CHAPTER 7

Animals as food

ACCESS PRIOR KNOWLEDGE

1. Name the animals that are most commonly eaten for their flesh and muscle in Australia.
2. Discuss why meat can sometimes be tough when it is eaten.
3. Explain how meat can be tenderised.
4. Suggest why it is essential that chicken is cooked properly.
5. Explain why it is important to include fish in a balanced diet.

Uncorrected 4th sample pages • Cambridge University Press © Lasslett and Collins, 2017 • ISBN 978-1-316-64912-1 • Ph 03 8671 1400

7.1 Meat: The basics

Meat is the edible part of the flesh or muscles of animals. In Australia, we most commonly eat the meat from cattle, sheep, chicken and pig. Many people also eat rabbit, deer, kangaroo, goat or birds such as duck.

meat The flesh of an animal that is edible.

Figure 7.1 These animals are all commercially farmed in Australia.

7.1 LET'S COLLABORATE

What animals provide food for humans? With a partner, discuss which animals provide us with lamb, beef, pork, venison, bacon, ham, mutton and veal.

History of meat

People have been hunting and consuming meat for thousands of years. Farms began to develop in Australia in the first few decades after European settlement. When the First Fleet arrived in Australia, it was carrying two bulls, six cows and 44 sheep, together with pigs, goats and poultry. So began farming in Australia. In terms of meat, these farms mainly raised sheep that originally had been brought over from Europe. In 1900, beef and dairy cattle became important in terms of farming for food.

livestock Breeds of animals that are regarded as an asset.

The grazing of **livestock**, sheep and cattle takes up a lot of the land in Australian agriculture.

Figure 7.2 The main livestock populations of each state in Australia.

Sustainable table

RSPCA – Better beef cattle welfare

The RSPCA has developed a vision for cattle farmers to implement principles and practices designed for continual improvement in animal welfare for all beef cattle farms. The principles are based on the Five Freedoms:

1 Freedom from hunger and thirst
2 Freedom from discomfort
3 Freedom from pain, injury or disease
4 Freedom to express normal behaviour
5 Freedom from fear and distress.

Find out more about Beef Cattle Welfare on the RSPCA website.

Uncorrected 4th sample pages • Cambridge University Press © Lasslett and Collins, 2017 • ISBN 978-1-316-64912-1 • Ph 03 8671 1400

7.2 Structure of meat: Physical properties

Meat is made up of tiny muscle fibres that are held together by connective tissue or **collagen**. The three main structures of meat that can be seen under a microscope are shown in Figure 7.3.

collagen A long, stiff protein that is made up of three separate molecules composed of amino acid chains, twisted around each other. The more collagen there is in a piece of meat, the tougher it is to chew and eat.

slaughter The killing of an animal for its meat.

carcass The slaughtered body of an animal killed for its meat.

aged Describes the meat of a slaughtered animal that is left to hang for a period of time to increase its tenderness.

Tenderness of meat

The way in which an animal is raised and **slaughtered** influences how tender the final product will be. When an animal is slaughtered, the **carcass** becomes stiff due to the chemical changes in the body of the animal after death. After approximately six hours, the carcass returns to normal as the muscles relax under the influence of other body chemicals. After this period of time, the meat can be **aged** for five days and up to two weeks. During the time the meat is allowed to age, muscle fibres break down, causing the meat to become more tender. The practice of hanging a carcass helps this process.

Fresh meat can be tenderised before cooking by physically changing the muscle fibres and the connective tissues of the meat. This is done by mincing, dicing, pounding or slicing it. Meat can also be made more tender by chemical methods, such as marinating the meat with ingredients such as oil, soy sauce, even garlic and ginger. Marinating meat helps to make meat tender but it is also one of the best ways to give it more flavour.

Tasty Trivia

The fat layer under the skin of an animal serves the same purpose as the layer of fat underneath the skin of humans: to provide warmth and protection. Marine mammals have a particularly thick layer of fat, called blubber. Why do you think they have such a thick layer of fat?

7.2 LET'S COLLABORATE

As a class, name the types of meat produced by:

- livestock in Queensland and New South Wales
- livestock in Victoria and Western Australia.

REFLECT ON LEARNING

1. Define the term 'meat'.
2. Make a list of the animals we eat for meat.
3. Where did Australia's first sheep come from?
4. Name the places where Australia's beef producers are located.

Connective tissue: the tissue that holds the muscle fibres together. This tissue is made up of a protein substance called collagen. The collagen is thicker in the parts of an animal that have the most activity. The collagen is the tough part of the meat.

Muscle fibres: the bundles of meat strands that are made up of protein and water. These strands make up the muscles of the animal.

Fat: small amounts of fat found between meat fibres. There is also a thick layer of fat underneath the skin.

Figure 7.3 The structure of meat

Uncorrected 4th sample pages • Cambridge University Press © Lasslett and Collins, 2017 • ISBN 978-1-316-64912-1 • Ph 03 8671 1400

7.3 INVESTIGATE IT

Tough and tender: Sheep and cows

Look at the pictures of the cow and the sheep. Use the internet to research which parts of these two animals would be tough and use a pencil to mark them on the pictures above. Place a tick on the sections that would be tender.

Tasty Trivia

Game birds are wild birds that are hunted for sport. Some examples of these are pheasant and grouse.

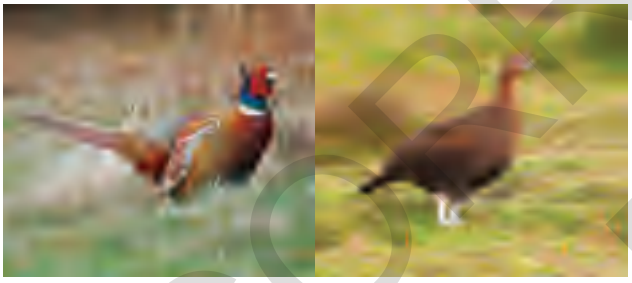

Figure 7.4 Carcasses are hung to age the meat.

