juice
- parsley
- ginger
- chilli
- lemon pepper



How to make the paper bag

METHOD

1 Preheat oven to 200 °C.
2 Prepare the fish parcel by folding the rectangle of baking paper in half, then cutting it into a large half-oval shape, leaving the folded side intact.
3 Open up the oval shape and brush the inside of the baking paper with melted butter and place on an oven tray.
4 Place the fish fillet on one half of the oval.
5 Top with julienned vegetables.
6 Select and add flavourings to taste.
7 Fold over the remaining half of the oval shape and fold the edges over twice to form a fine 'hem' to seal the parcel.
8 Bake for 10 minutes. During baking, the package will become puffed and golden.
9 The package can be placed on a plate and cut open for serving or removed from the package, plated and the juices poured over the fish.
10 Serve with low-fat potato wedges and tossed green salad.

SERVES 1



Fish in a paper bag

EVALUATION

1 Describe the sensory properties of the fish in a paper bag and low-fat potato wedges using descriptive language.
2 Why are the potatoes microwaved for 2 minutes before being baked?
3 Why are wedges lower in fat than oven-baked chips?
4 Why is it important to cut the vegetables into fine julienne strips?
5 What is the purpose of buttering the paper 'oval'? Why is it important to seal the paper well before cooking?
6 Why is cooking in the paper bag a healthier option than battered deep-fried fish?
7 Explain how heat is transferred in the oven to cook the fish and potato wedges.
8 Suggest some salad ingredients that could be served as an accompaniment to the fish.
9 From a nutritional perspective, explain why this is an excellent method of cooking fish.
10 Evaluate the nutritional properties of the fish in a paper bag with low-fat potato wedges by plotting the ingredients on a diagram of the Australian Guide to Healthy Eating. Comment on the nutritional value of the meal when served with a green salad.

Tofu and vegetable kebabs

Tofu is made from soy beans and is an excellent source of complete protein. Select a carbohydrate, such as rice or couscous, and a sauce to serve with the kebabs for a nutritious and tasty meal featuring soya bean products.

MARINADE

2 tablespoons tamari or soy sauce

2 teaspoons sesame oil

1 clove garlic, crushed

2-centimetre cube ginger, peeled and grated

1 tablespoon honey

KEBABS

250 grams firm tofu, cut into 2-centimetre cubes

1 small onion

½ red capsicum, deseeded and cut into 2-centimetre squares

½ yellow capsicum, deseeded and cut into 2-centimetre squares

1 zucchini, cut into 2-centimetre lengths

6 cherry tomatoes

3 button mushrooms, cut in half

1 tablespoon sesame seeds, toasted for garnish

6 wooden skewers, soaked in water for at least 2 hours

METHOD

1 Combine the marinade ingredients. Place the cubes of tofu in a single layer on a plate and pour the marinade over the top. Cover and refrigerate for 30 minutes. Turn the tofu cubes once while marinating.

2 Parboil the onion for 5 minutes. Drain and cut the onion in half and then separate it into leaves.

3 Thread the marinated tofu and vegetables onto the skewers.

4 Preheat the griller, char-grill or barbecue to high. Cook the kebabs for 10–12 minutes, basting and turning carefully during the cooking process.

5 Serve the tofu and vegetable kebabs with rice or couscous and a satay or peanut sauce, a coconut curry sauce or a yoghurt sauce. Garnish with toasted sesame seeds.

SERVES 2



Tofu and vegetable kebabs

EVALUATION

1 Describe the sensory properties of the tofu and vegetable kebabs using descriptive language.
2 Why are the ingredients, particularly the tofu, marinated before being placed on the skewers?
3 Why are the skewers soaked in water before being used?
4 How does parboiling the onion improve the eating properties of this vegetable?
5 What are the benefits of cooking kebabs at a high temperature?
6 Why is basting recommend during the cooking process?
7 Suggest why sauces are often served as an accompaniment to kebabs.
8 Suggest some ingredients other than sesame seeds that could be used to garnish this dish creatively.
9 If you were to make this dish again, what modifications to the processes would you make?
10 Evaluate the nutritional properties of the tofu and vegetable kebabs by plotting the ingredients on a diagram of the Australian Guide to Healthy Eating.

Savoury soufflé with vibrant vegetable salad

The preparation of a hot soufflé is a great example of the way in which beaten egg whites are able to incorporate a large volume of air and enable aeration to occur. The hot soufflé also demonstrates the changes that take place in the physical and sensory properties of eggs when they are denatured by both mechanical means and by heat. The savoury soufflé and the vibrant vegetable salad incorporate a wide range of sensory properties to create a tasty light meal.

Savoury soufflé

20 grams butter

1 tablespoon plain flour

¾ cup milk

⅓ cup grated Swiss cheese

salt, pepper

2 tablespoons grated parmesan cheese

1 tablespoon chives, chopped

2 eggs, separated

METHOD

1. Melt the butter in a saucepan, and then stir in the flour with a wooden spoon and cook for 1 minute.
2. Remove from the heat and gradually stir in the milk.
3. Return to the heat and stir continuously until the sauce thickens.
4. Add the grated Swiss cheese and stir over the heat until it melts. Season with salt and pepper.
5. Transfer to a clean bowl and put to one side. Allow to cool, beating occasionally to prevent a skin forming.
6. Preheat oven to 180 °C and grease two soufflé dishes approximately 1½ cups in volume. Allow to set and grease again.
7. Add the parmesan cheese and chopped chives to the cheese sauce and mix well.
8. Add the egg yolks to the cheese mixture one at a time and beat in well.
9. Beat the egg whites in a clean, dry bowl until they form stiff peaks.
10. Fold 2 tablespoons of beaten egg whites into the cheese mixture and stir until the mixture loosens up.
11. Fold the remaining beaten egg whites into the cheese mixture.
12. Pile the mixture into the middle of the prepared soufflé dishes. Fill to the top then level off with a metal spatula.
13. Place on a baking tray and bake for 20–25 minutes until well risen and firm in the centre when pressed with the fingertips.
14. Serve immediately.