There are so many different meat products

The three main classes of mammals bred for human consumption in Australia are cattle for beef and veal; sheep for lamb and mutton; and pigs for pork, ham and bacon. Here are some interesting facts about meat:

- Meat is named according to the animal from which it comes and the length of time for which the animal has lived.
- Beef and veal are the meat from cattle. Veal comes from an animal that is approximately six months old; the meat is white to pale pink in colour and has a very small amount of fat.
- Yearling beef is approximately one year old. It has a deeper pink colour, firm flesh and clearly visible fat.
- Sheep give us lamb; spring lamb comes from an animal that is up to 12 months old, with a pink flesh and creamy-looking fat.

Figure 7.5 Pounding meat is only one of many ways to tenderise it.

- Pork comes from pigs. These animals are approximately six to nine months old; the flesh is pale pink and the fat is white in colour. Pork can be purchased in many different ways – fresh, smoked or salted – and it is used in sausages and many other smallgoods.

Uncorrected 4th sample pages • Cambridge University Press © Lasslett and Collins, 2017 • ISBN 978-1-316-64912-1 • Ph 03 8671 1400

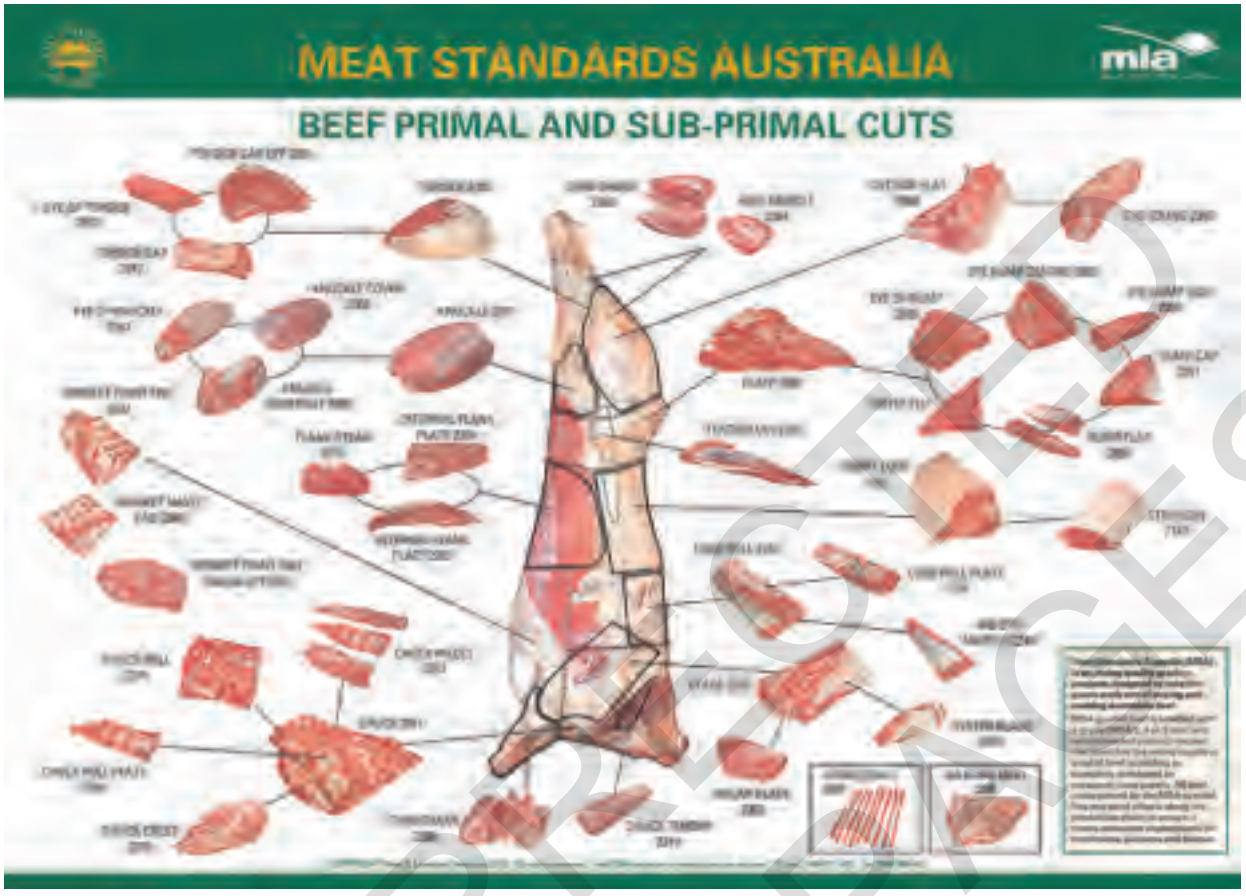

Figure 7.6 A wide variety of meat cuts is available. Identify the cuts that you do not know and find out how they can be cooked.

7.4 ACTIVITY

Eating wild animals

1 Many other types of animals are hunted or raised for their meat. Investigate the farming of one of these animals:

- buffalo
- crocodile
- deer
- duck
- emu
- goanna
- goose
- possum
- quail
- rabbit
- wallaby.

2 Produce a visual display to explain the following:

- **a** List and describe the cultures that mainly eat the animal chosen.
- **b** List the physical properties of the meat when it is raw and also when it is cooked.
- **c** Compare the nutritional value of beef and the animal you are investigating.
- **d** Detail the price you would expect to pay per kilogram for this type of meat.
- **e** Suggest four recipes or meals that could be prepared using this animal.
- **f** Explain the 'traditional' method used for cooking this animal.

Uncorrected 4th sample pages • Cambridge University Press © Lasslett and Collins, 2017 • ISBN 978-1-316-64912-1 • Ph 03 8671 1400

7.5 ACTIVITY

Meat around the world

Meat is used in a wide range of recipes and dishes from around the world. Copy and complete the table below to match the type of meat with the dishes from around the world. Think about each of the recipes and see whether you can list two other ingredients included in each of the dishes. An example is provided to get you started.

Dishes from around the world	Type of meat used	Two other ingredients included in this dish
Barbecue spare ribs	Pork ribs	Chinese five spice, brown sugar
Spaghetti Bolognese		
Fajitas		
Rogan josh		
Massaman curry		
Shish kebab		
Wiener schnitzel		
Stroganoff		
Burger		
Chilli con carne		
Pâté		
Meat pie		
Paella		

DESIGN BRIEF: KANGAROO AND LEEK PIES

The Kangaroo and Leek Pies recipe on p.176 is going to be produced by the local gourmet pie shop. It is looking for two new pies to sell. You have been asked to develop another pie using the recipe as a starting point. The pie is to contain meat, but it should not be beef, and it must also contain at least one vegetable.

Uncorrected 4th sample pages • Cambridge University Press © Lasslett and Collins, 2017 • ISBN 978-1-316-64912-1 • Ph 03 8671 1400

Kangaroo and leek pies

AUSTRALIA

RECIPE

Main tools and equipment

Knife, measuring cup, measuring spoon, measuring jug, fork, scale, chopping board, frying pan, 6-hole large muffin tray

Production skills

Dicing, slicing, chopping, beating

Cooking processes

Frying, baking

SERVES 2 (6 SMALL PIES)

Preparation time: 30 minutes

Cooking time: 20 minutes stove top, 20 minutes baking

Serving and presentation time: 5 minutes

Total time: 75 minutes

Ingredients

 10 g butter	 100 g kangaroo meat, diced	 100 g button mushrooms, cut into quarters	 ½ leek, thickly sliced	 ¼ cup red wine vinegar	 ½ tablespoon plain flour
 ½ cup sour cream	 ½ tablespoon Dijon mustard	 ½ tablespoon rosemary, chopped	 2 sheets ready-rolled puff pastry	 1 egg, lightly beaten	

Method

1. Preheat oven to 180°C.
2. Melt half the butter in a non-stick frying pan.
3. Cook the kangaroo meat until it is browned all over. Remove the meat from the frying pan and place on a plate.
4. Melt the remaining butter in the frying pan.
5. Add the mushrooms and leek, stir and lightly fry for about 5 minutes until the leek is transparent.
6. Add in red wine vinegar and flour, stir until the mixture boils and thickens.
7. Stir in the kangaroo, sour cream, mustard and rosemary.
8. Lightly grease a six-hole large muffin tray.

Uncorrected 4th sample pages • Cambridge University Press © Lasslett and Collins, 2017 • ISBN 978-1-316-64912-1 • Ph 03 8671 1400

9 Cut the pastry into six circles large enough to fill the muffin tray circles. Gently place pastry into the muffin tray to make the pastry cases.

10 Divide the filling evenly among the six pastry cases.

11 Cut six more rounds to fit as lids on the tops of the pies.

12 Top the pies with the pastry lids. Brush with egg wash. Use a fork to decorate the edges and pierce the pastry cases twice.

13 Bake in the oven for 20 minutes or until the pastry is lightly browned.

Note: If kangaroo is unavailable, substitute diced lamb, beef or even chicken.

Evaluating

1 Explain why you chose the pie ingredients for your design brief.

2 Identify what was difficult about this production task.

3 Make a list of the processes that you needed to carry out in order to complete this task.

4 List the skills you need to carry out these processes. Critically evaluate your level of skill.

5 List two safety and two hygiene procedures that you followed during this production task.

6 Suggest any safety procedures you did not follow that you believe you should have.

REFLECT ON LEARNING

1 List the three main structures of meat.

2 Discuss the component of meat that makes it tough.

3 Identify the sections of a cow that will produce tough meat. Explain why this is the case.

4 Explain how it is possible to make meat more tender.

5 Compare the age and appearance of spring lamb and pork.

Physical properties of meat

When you buy meat, make sure it comes from a healthy animal by checking for specific physical characteristics, shown in Figure 7.7.

- Beef should be a bright red colour, and be moist and firm with white-coloured fat.

- Veal should be pale pink in colour and have no or few signs of fat.

- Pork should be a bright pale-pink colour, and be moist with soft-looking white fat.

- Lamb should look bright pink in colour, and be moist and tender with the fat looking hard and pale in colour.

- Mutton should look dark red in colour with yellowish coloured fat.

Figure 7.7 The physical appearance of meat will vary depending on the cut and the animal from which it comes.

7.3 Nutritional value of meat: Chemical properties

The nutritional value of meat depends on the type of animal and the part of the animal that is eaten. The muscle tissue of meat is high in protein; it contains all of the essential amino acids and is a good source of iron and B group vitamins.

Meat – particularly red meat – can be high in saturated fat. The fat content of meat varies widely, depending on the species and breed of the animal, the way in which it was raised and the methods of butchering and cooking used.

You will learn more about saturated fats in Chapter 10.

7.6 ACTIVITY

Good health = lean meat

1 In which section of the Healthy Eating Pyramid does meat belong?
2 Explain why you believe that this is the case.
3 Outline the reasons why it is so important to eat lean meat.
4 The consumption of red meat products has decreased over the last 20 years. Discuss the reasons why you think this has occurred.

5 Explain two ways in which meat could be cooked so that its fat content can be kept to a minimum.

7.7 LET'S COLLABORATE

Wild animals such as deer are typically leaner and therefore contain less fat than farmed animals. Discuss the reasons why you think this is the case.

7.4 Cooking meat

The cooking of meat helps to obtain a **palatable**, high-quality product. Tough cuts of meat need to be cooked slowly in liquid to soften the meat fibres. Tender cuts of meat should be cooked quickly without liquid as muscle fibres are softer.

palatable Having a good taste or mouthfeel when eaten.