Note: prior to baking, run your finger round the inside edge of the soufflé dish. This will help the soufflés rise up straight with a neat edge.

SERVES 2



Savoury soufflé

Vibrant vegetable salad

DRESSING

¼ cup olive oil

2 tablespoons lemon juice

1 tablespoon clear honey

SALAD

1 tablespoon pine nuts

¼ red capsicum

¼ green capsicum

1 stick celery

½ small carrot

¼ cup bean shoots

METHOD

1 Place the olive oil, lemon juice and honey in a screw-top jar, and shake vigorously to combine the ingredients.

2 Toss the pine nuts in a frying pan over medium heat until they are a golden brown. Cool and reserve.

3 Deseed and cut the capsicum into julienne strips about 5 centimetres long.

4 Remove any strings from the celery and cut into julienne strips about 5 centimetres long.

5 Peel the carrot and cut into julienne strips about 5 centimetres long.

6 Place the prepared vegetables in a bowl and toss through the bean shoots.

7 Toss lightly with the shaken dressing just before serving and sprinkle with the toasted pine nuts.

SERVES 2



Vibrant vegetable salad

EVALUATION

1 Describe the sensory properties of the savoury soufflé and vibrant vegetable salad using descriptive language.

2 What is the term for the mixture of butter and flour used for thickening the sauce used as the base of the soufflé?

3 Describe ways of optimising the properties of egg whites when beating.

4 What effect do the beaten egg whites have on the soufflé when baked?

5 Explain how the different vegetable colours have an impact on the sensory qualities of the salad.

6 Describe the effect that the bean shoots and pine nuts have on the texture of the salad.

7 Why is it important to shake the dressing ingredients together vigorously before serving?

8 Why is the dressing added just prior to serving?

9 Write a short description of these dishes that would be suitable to include in a menu to tempt diners to order it.

10 Evaluate the nutritional properties of the savoury soufflé and vibrant vegetable salad by plotting the ingredients on a diagram of the Australian Guide to Healthy Eating.

RECIPE INDEX

A

almonds
  Apricot and almond tartlets 298–9
  Apricot and almond tartlets 298–9
apples
  Filo apple and dried fruit fingers 260–1

B

bacon
  Potato and bacon pancake stacks 274–5
  Sweet corn and bacon quiche 284–5
bean shoots, Vibrant vegetable salad 363
beef
  Beef stroganoff 219–20
  Cheesy schnitzels 352–3
  Ragoût 326–7
biscuits
  Coconut macaroons 320
  Double chocolate biscuits 340–1
  Lemon myrtle biscuits 294–5
  Macadamia shortbread 292–3
  Oaty choc-chip biscuits 281
Bok choy salad 264, 265
bread
  Crusty mixed seed loaf 262–3
  Focaccia 308
  Grissini 310–11
  Pita bread 309
  Sweet potato parathas 334–5
broccoli, Feta, broccoli and carrot pie 306–7
buns, Hot cross buns 276–7
Bush chips 288

C

cabbage
  Coleslaw 354–5
  Minestrone soup 348–9
cakes
  Little gluten-free chocolate cakes 356–7
  Mini orange syrup cakes 300–1
  Raspberry and yoghurt cake 344–5
capsicum
  Chicken and chilli noodle stir-fry 193–4
  Coleslaw 354–5
  Kangaroo chilli con carne 288–9
  Mango and capsicum salsa 350–1
  Meatball and tomato soup 336–7
  Pork and soba noodle stir-fry 302–3
  Tofu and vegetable kebabs 360–1
  Vibrant vegetable salad 362
Caramelised onion tarts 332–3
carrots
  Carrot dip 312–3
  Chicken and chilli noodle stir-fry 193–4
  Coleslaw 354–5
  Couscous 342
  Feta, broccoli and carrot pie 306–7
  Lamb and lentil soup 325
  Minestrone soup 348–9
  Pork and soba noodle stir-fry 302–3
  Quinoa, brown rice and roasted carrot salad 268–9
  Ragoût 326–7
  Vegetable fritters 296–7
  Vibrant vegetable salad 362
celery
  Coleslaw 354–5
  Couscous 342
  Lamb and lentil soup 325
  Minestrone soup 348–9
  Ragoût 326–7
Cheesy schnitzels with pressed parmesan potatoes 352–3
chicken
  Chicken and chilli noodle stir-fry 193–4
  Chicken with sundried tomato marinade served on couscous 342–3
  Lemon chicken bites 338–9
  Meatball and tomato soup 336–7
  Mediterranean risotto 318–9
  Mini chicken and corn patties 264, 265
  Quinoa crumbed chicken tenderloins 270–1
  Savoury chicken parcels with mango and capsicum salsa 350–1
chickpeas, Carrot dip 312–3
chilli
  Chicken and chilli noodle stir-fry 193–4
  Kangaroo chilli con carne 288–9
chocolate
  Chocolate filling 340
  Chocolate fudge 52
  Chocolate glaze 356
  Chocolate and wattleseed self-saucing pudding 290–1
  Double chocolate biscuits 340–1
  Little gluten-free chocolate cakes 356–7
  Oaty choc-chip biscuits 281
chutneys, Quick mango chutney 328
Coconut macaroons 320
Coffee meringue roulade 322–3
Coleslaw 354–5
corn
  Mini chicken and corn patties 264, 265
  Sweet corn and bacon quiche 284–5
  Vegetable fritters 296–7
couscous 342
Crusty mixed seed loaf 262–3
cucumbers
  Soba noodle salad 318–19
curries
  Ricotta curry 282–3
custard filling 286

D

Double chocolate biscuits 344–5
dips
  Carrot dip 312
  White bean dip 312
dressings 264, 268, 318, 334, 342, 369
dried fruit
  Filo apple and dried fruit fingers 260–1
  Hot cross buns 276–7

E

egg noodles
  Chicken and chilli noodle stir-fry 193–4

F

Feta, broccoli and carrot pie 306–7
Filo apple and dried fruit fingers 260–1

fish
Fish in a paper bag and low-fat potato wedges 358–9
Indian-style fish cakes with quick mango chutney 328–9
Vietnamese-style fish cakes 330–1
Focaccia 308
Freekah and tomato salad 24
Fruit tartlets 286–7

G

Garlic toast 324
glazes 287, 386
Bun glaze 276
Chocolate glaze 356
gnocchi, Semolina gnocchi with roasted tomato sauce 304–5
green beans, Minestrone soup 348–9
Grissini 310–11

H

Hot cross buns 276–7

I

Indian-style fish cakes with quick mango chutney 328–9

K

Kangaroo chilli con carne with bush chips 288–9

L

lamb
Lamb and lentil soup 325
Spiced lamb with garlic toast 324
Lemon chicken bites 338–9
Lemon macaroon filling 294
Lemon myrtle biscuits 294–5
lentils
Lamb and lentil soup 325
Quinoa burgers 272–3
Little gluten-free chocolate cakes 356–7
Low-fat potato wedges 358–9

M

Macadamia shortbread 292–3
mangoes
Mango and capsicum salsa 350–1
Quick mango chutney 328
marinades 302, 326, 366
Sundried tomato marinade 342
Meatball and tomato soup 336–7
Mediterranean risotto 318–9
meringues
Coffee meringue roulade 322–3
Vegan meringues 250–1
Minestrone soup 348–9
Mini chicken and corn patties 264, 265
Mini orange syrup cakes 300–1
Miso soup 34–5
mushrooms
Beef stroganoff 219–20
Tofu and vegetable kebabs 360–1

N

noodles *see* egg noodles; soba noodles; udon noodles
nuts
Macadamia shortbread 292–3
Nutty sweet potato soup 314–5
Oaty choc-chip biscuits 281
Praline 323
Spiced rice 278–9

O

Oaty choc-chip biscuits 280–1
Old-fashioned cream scones 350–1
olives
Mediterranean risotto 318–9
onions
Caramelised onion tarts 332–3
oranges
Mini orange syrup cakes 300–1

P

pancakes, Potato and bacon pancake stacks 274–5
pasta, Poppy seed pasta 354
pastry
Apricot and almond tartlets 298–9
Biscuit pastry 294
Caramelised onion tarts 332–3
Feta, broccoli and carrot pie 306–7
Filo apple and dried fruit fingers 260–1
Fruit tartlets 286–7
Lemon myrtle biscuits 294–5
Roasted tomato tarts 332–3
Savoury chicken parcels 350–1
Shortcrust pastry 284
Sweet corn and bacon quiche 284–5
Pear and parmesan salad with lemon chicken bites 338–9
pine nuts
Feta, broccoli and carrot pie 306–7
Mediterranean risotto 318–9
Vibrant vegetable salad 362
Pita bread 309
Poppy seed pasta 354
pork
Meatball and tomato soup 336–7
Pork and soba noodle stir-fry 302–3
potatoes
Low-fat potato wedges 358–9
Minestrone soup 348–9
Potato and bacon pancake stacks 274–5
Potato and spinach quesadillas 266–7
Pressed parmesan potatoes 352
Ricotta curry 282–3
Praline 321
Pressed parmesan potatoes 352

Q

quesadillas
Potato and spinach quesadillas 266–7
Quick mango chutney 328
quinoa
Quinoa, brown rice and roasted carrot salad 268–9
Quinoa burgers 272–3
Quinoa crumbed chicken tenderloins 270–1

R

Ragoût 330–1
Raspberry and yoghurt cake 344–5
red kidney beans
Kangaroo chilli con carne 288–9
rice
absorption method 278, 280
Mediterranean risotto 318–9
microwave method 278
Quinoa, brown rice and roasted carrot salad 268–9
rapid boil method 381
rice cooker method 278, 280
Spiced rice 278–9

Ricotta curry 282–3
Roasted tomato sauce 304
Roasted tomato tarts 332–3

S

salads
  Bok choy salad 264, 265
  Freekah and tomato salad 24
  Pear and parmesan salad 342–3
  Quinoa, brown rice and roasted carrot salad 268–9
  Soba noodle salad 318–19
  Vibrant vegetable salad 362
sauces 290
  Yoghurt sauce 296
Savoury chicken parcels with mango and capsicum salsa 350–1
Savoury soufflé with vibrant vegetable salad 362
scones
  Old-fashioned cream scones 350–1
Semolina gnocchi with roasted tomato sauce 304–5
snow peas
  Pork and soba noodle stir-fry 302–3
  Soba noodle salad 318–19
soba noodles
  Pork and soba noodle stir-fry 302–3
  Soba noodle salad 318–19
soups
  Lamb and lentil soup 325
  Meatball and tomato soup 336–7
  Minestrone soup 348–9
  Miso soup 34–5
  Nutty sweet potato soup 314–5
Spiced lamb with garlic toast 324
Spiced rice 278–9
spinach
  Potato and spinach quesadillas 266–7
stir-fry
  Chicken and chilli noodle stir-fry 193–4
  Pork and soba noodle stir-fry 302–3
Sundried tomato marinade 342
Sweet corn and bacon quiche 284–5
sweet potatoes
  Nutty sweet potato soup 314–5
  Ricotta curry 282–3
  Sweet potato parathas 334–5
syrup, Orange syrup 300

T

tofu
  Miso soup 34–5
  Tofu and vegetable kebabs 360–1
tomatoes
  Freekah and tomato salad 24
  Kangaroo chilli con carne 288–9
  Meatball and tomato soup 340–1
  Mediterranean risotto 318–9
  Minestrone soup 348–9
  Ragoût 326–7
  Roasted tomato sauce 304
  Roasted tomato tarts 332–3
  Sundried tomato marinade 342
  Tofu and vegetable kebabs 360–1