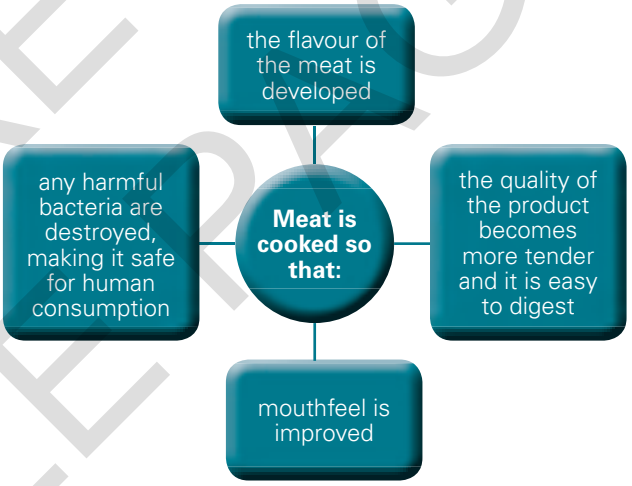

Figure 7.8 Reasons for cooking meat

Best quality: Check out the meat

When selecting or purchasing meat, there are a few simple tips to follow:

1 Check out the colour of the meat: dark-coloured meat indicates aged or mature meat.
2 Check out the colour of any bones that may be included in the cut of meat: pink bones indicate a young animal; white bones indicate a mature animal.
3 Check out the use-by dates on packaged meats; never purchase meat if it is past its use-by date! And never buy meat that smells or looks old.

Uncorrected 4th sample pages • Cambridge University Press © Lasslett and Collins, 2017 • ISBN 978-1-316-64912-1 • Ph 03 8671 1400

coagulation The changing of a protein from a liquid to a solid when heated or agitated.

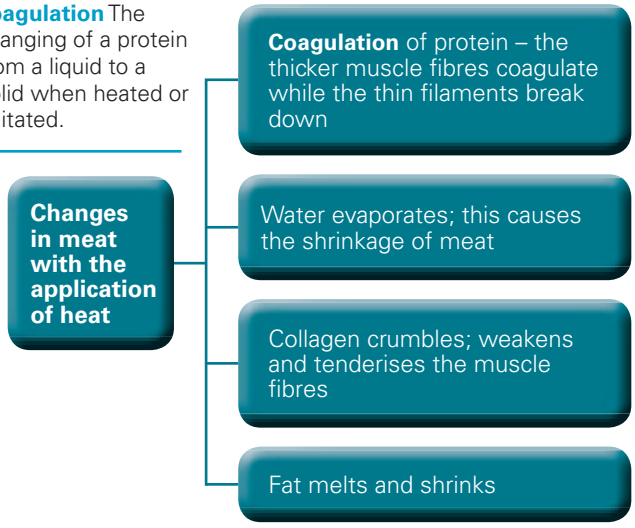

Figure 7.9 Changes in meat due to heat

Tasty Trivia

Goannas are one of the animals traditionally hunted by Aboriginal and Torres Strait Islander peoples. Goannas usually are cooked whole in their skins on the hot coals of a campfire. This makes the meat juicy and sweet.

moist heat Any cooking technique that involves cooking with moisture: steam, water, stock, wine or some other liquid. Generally, low temperatures are used.

dry heat Any cooking technique where the heat is transferred to the food without moisture. Dry heat cooking involves high temperatures.

hydrolysis A chemical reaction with water that causes decomposition of the muscle fibres.

Methods of cooking meat

Meat can be cooked by **moist heat** or **dry heat**.

Dry heat method

Dry heat methods are used to cook tender cuts of meat. These cuts of meat have small amounts of connective tissue, so cooking is not needed for **hydrolysis** of the collagen.

CREATE A SOLUTION

Traditional Aboriginal and Torres Strait Islander methods of cooking meat involved the roasting of meat on hot coals. This was the basic technique for cooking flesh, including most meats, fish and small turtles. In order to soften the meat, slow roasting was also used. This involved covering the meat with coals and ashes. After cooking, the meat would be consumed quickly.

For animals, such as kangaroo, the fur would first be singed off in the flames. As the carcass started to swell, it would be removed from the flames, gutted and the remains of the fur scraped off with a sharp implement. By this time the fire would be a bed of hot coals on which the carcass would be cooked further.

You have been given a tough piece of kangaroo to cook. Investigate the cooking and preparing of the kangaroo and explain how you would cook it in the school kitchen to meet the cultural requirements of the local Aboriginal and Torres Strait Islander community.

7.8 LET'S COLLABORATE

Each animal can provide us with tender and tough cuts of meat. Research and list two tender cuts and two tough cuts of meat, and state the method of cooking that should be used for each cut.

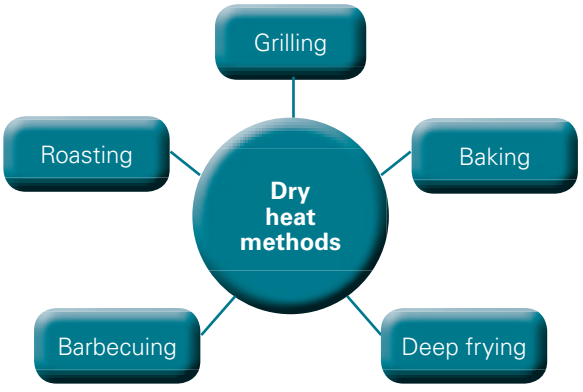

Figure 7.10 Dry methods for cooking meat

Uncorrected 4th sample pages • Cambridge University Press © Lasslett and Collins, 2017 • ISBN 978-1-316-64912-1 • Ph 03 8671 1400

7.9 ACTIVITY

Dry methods for cooking meat

Dry heat surrounds the meat and cooks it. This method of cooking does not involve any moisture, but uses high temperatures.