U

udon noodles, Miso soup 34–5

V

Vegan meringues 250
Vegetable fritters with yoghurt sauce 296–7
Vibrant vegetable salad 362
Vietnamese-style fish cakes 330–1

W

Wattleseed pudding 290–1
white cannellini beans
  Quinoa burgers 272–3
  White bean dip 314–15

Y

yoghurt
  Raspberry and yoghurt cake 344–5
  Yoghurt sauce 296

Z

zucchini
  Tofu and vegetable kebabs 360–1
  Vegetable fritters 296–7

INDEX

A

A1 Bakery 23
AA British Retail Certification (BRC) rating 159
access to ingredients 227–30
activity levels, and food choices 243
'added sugar' products 121
adolescents
  calcium and exercise needs 247
  healthy eating patterns 242
Afghan cuisine 107
agricultural chemicals 56–7
agricultural crops, global spread of 42–3
  grains 43–5
  spices, sugar and chocolate 48–52
  tea and coffee 46–8
agricultural development 10–11
  factors that facilitated 11–13
  foods available to early communities 13–14
agricultural food systems, early development 9–10
agricultural industries
  development in Australia 88–92
  economic trends 137–9
agricultural land, foreign ownership 139
agricultural revolution 56
agricultural sectors 143
agriculture 88
Aldi supermarket chain 140
Alexander, Stephanie, *The Cook's Companion* 126–7
allergen ingredients 159
almuerzo 38
the Americas 35
  food production and food culture 35–6
  see also Peru
ammonia 57
analysing food products 211
  qualitative analysis 213
  quantitative analysis 211
ancient grains 37–8, 164
angelica 9
animal welfare 146, 166, 167, 169
Anzac biscuits 129–30
appearance (food) 206
aquaculture production 147
aroma 204, 206, 208
Australia
  food subcultures 123–5
  food trends driven by changing social behaviours 118–22
Australia New Zealand Food Standards Code 159, 187, 188–9
  Chapter 1: General food standards 188–9
  Chapter 2: Food product standards 189
  Chapter 3: Food safety standards 189
  Chapter 4: Primary production standards 189
  food labelling 190–1
Australian cheddar cheese, triangle test 212–13
Australian chefs 25–8, 257
  collaboration with 162
Australian cuisine 129–30
  contemporary use of 'bush foods' 130–1
  fusion food 131–2, 249
  influence of Australian chefs and recipe books 125–8
  migration impact on development of 102–14
Australian Dietary Guidelines 225
  Dietary Guideline 2 225, 226
Australian farms and fisheries, economic trends 137–9
Australian food icons 129–30
Australian food industry
  economic opportunities provided by 164
  economic trends, issues and influences 137–42
  trends and issues to 2050 137
Australian Guide to Healthy Eating 224, 225
Australian International Foods 157
  about the company 157
  ethical and environmental responsibility 163–4
  factors that have contributed to the success of the company 158–64
  flexibility in factory operations 162
  food safety and quality assurance 158–9
  innovation and creativity 161–2
  international markets 158
  meal components 158
  private label products 158
  product development 162–3
  products produced 157–8
  proprietary products 157
  strategic planning 160–1
Australian recipe books 125–8
Australian retail food and beverage sales, trends and issues 139–41
Australian Wheat Board 89
Australian Women's Weekly cookbook series 126
avgolemono 112, 114
Aztecs 50, 51

B

backyard vegetable gardens 228
bacon 91
bacteria 62
bags and baskets 76–7, 78
baklava 110
barbecue 129
beans 13
beef-cattle industry, development, Australia 90–1
beef production, Australia 144–5
beef stroganoff, comparison between homemade and commercial 216–18
bento boxes 35
'best-before' date 190, 234, 237, 238
biosecurity protocols 148–9
biotechnology 149
boomerangs 78
border protection 187
bowel cancer 246
breakfast club 121
British East India Company 46, 48
Buddhism 30, 33–4, 249
bush foods (bush tucker) 71–3
  contemporary use 130–1
bush spices 73–4
  taste-testing 74
butter blends 99
butter making 90, 97, 146

C

cacao beans 13, 50, 51
cage-free eggs campaigns 166, 167–8
calcium, increasing in our diet 247–8
cancers 244, 246
canning industry 97
canoes 76
canola production 138, 144

Cantonese cooking 102, 103
cardiovascular disease 242, 244
casein 147
Catholicism 27, 37, 249
cattle feedlots 91
cattle industry, Australia 90–1
celebrity chefs 127–8
cena 38
chalau 107
changing social behaviour, as driver of food trends 118–22
charred foods 123
cheese making 63, 90, 147
chef's recipes 128–9
chemical analysis 213
chicken-meat industry, development, Australia 91–2
chicken-meat production, Australia 145
children
  fresh chilled products for 162
  healthy eating patterns 242
China, tea drinking 46
chinampas 12
Chinese cafes 103
Chinese immigrants 102–3
Chinese market gardens 93–4, 102–3
Chinese-style cooking 102
chocolate 50–1
  growth in trade 51
Choice (consumer-rights organisation) 168
  free-range bacon, ham, pork and turkey 169
  free-range egg campaign 168
  Health Star Rating 169
  palm oil labelling 169
Chong, Elizabeth 126
Christians 19, 22, 27, 37, 249
Christmas, Greek 114
churros 28
citrus fruit production 92–3
'clean green food', demand for 142
climate change 10, 149
coal seam gas 149, 150
Coca-Cola Company 66
coffee 46–7
  growth in trade 48
  taste testing 47
coffee culture 121
cold-chain technologies 65
colorectal cancer 244, 246
colour (of food) 212
Columbian Exchange 43
Columbus, Christopher 42, 43, 49, 51
combine harvester 89
commercial meal and food products, comparison with homemade meals 217–219
communal dining 118
communication technologies 66
comparison screening 179
concern for the environment 119
conducting, sensory analysis tests 206–209
considerations (design brief) 177
constraints (design brief) 177
consumer awareness campaigns 167–9
  evaluating 170
consumer concern for the environment 119–20
consumer demand 137
  influence on Australia's food supply 165–9
consumer rights organisations 167–9
consumer trend to discount supermarket shopping 139–40
contemporary foods 122
convenience foods 118–19
convict transportation 102
Cookery the Australian Way 125
cooking 226
cooking methods, Indigenous Australians 80
cooks 253
  avoiding problems 253
  be social and get feedback 254
  benefits of being a good cook 254
  characteristics of people who cook 253
  how to be a successful cook 253–4
  what type of cook are you? 253
  see also home cooks
coolamons 78
corn 13, 43, 57
corn products, taste-testing 14–15
costing a recipe 235–6
cottage cheese, homemade versus commercial 64
creative research (innovative ideas stage) 177, 178
critical control points (CCPs) 159, 193
  identifying in food processing 193–4
crop rotation 89
cuisine 18, 104, 107
  see also Australian cuisine; food cultures and cuisine around the world; Greek cuisine
cultivation of plants 10
cultural heritage, and food choices 249
culture 18
curries 30

D

da Gama, Vasco 42, 43, 49
dairy allergies 251
dairy cooperatives 90, 98–9, 154–5
dairy industry
  in Australia 146–7
  development, Australia 90
  technological developments 61–3
dairy products 146–7
decline stage (product life cycle) 174
Delicious 226
Department of Agriculture and Water Resources (Cwlth) 187
  border protection and quarantine 187–8
  imported food inspection 187
Department of Health and Human Services (DHHS) (State)
  food product recalls 199
  food safety programs 196
  responding to a food poisoning incident 197–8
desayuno 38
describing food 208
design brief 175
  components 176
  meal in a moment 233
  specifications – constraints and considerations 177
detector dogs 187–8
developing new and innovative product ideas 177
  evaluating and screening ideas 178
  innovative ideas stage 177–8
Devondale Murray Goulburn 98–9, 154
diet-related diseases 244
Dietary Guideline 2 225, 226
difference tests 211, 212–13
digging sticks 76
dips 110, 113
direct research (innovative ideas stage) 177, 178
discount supermarket shopping, consumer trend to 139–40

discussion web 132
domestication of animals 3, 9, 10, 11
drinking chocolate 52
Dutch East India Company 43, 46, 48, 49

E

e-shopping for food 121–2, 229
East Asia and Oceania
  food production and food culture 31
  see also Japan
Easter, Greek 113
economic considerations in meal preparation 234
economic opportunities provided by food industry 164
economic trends
  Australian farms and fisheries 137–9
  Australian food industry 137–42
economic viability (new product), evaluation 182
eel-farming systems 79
egg allergies 251
egg production, Australia 145, 166–8
einkorn wheat 14, 44
emmer wheat 14, 44
emotions 206
environmental sustainability 119, 123, 163–4
environmentally conscious cooks 236–8
equipment for the kitchen 231
ethical food production 163, 166–8
ethical food restrictions 248–9
Ethiopia
  geography and climate 19
  meal structure 19
  regional influences on food production 19–20
  religion 19
  traditional foods 19–20, 108
ethnic foods 132
Eurasia 28
  food production and food culture 28–9
  see also India
European immigrants, post-World War II 103–4
evaluating and screening ideas 178
evaluation criteria (product development) 177
evaluation of a new food product 181–3
exports 141–2, 143, 144, 145, 146, 147, 154, 156, 157, 158

F

Facebook 121
facial hedonic descriptors 214
farmers' markets 228–9
farming, non-Indigenous settlers 83–4
farming implements and machinery, development 57–8
farming tools, development 12–13
fat, reducing in our diet 244
feedlots 91
Fertile Crescent 20, 40, 44
  food production and food culture 20–1
  see also Lebanon
fertilisers 57, 89
feta 110, 114
  taste-testing 109
fibre, increasing in our diet 246–7
filo pastry 110
finger limes 131
fire drills 76
firestick farming 81
First Fleet 82, 84, 90, 102
first settlers *see* non-Indigenous settlers
first-stage screening 178
fish 30, 112
fish farming 147
fish traps 76, 77, 79
fisheries production in Australia 138, 147
fishing 8, 9, 77
five food groups 225
flavour (food) 206–7, 208
flavour houses 160
flavourings
  Greek food 112–13
  Indigenous Australians 73–4
flour mills 60
Fong Tong, Alfred, market gardener 94
Fonterra 155
Food Act 1984 (Vic) 195
food additives 164, 191
  in snack foods 192
food allergies 251–2
  substitution ingredients 251, 252
food availability, globalisation impact on 64–7
food budget, making it go further 233–4
food choices
  factors that influence 225–32
  managing to meet specific dietary needs 242–52
food commodities, trade in 42–3, 44–5, 46, 48–9, 50, 51, 53
food cultures and cuisine around the world 18, 249
  the Americas 35–6
  East Asia and Oceania 31
  Ethiopia 19–20
  Eurasia 28–9
  Fertile Crescent 20–1
  India 29–30
  Japan 31–4
  Lebanon 21–3
  Mediterranean 26
  Peru 36–8
  Sub-Saharan Africa 18
food distribution, Indigenous Australians 80
food exports 141–2, 143, 144, 145, 146, 147, 156, 157, 158
food imports 142
food industry safety programs 196–202
food intolerances 251–2
food labelling 169, 190–1
  food that must not appear on a food label 191
  information that may appear on a label 191
  information that must appear on a label 190
food labels, nutrient content information 211
food legislation 186, 195
Food Lover's Guide 226
food magazines 226
food manufacturers 154
  in Australia 154–9
'food miles' 124
food packaging considerations 179–80
food poisoning incident, system for responding to 197–8
food preparation
  magazines 226
  skills and knowledge 226–7
  television programs 127, 226, 254
  tools of Indigenous Australians 78