Look at the meat cuts chart in Figure 7.6 on p.174, then copy and complete the table below. Suggest two cuts of meat that would be used for each dry cooking method.

Dry heat cooking method	Cuts of meat
Baking	
Grilling	
Roasting	
Barbecuing	
Deep frying	

Cooking meat by moist heat

Moist heat cooking involves cooking meat with the use of moisture. The liquid or moisture used can include steam, water, stock or wine. Lower temperatures are used as opposed to dry heat cooking. Tougher cuts of meat are generally cooked by this method, as it softens the collagen of the meat. Seasoning, sauces and flour are added during cooking to enhance the flavour and texture of the final meat dish.

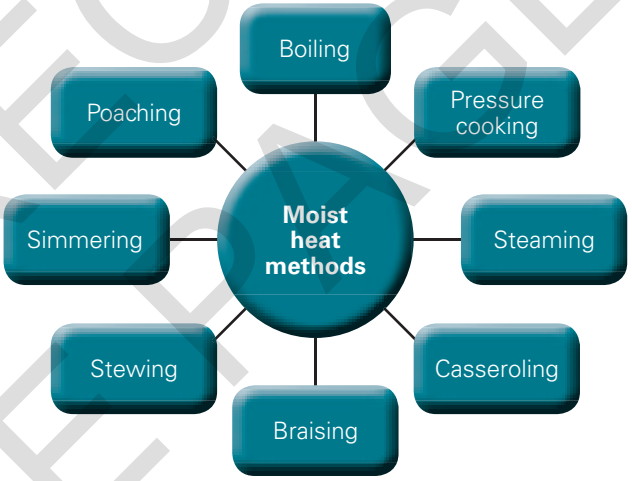

Figure 7.11 Moist methods for cooking meat

7.10 ACTIVITY

Moist methods for cooking meat

Investigate recipes to cook meat by moist heat.

1. Explain how this method of cooking is carried out.
2. Search a variety of recipe books (not on the internet this time) to find two recipes to cook meat using this method. Find one recipe for beef and one recipe for lamb.
3. For each of the recipes, do the following:
   - **a** Identify the cut of meat that is used for your moist heat cooking method.
   - **b** Explain the types of liquid used in heat transfer for this cooking method.
   - **c** List the seasonings or flavours used in this recipe.
   - **d** Discuss how long it takes to prepare this recipe.
   - **e** List the reasons why you think many people choose not to prepare meat using this method of cooking.

Uncorrected 4th sample pages • Cambridge University Press © Lasslett and Collins, 2017 • ISBN 978-1-316-64912-1 • Ph 03 8671 1400

Tasty Trivia Until the late nineteenth century, rural communities in North America would gather together to build giant tepees from wood. The tepee was covered with a mixture of mud and water. Once the covering had dried, a fire was set and an oven was created. Whole animals were cooked to feed the people of the community.

REFLECT ON LEARNING

1. Explain the nutritional value of meat. Explain why some meat can be high in fat.
2. Discuss the reasons why meat is cooked before we eat it.
3. Describe the changes that occur with the application of heat that make meat more pleasing to our tastebuds.
4. Outline why you should never buy meat that is past its use-by date.
5. Compare the different methods used to cook meat.

Check out poultry

Chicken, duck, turkey, pigeon, quail, goose and pheasant are all different types of poultry that are eaten. Chicken is the most commonly eaten poultry in Australia.

Tasty Trivia Each Australian eats on average 46.2 kg of chicken meat per year. About 50 years ago, Australians ate just 7 kg of chicken per person per year. This change came about because chicken meat became cheaper as the chicken industry became more efficient and increased productivity.

Poultry is cooked in order to ensure that micro-organisms are destroyed, to tenderise the meat and to develop flavour.

Undercooked chicken is a common cause of **salmonella** food poisoning, so it is important to ensure that all chicken is cooked properly.

salmonella A bacterium that causes food poisoning.

When chicken is cooked properly, the meat changes colour from pink to white, the flesh will feel soft and will break away easily if it is on a bone, and the juices will be clear rather than red or pink in colour.

7.11 INVESTIGATE IT

For everything chicken related, check out the Australian Chicken Meat Federation's website. Get on to the 'Chook Chat' and find out more about the chicken industry. Watch the Farm Visit video to find out what a typical Australian chicken farm is like. Click on to the 'Chicken Welfare Site' and watch the video *How Chicken Farmers Care for Their Birds*. Decide for yourself whether and how much chicken welfare matters.

Tasty Trivia Poultry is an excellent source of protein and B group vitamins – thiamin, riboflavin, niacin and minerals. The skin of poultry has a layer of fat just beneath the surface; if this is removed, the rest of the meat of a chicken is very low in fat.

Uncorrected 4th sample pages • Cambridge University Press © Lasslett and Collins, 2017 • ISBN 978-1-316-64912-1 • Ph 03 8671 1400

Figure 7.12 Which of these cuts do you prefer? Do you know how to prepare the different cuts to bring out the flavour?

7.12 LET'S COLLABORATE

Make a list of as many different cuts of chicken as you can think of. Compare your list with that of your partner and add to your own list.

7.13 ACTIVITY

Free range, organic: What's the difference?

Use the internet to find out the difference between free-range chickens, organic chickens and conventionally farmed chickens. Use the Australian Chicken Meat Federation website as a starting point. From your research, make a decision about which type of chicken meat you would prefer to eat. Discuss why you have reached this decision.

Figure 7.13 Always ensure chicken is cooked properly.

When storing poultry, it is important to remember that it is a **perishable** food product, and therefore needs to be well wrapped or covered and kept in the refrigerator or freezer. Any leftover poultry food products should also be well wrapped or covered, and refrigerated immediately. When you want to eat the leftovers, you must either eat them cold or heat them thoroughly.

perishable Subject to decay.

7.14 LET'S COLLABORATE

Discuss with a partner how you know when chicken is cooked.