food processing 97
  in Australia 154
  definition 154
  identifying critical control points 193–4
  technological development 60–3
food processing industries
  development in Australia 97–9
  leaders in Australia 154–9
food product development 174, 175–83
food product recall system 159, 198–200
  example of advertisement 201
  lettuce recall 202
food product standards 189
food production developments, Australia 86–7
food retailers, influence on food choice 164–5
food safety and quality assurance 158–9
food safety legislation 195
  implementation and enforcing in Victoria 195–6
food safety programs 196–7
food safety regulation in Australia 186
  local authorities 186, 195–6
  national authorities 186–94
  state authorities 186, 195
food safety standards 189, 192
  based on principles of HACCP 192–4
food security 148–50
food sensitivity 164
food service sector 154
  influence on food choice 164, 165
food skills, developing 253–4
Food Standards Australia New Zealand (FSANZ) 142, 158, 159, 187, 188
  administration of Food Standards Code 188–9
  food additives 191
  food product recall 199–200
  food safety programs 196
  goals 188
  responding to a food poisoning incident 197
  roles and responsibilities 187
Food Standards Code *see* Australia New Zealand Food Standards Code
food storage 188
food subcultures in contemporary Australia 123–4
food supply, influence of consumer demand on 165–9
food supply chain 65
food trends 160–1
  driven by changing social behaviours 118–22
food trucks 119
food waste
  annual cost of 222
  facts about 222–3
  minimisation 236–7
  minimisation at home 238
  reasons for at home 237
  reducing within your school community 239
'foodies' 118
foreign ownership of agricultural land 139
4Ps of marketing 180–1
'free from' trend 120
free-range eggs
  campaigns 168
  Subway use in its restaurants 166
free-range pork 169
free settlers 102
free trade agreements 141–2
freeganism movement 124
freekah 23, 24
Fresh 226
fresh chilled products for children 162
fresh milk 146
'freshness' as on-trend 215
fruit
  buying 238
  as food waste 237
  Greek meals 112
fruit canning 97
fruit crops 147–8
fruit trees 13
Fulton, Margaret 126
functional foods 120
fusion food 131–2, 249

G

gazpacho 28
general food standards 188–9
General Mills 155
Generation Y consumers 118
genetically modified crops 138, 149
George Weston Foods 155
global demand, increasing 137
global food and beverage trends 141
globalisation 64
  impact on food availability 64–7
gluten-free products 120
GM canola 138
GM wheat 149
goat-meat production 145
gold rush 102
Golden Circle 97
'good-for-you' ingredients 120
Good Manufacturing Practice (GMP) 259
Good Taste 226
Goodman Fielder 155
Gourmet Traveller 226
grain industry, technological developments 60
grains
  development of 43–5
  growth of trade 44–5
  see also corn; rice; wheat
Grand Exchange 43
Granger, Bill 127
grapes 147
The Great Australian Bake Off 254
Greece, geography and climate 109
Greek community
  in Australia 108
  customs and celebrations 113–14
Greek cuisine
  preparation and serving methods 113
  regional influences on 109–10
  typical ingredients 110–13
  typical meals 113
Greek immigrants, influence on Australian cuisine 108–14
Greek yoghurt 110
Green Revolution 57
Green's Foods 155
groundwater 150
growth stage (product life cycle) 174
gyozas 34

H

HACCP system 158–9, 179, 182, 189, 192
  preventing food spoilage and poisoning using 192
  steps in 193
halal meat 22
ham 91
hand-milking 61
harvesting machinery 58, 89
Hay, Donna 127
Hazard Analysis Critical Control Points systems *see* HACCP system
headers 57
health and wellbeing 120–1, 225–6
  and food choice 244–8
Health Star Rating of products 169

healthy eating patterns, and life span stage 242–3
hedonic descriptors 212
herb gardens 228
herringbone dairy 61
high-fibre diets 246
high-yield seed varieties 57, 89
Hinduism 30, 249
home cooks, opportunities and pathways 254–6
home-delivered meal kits 119
homemade meals, comparison with commercial meal and food products 215–18
honey ants 73
horticultural industries, development in Australia 92–4, 96
horticultural production, in Australia 147–8
horticulture 88
hunter-gatherer societies 4
  challenges 5
  Indigenous Australians 70
  Mbuti Pygmies 2, 5–7
  Sami people 2, 7–9
  sedentary 9–10, 11
  types of food available 4–5
hunting 6, 9, 71, 75, 77, 78

I

Imported Food Inspection Scheme 187
imports 142
in-store food magazines 226
Incas 36
increasing calcium in the diet 247
increasing fibre in the diet 246–7
India
  geography and climate 30
  meal structure 30
  regional influences on food production 29–30
  religion 29
  traditional foods 30
Indigenous Australians 70
  cooking methods 80
  finding water 82
  flavourings 73–4
  food distribution 80
  foods from animal sources 71–2
  foods from plant sources 71, 72–3
  human resources 75
  as hunter-gatherers 70
  land-management practices 70–1, 81
  lifestyle 70–1
  men's and women's roles 75
  natural resources used 76–7
  and non-Indigenous settlers 84
  specialist knowledge and practices 80–2
  tools and technology used 76, 77–9
Indigenous foods 71–3
industrialisation 56
Inghams Enterprises 155
ingredients, access to 227–30
innovative ideas stage 177–8
insoluble fibre 246
Instagram 118, 121, 255
international cuisine 104
introductory stage (product life cycle) 174
irrigation systems
  Australia 92
  development 11, 12, 58–9
Islam 19, 22, 27, 249
Italian cafes and food stores 104

J

Jainism 30
jam-making 97
jamón serrano (ham) 28
Japan 31
  geography and climate 33
  meal structure 35
  regional influences on food production 31–3
  religion 33–4
  tea drinking 46
  traditional foods 34
JBS Australia 156
Jewish community 249
Judaism 19

K

Kakadu plum 72, 73
kangaroo (meat)/kangaroos 71, 78, 80, 102, 130
Kellogg's 66
Kez's Kitchen 255–6
kitchen equipment 231, 232
knives 231
knowledge of nutrition and health 225–6
Korea 33
koulourakia 113
Kraft 98

L

lamb 22, 102, 112
lamb production 91
lamingtons 130
land-management practices, Indigenous Australians 70–1, 81
large-scale cropping 143–4
lean meats 2–8
Lebanese bakeries 23
Lebanon 21
  geography and climate 21
  meal structure 22
  regional influences on food production 21–3
  religion 22
  traditional foods 22–3
lemon myrtle 74
lemons 112
lettuce recall 202
Lidl supermarket chain 140
life cycle of a product 174
life span age, and healthy eating patterns 242
line extension products 174
livestock industry, Australia 144–6
local authorities responsible for monitoring food businesses 186, 195–6
locally sourced produce 120, 124
location, and access to ingredients 227–8
locavores 124
loukomades 113, 114
lunch boxes 242

M

maamoul 22
macadamia nuts 73
McCain 156
McDonald's 67, 243
maize *see* corn
mandatory warning statements (labels) 190
Margaret Fulton Cookbook 126
market gardens 93–4
market research (new products) 175
marketing campaign (new products) 180–1
  evaluation 182–3
MasterChef 127, 226, 254
masticha 112–13
maturity stage (product life cycle) 174
Mayan farmers 12, 13, 50

Mbuti Pygmies 2, 5
  food gathering 6–7
  lifestyle 5–6
'me-too' products 174
meal planning decisions
  calculating quantities of food 234–5
  costing a recipe 234
  factors that influence 249–50
  making the budget go further 233–4
meal preparation
  kitchen equipment 231
  physiological, social and economic considerations 217
  production plan 232
  time management 231–2
meal solutions 217
meat canning 97
meat industry, development, Australia 90–2
meat pies 130
meat processors 156
media, and consumer demand 165–6
medicine – food and health 120–1
The Mediterranean 26
  food production and food culture 26
  see also Spain
Melbourne Olympic Games (1956) 104
membrane technology (milk processing) 62
menopause 247
menu planning 238
meringue comparison – vegan and traditional 250
Mesoamerica
  agricultural development 11, 12, 13–14
  crops from 43, 50
Mesopotamia, agricultural development 10–11, 12, 13, 58
mezze 111, 113
migration
  impact on Australian cuisine 102–14
  patterns of, to Australia 100–1, 102–8
Mildura Fruit Preserving Company 97
milk pipeline system 61
milk powders 147
milk preservation 62
milk-processing industry 97–9, 154–5
milk-processing technology 62
Millennials 118
milling 60
mixed farming 89
monopsony 89
mountain pepper 73–4
moussaka 112
mouthfeel 208
multinational corporations 66–7
municipal councils
  food product recalls 200
  food safety programs 197
  food safety role 186, 195–6
  responding to a food poisoning incident 198
Muslims 19, 22, 249
My Kitchen Rules 226, 254

N

national authorities responsible for food standards 186–94
natural sugars 121
Nestlé 66
nets 76–7
new food product development 174, 175–83
Nguyen, Luke 106
nitrogen 56, 89
nitrogen-fixing bacteria 56
noise (food) 210
non-Indigenous settlers
  challenges of establishing a sustainable food supply 82–4
  lack of agricultural experience 83
  lack of suitable water supply 84
  limited arable land near coastal areas 83–4
  poor communication with the Indigenous community 84
  problems of different land and climatic conditions 83
  suitability of crops and equipment bought by First Fleet 84
  unwillingness to adapt to the local environment 84
noodles 34, 35
nuoc cham 105
nut allergies 251
nut crops 148
nutrient content information on food labels 213
nutrient-modified milks 62
nutrition knowledge 225–6

O

obesity 120, 244
Oceania, food production and food culture 31
oestrogen 247
olfactory cells in the nose 206
olive oil 27, 111, 112
olives 110–11
  taste-testing 111
omega-3 fatty acids 246
on-trend ingredients and foods 123
online food shopping 121–2, 229
orange juice and drink varieties, analysing 95–6
organic food production, Australia 138–9
organic food system 123
organoleptic properties of food 204–8, 213
osteoporosis 247

P

packaging and labelling (new products) 179–80, 183
paella 27
palm oil 164
  labelling 169
Papua New Guinea 31
pasteurisation 62
pavlova 129
perishable goods, transport technology improvements 65–6
Perry, Neil 127
personal tastes and preferences, and food choices 243–4
Peru 36
  geography and climate 36–7
  meal structure 38
  regional influences on food production 36
  religion 37
  traditional foods 37–8
pesticides 89
Phillip, Captain Arthur 82, 84
physiological considerations in meal preparation 217
pig industry, development, Australia 91
pilot factory 179
pitfall traps 9
pizza restaurants 104
place 180, 181

planning to shop for family meals 233
  calculating quantities of food 234–5
  costing a recipe 235–6
  making the food budget go further 233–4
plough, invention of the 57
population growth 137
pork 91, 169
pork production, Australia 145, 169
potatoes 37
poultry production, Australia 145, 155, 169
preference tests 214
prepared, ready to cook meals 162
price 180, 181
primary food production
  in Australia 143–8
  technological development 56–60
primary production standards 189
private label products 140, 141, 158, 159, 163, 169
product 180, 181
product development 162–3
  for private labels 163
  types of 174
product development process 174, 175–83
product evaluation 182
product launch 180–1
product life cycle 174
product packaging 179–80, 183
production line efficiency 179
production plan (meal preparation) 232
production process, evaluation 182
production trials 179
profiling test 211, 213
promotion 180, 181
proprietary products 157
protecting Australia's food supply 148–9
prototypes and product testing 178–9