Uncorrected 4th sample pages • Cambridge University Press © Lasslett and Collins, 2017 • ISBN 978-1-316-64912-1 • Ph 03 8671 1400

REFLECT ON LEARNING

1. Explain the structure of poultry.
2. Discuss the reasons why it is critical that chicken is cooked properly.
3. Compare the nutritional value of poultry and that of red meat.
4. Chicken is highly perishable. Explain what this means.
5. Provide a list of observations that you could make to see whether a chicken is cooked properly.

Ethical issue: Free-range and organic chicken

With a growing understanding and increased emphasis on the ethics of food, people want more choice about their food and how it is produced.

Chicken is no exception. While conventionally farmed chicken accounts for 95 per cent of chicken available in the marketplace, free-range and organic chicken products have become available and demand for chicken farmed in these ways is increasing.

Free-range chicken

As the name suggests, **free-range chickens** are allowed to roam freely outside during the day, but roost in sheds at night. The health issues of free-range birds are also managed differently. Sick birds are treated with antibiotics, but these birds are no longer able to be sold as free-range chickens.

free-range chickens Birds are allowed to roam freely outside during the day, but roost in sheds at night.

organic Food that is grown and/or produced without synthetic chemicals – for example, no weed killers or sprays to kill insects, moulds or fungus.

Certified organic chicken

Organic chicken meat complies with the same requirements as free-range chicken, as well as meeting two extra conditions. The chickens must be fed with predominantly certified organic ingredients and the birds are not able to be treated with vaccines.

The consumer demand for free-range and organic chicken is increasing and expected to continue to grow as consumers become more interested in the origins and production of their food products.

7.15 ACTIVITY

Free-range standards

Visit the Free Range Egg & Poultry Australia website and answer the following questions:

1. What is FREPA and what is it dedicated to doing?
2. List the free-range meat bird standards.
3. Explain why these standards have been set.
4. What is RangeCare and how does this approach impact chicken meat?
5. How can you be certain that you are buying free-range chicken meat?

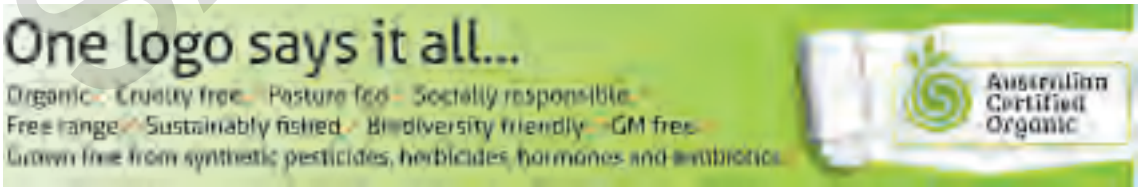

Figure 7.14 The requirements for an Australian Certified Organic label. © Australian Organic Ltd, used with permission.

Uncorrected 4th sample pages • Cambridge University Press © Lasslett and Collins, 2017 • ISBN 978-1-316-64912-1 • Ph 03 8671 1400

Sticky chicken drumsticks with spicy sweet potato skins and avocado dip

RECIPE

Main tools and equipment

Oven, oven tray, bowl, fork, measuring spoons, garlic crusher, lemon juicer, scales

Production skills

Peeling, mixing, mashing

Cooking processes

Roasting, baking

SERVES 2

Preparation time: 60 minutes

Cooking time: 60 minutes

Serving and presentation time: 5 minutes

Total time: 125 minutes

Ingredients

 1 medium sweet potato, scrubbed	 2 tablespoons olive oil	 4 chicken drumsticks	 2 tablespoons maple syrup
 2 tablespoons low-salt soy sauce	 1 teaspoon sesame oil	 ½ ripe avocado, stoned and peeled	
 Juice of ½ lemon	 100 g cream cheese	 Salt and pepper	
 1 clove garlic, crushed	 ¼ teaspoon paprika	 ¼ teaspoon chilli flakes	

Uncorrected 4th sample pages • Cambridge University Press © Lasslett and Collins, 2017 • ISBN 978-1-316-64912-1 • Ph 03 8671 1400

Method

1. Preheat oven to 180°C.
2. Rub the sweet potato with half the olive oil, place on a non-stick pan and bake for 40–50 minutes or until flesh is soft.
3. Trim the chicken drumsticks of any excess skin.
4. Mix the maple syrup, soy sauce and sesame oil in a bowl. Add the chicken drumsticks and coat well.
5. Place the drumsticks onto a non-stick tray and roast in the oven for 30–40 minutes. Coat the drumsticks with the sauce once during the cooking time.
6. In a small bowl, mash the avocado and mix with the lemon juice, cream cheese, and salt and pepper.
7. Remove the sweet potato from the oven, cut in half lengthways and carefully scoop out the flesh, leaving at least 1 cm of the sweet potato on the skin.
8. Cut the skins into wedges.
9. Put the remaining olive oil in a bowl with the garlic, paprika, chilli flakes, salt and pepper. Mix until combined.
10. Toss the skins in the oil mixture and spread onto the non-stick tray. Bake in the oven until chicken drumsticks are cooked.
11. Serve the chicken drumsticks with the spicy sweet potato skins and avocado dip.

Check out fish

Flathead, prawns, scallops and mussels are some of the different types of seafood that we eat in Australia. Seafood is any sea animal or seaweed that is served as food or is suitable for eating. There are many classifications of seafood such as **aquatic** **vertebrates** and **shellfish**.

aquatic relating to water.

vertebrates Animals or fish with a backbone.

shellfish An invertebrate water animal that has a shell.

7.16 LET'S COLLABORATE

Make a list of vertebrates that we eat in Australia. Then make a list of shellfish that we eat in Australia. Compare your lists with those of a partner and add to each of your lists.

Figure 7.15 Seafood salads are healthy and taste good!