Q

qualitative analysis 213
Quality Assurance and Food Safety staff 159
quantitative analysis 211
quantities of food, calculating 234–5
quarantine 149, 187–8
quinoa 37–8

R

Ramadan 22
ready-to-eat meals 217
reapers 58, 88
recipe cards 232
reducing fat in our diet 244
refrigerated and container transport 65
refugee resettlement in Australia 107–8
reindeer 8, 9
religious food restrictions 249
rennet 63
resources (meal planning) 225–33
  access to ingredients 227–30
  availability and use of 231–3
  food preparation skills and knowledge 226–7
  nutrition and health knowledge 225–6
  shopping for food 233–6, 238
reverse osmosis 62
rice 27, 30, 33, 34, 35, 44, 57, 107
  growing 144
  growth in trade 45
rice crackers, quantitative and qualitative testing 214–15
robotic milking systems 62
root nodules, for nitrogen fixation 56
rotary dairy 61
RSPCA 167
  'Choose Wisely' initiative 167–8
  'Hens Deserve Better' campaign 167
  'Set a Sister Free' campaign 167

S

Sabbath, Katherine 255
sakia (waterwheel) 59
sales targets 183
salmonella poisoning 202
salt 52
  growth in trade 53
Sami people 2, 7
  food gathering 8
  hunting and fishing 9
  lifestyle 7–8
scaling-up 179
Schneider, Hermann 104
screening and evaluating ideas 178
seafood allergies 252
seasonally available ingredients 229
second-stage screening 178
sedentary hunter-gatherer communities 9–10, 11
seed drill 58
seed processing 80
seed varieties, high-yield 57, 89
sensory analysis tests 211–13
  conducting 213–16
sensory properties of food 204–8, 211
shadoof 58
sheep industry, development, Australia 91
sheep-meat production, Australia 145
Shepparton Preserving Company 98
Shintoism 33, 34
shopping for food 233
  calculating quantities of food 234–5
  costing a recipe 235–6
  making the budget go further 233–4
  to minimise waste 238
siida 8
Silk Road 48, 49
Simplot 156
size 209
skills and knowledge of food preparation 226–7, 253–4
'skip' app 119
slow food movement 124
smell, sense of 207–8
smoked foods 123
Snowy Mountains Scheme 92, 103
soba noodles 34
social considerations in meal preparation 216
social media 118, 121–2
  food posts 122, 255
soluble fibre 246
Somali cuisine 107
sowing machinery 58
soy allergies 252
Spain
  geography and climate 27
  meal structure 28
  regional influences on food production 26–7
  religion 27
  traditional foods 27–8
spanakopita 113
Spanish conquistadors 36
spears and spear throwers 77
specific dietary needs, managing food choices to meet 242–52
specifications (design brief) 177

spices 48
  growth in trade 48–9, 65
squash 13
star diagrams 213
state authorities responsible for food legislation 186, 195
stone fruits 147
stone technology (Indigenous Australians) 79
storing food 238
strategic planning 160–1
'strippers' 88
stuffed vegetables 112
'stump-jump' plough 88–9
Sub-Saharan Africa 18
  food production and food culture 18
  see also Ethiopia
subcultures 123
substitution ingredients for individuals with food intolerances and allergies 251, 252
Subway, and cage-egg production 166
sugar 49–50
  analysing varieties of 51
  growth in trade 50
sugar beet 49
sugar cane 49, 50, 144
Sumerian farmers 11, 13
superphosphate 89
sushi 34
sustainable food movement 123
swidden farming 12
SWOT analysis 182
system for responding to a food poisoning incident 197–8

T

tabouli 23
tandoori 30
target market, review 182
tariffs 142
taste tests 206, 215
  conducting 215
tastes, basic 206
tea
  cultivation 46
  growth in trade 46
technological development
  in food processing 60–3
  in primary food production 56–60
teff flour 19–20, 108
television cooking programs 127, 226, 254
terraced farming 12
texture (food) 208
Teys Australia 156
threats to the quality of food grown in Australia 149–50
time management (meal preparation) 231–2
tomatoes 147
tools and technology, used by Indigenous Australians 76, 77–9
traceability system (food manufacturing) 159
tractors 57, 89
trade in food (historically) 42–3
  coffee 48
  grains 44–5
  salt 53
  spices 48–9, 65
  sugar 50
  tea 46
  see also exports; imports
trade routes 42, 43
transporting perishable goods 65–6
triangle test 214
  Australian cheddar cheese 214
tropical fruits 147
two-minute noodles 245
'two-out-of-five' tests 214
type 2 diabetes 244
tzatziki 110, 114

U

UHT (ultra-high-treatment) milk 62, 146
ultrafiltration 62
umami 207
urbanisation 149
'use-by' date 190, 237, 238

V

vegans 250
vegetable gardens 228
vegetable production 93–4, 148, 149
vegetables 244
  bitter flavour removal 80
  buying 238
  as food waste 237
  Greek meals 112
vegetarian diet 249–50
vegetarian dishes 30, 33, 34
Victoria, implementation and enforcing food safety legislation 195–6
Vietnamese boat people 105
Vietnamese communities 105
Vietnamese grocers and restaurants 105–6
Vietnamese herbs and spices 105
viscosity 212
vitamin D 247
volume 212

W

wat 20, 108
water
  access to 11
  finding, by Indigenous Australians 82
waterwheels 59
wattleseeds 73, 131
wheat 13, 14, 44, 88
  growth in trade 45
  high-yield varieties 57, 89
  production 143–4
wheat industry, development, Australia 88–9
whey 147
woomeras 77
Wurundjerri people of the Kulin Nation 70

Y

'yandying' 78

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