CREATE A SOLUTION

There are a number of different fish types available for purchase and for catching in Australian waters. You may have been lucky enough to have gone fishing and caught a rainbow trout. Research the rainbow trout to find out whether it is suitable for the Fish Fingers and Wedges recipe on p.186.

Uncorrected 4th sample pages • Cambridge University Press © Lasslett and Collins, 2017 • ISBN 978-1-316-64912-1 • Ph 03 8671 1400

Fish fingers and wedges

SCOTLAND

RECIPE

Main tools and equipment

Knife, measuring spoons, measuring cups, measuring jug, fork, chopping board, baking paper, baking tray

Production skills

Beating, cutting, crumbing

Cooking processes

Baking

SERVES 1

Preparation time: 30 minutes

Cooking time: 35 minutes

Serving and presentation time: 5 minutes

Total time: 70 minutes

Ingredients

 2 medium potatoes, cut into wedges	 ½ tablespoon canola oil	 ¼ cup plain flour	 ¼ teaspoon pepper
 ¼ teaspoon salt	 ¼ cup milk	 1 egg, lightly beaten	 ½ cup breadcrumbs
 300 g white skinless fish (flathead, whiting, flake), cut crossways into 10 cm long × 2 cm wide pieces	 Cooking spray	 ¼ cup tartare sauce	 ½ lemon, cut into 2 wedges

Method

1. Preheat the oven to 220°C. Line 2 baking trays with baking paper.
2. Place potato wedges onto one of the baking trays. Use a pastry brush to brush wedges with oil. Bake in oven for 20 minutes.
3. Place flour, pepper and salt onto a large flat plate. Stir carefully to combine. Set aside.

Uncorrected 4th sample pages • Cambridge University Press © Lasslett and Collins, 2017 • ISBN 978-1-316-64912-1 • Ph 03 8671 1400

4 Combine milk and egg in a large bowl. Set aside.

5 Place breadcrumbs onto a large flat plate.

6 Set up a flour, milk and egg, and breadcrumb three-phase process.

7 Toss fish in the flour mixture, coat the fish in the milk and egg mixture and coat the fish in breadcrumbs. Repeat with all of the fish.

8 Place all crumbed fish onto the remaining oven tray. Spread out evenly. Spray with cooking spray.

9 Bake fish in oven for 10–15 minutes until golden. Turn once during cooking.

10 Serve with tartare sauce and lemon wedges.

7.17 LET'S COLLABORATE

Seaweeds are rarely considered seafood, even though they come from seawater. Can you think of any foods eaten in Australia that are made of or contain seaweed?

Fish is very similar in structure to meat, although it has very little connective tissue so cooking only needs to be very quick and gentle. If fish is overcooked, the protein shrinks and squeezes out moisture, leaving the flesh dry and rubbery.

In terms of nutrient content, fish is a good source of protein and minerals. Fish contains essential fatty acids called **omega-3 fatty acids**. Omega-3 fatty acids are heart-friendly and should be consumed as part of a well-balanced diet.

omega-3 fatty acids Long-chain polyunsaturated fats that have health benefits.

Tasty Trivia

Omega-3 fatty acids are said to be one of the major reasons for the reduced risk of cardiovascular diseases in Eskimos. The longer life expectancy of Japanese and Nordic populations is also said to be due to their higher consumption of fish and seafood.

Figure 7.16 Seaweed is eaten in large quantities in many cultures.

7.5 Cooking fish

Most fish, like other animal products, needs to be cooked in order to destroy micro-organisms, tenderise or soften it and develop its flavour. **Moderate temperatures** and a quick cooking time are required for fish. If fish is overcooked, it flakes, breaks up, shrinks and becomes dry. Moist cooking methods, such as poaching and steaming, and dry cooking methods, such as grilling, deep frying and baking, can be used to cook fish.

moderate temperatures 160 to 180°C.

7.18 LET'S COLLABORATE

Fish can be served raw. Can you think of some examples of ways in which raw fish is eaten?

Fish can also be preserved: it can be dried, smoked, frozen, salted, pickled and canned.

Figure 7.17 In many cultures, food is left to dry in the sun, like these cuttlefish.

Uncorrected 4th sample pages • Cambridge University Press © Lasslett and Collins, 2017 • ISBN 978-1-316-64912-1 • Ph 03 8671 1400

Seafood allergy is a type of food allergy where the sufferer is hypersensitive to shellfish, scaly fish or **crustaceans**. These seafoods cause an overreaction of the immune system, leading to severe physical symptoms. The most severe seafood allergy is called **anaphylaxis**.

crustacean A hard-shelled invertebrate animal.

anaphylaxis An extreme allergic reaction to a food product.

Storing fish

Fish should be stored at cold temperatures at all times. It is important to wrap fresh fish tightly, as the odour of fish can affect other food items in the refrigerator. It is also important to use fish within two days of purchase to ensure that it is of the best possible quality.

Selecting fish for optimal quality

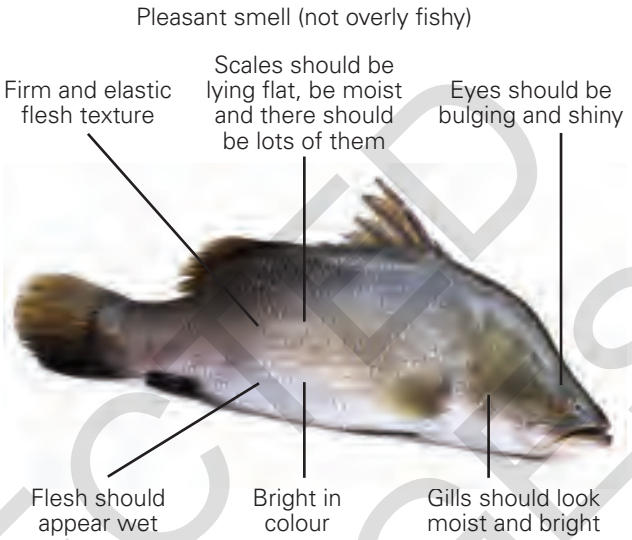

Figure 7.18 Selecting fish

DESIGN BRIEF: FISH FOR LUNCH

Create a lunch wrap that contains a preserved fish product. The wrap should be low in cost, quick and easy to prepare, and needs to take into consideration the foods suggested by the Healthy Eating Pyramid or the *Australian Dietary Guidelines*. Use your imagination to create your own solution to the design brief. Make two wraps – one for yourself and one for a friend, who will help you to carry out a sensory analysis.

Sustainable fishing

It is very important when growing, harvesting and catching food that we consider the environment and ensure that we are taking foods – particularly fish and seafoods – at sustainable rates. Sustainable fishing attempts to provide humans with food, fish oil, animal feed and any other fish or seafood products in a manner that is ecologically friendly, economically viable and equitable, and socially responsible to future generations. For more information about the status of Australian fish stocks, refer to the Fisheries Research and Development Corporation (FRDC) website.

Figure 7.19 A salmon farm in Tasmania

Uncorrected 4th sample pages • Cambridge University Press © Lasslett and Collins, 2017 • ISBN 978-1-316-64912-1 • Ph 03 8671 1400

Tuna bites with sweet chilli dipping sauce

Main tools and equipment

Knife, measuring spoon, measuring cup, fork, food processor or plastic bag and rolling pin, frying pan

Production skills

Chopping, mashing, shaping

Cooking processes

Frying

MAKES 10

Preparation time: 40 minutes

Cooking time: 15–20 minutes

Serving and presentation time: 5 minutes

Total time: 60–65 minutes

Ingredients

 100 g canned tuna in spring water, drained	 1 egg	 1 teaspoon continental parsley, finely chopped	 Salt and pepper
 2 slices stale wholemeal bread	 ¼ cup plain flour	 2 tablespoons olive oil	 ¼ cup sweet chilli sauce, for serving

Method

1. Mash together the tuna, egg, parsley, salt and pepper.
2. Using a food processor or a plastic bag and rolling pin, process/crush the bread until it forms a fine crumb.
3. Add the breadcrumbs and a small amount of flour at one time in order to bind the mixture together.
4. Divide the mixture into 10 even portions and shape each portion into a ball. Flatten each ball.
5. Refrigerate for 10 minutes.
6. Place olive oil into a frying pan and heat lightly. Space the balls out evenly in the pan and fry until golden and crisp.
7. Remove from frying pan and drain on kitchen paper.
8. Serve with sweet chilli sauce.

Uncorrected 4th sample pages • Cambridge University Press © Lasslett and Collins, 2017 • ISBN 978-1-316-64912-1 • Ph 03 8671 1400

Tasty Trivia

Sharks: An ethical issue

One of the most threatened groups of fish in Australia is sharks because they are so slow to breed and they are not keeping up with the numbers being caught. In Australia, sharks are the main fish used in fish and chips – better known as flake. To help with the preservation of sharks, next time you ask for fish and chips, perhaps try a different fish. You might enjoy barramundi, whiting, flathead, bream, mullet or snapper. These species are not as overfished as sharks and are a more sustainable choice.

Figure 7.20 High-quality seafood makes for a delicious meal.

7.19 ACTIVITY

Develop two report cards: one for fish and another for shellfish. Research and digitally create an information card to include the following information:

1. definition
2. origin
3. visual examples of different types of both fish and shellfish. Include those that are farmed, hunted and wild.
4. physical properties
5. sensory properties
6. chemical properties.

REFLECT ON LEARNING

1. Suggest three differences in the two classifications of seafood listed on p.185.
2. Explain why it is important not to overcook fish.
3. Compare the nutritional value of fish and red meat.
4. Explain the health implications for a person who has a seafood allergy. In your response, discuss how this can result in anaphylaxis.
5. Finish this sentence: 'For fish to be of the highest quality when it is eaten, it is important to …'

Uncorrected 4th sample pages • Cambridge University Press © Lasslett and Collins, 2017 • ISBN 978-1-316-64912-1 • Ph 03 8671 1400

LOOKING BACK

1 Meat is the edible part of the flesh or muscles of animals. Many different animal products are eaten in Australia. The five main classes of animals bred for human consumption in Australia are cattle, sheep, pigs, chicken and fish.

2 Meat is made up of tiny muscle fibres, which are held together by connective tissue.

3 The nutritional value of meat depends on the type of animal and the part that is eaten. The muscle tissue of meat contains protein, essential amino acids, iron and B group vitamins. Some cuts of meat are also high in saturated fats.

4 Meat can be cooked using a variety of different methods. The dry heat method of cooking is best for tender cuts of meat, and the moist method of cooking is used for tougher cuts of meat.

5 Chicken is the most commonly eaten poultry in Australia. Seafood is also a popular animal food eaten in Australia. Both chicken and seafood have a similar structure to red meat and vary in their nutritional content.

TEST YOUR KNOWLEDGE

Multiple choice

1 Wet methods of cooking used for tough cuts of meat include:
- **a** baking, grilling and roasting
- **b** chopping, dicing and slicing
- **c** boiling, poaching and simmering
- **d** roasting, barbecuing and smoking.

2 When storing poultry, which is a highly perishable food, it should be placed:
- **a** in an airtight container in the cupboard
- **b** on the kitchen bench in the sun to be thawed
- **c** in the fridge, well wrapped
- **d** in the fridge on the top shelf.

True/false

1 The carcasses of animals are cut into the different meat cuts as soon as they are slaughtered.

2 Dry and cold methods of cooking are used to cook different cuts of meat.

3 Seaweed is a type of seafood.

Short answer

1 Meat is the edible part of the flesh and muscles of an animal. List three different types of meats eaten in Australia and suggest a recipe for each.

2 Explain what happens to meat when it is cooked.

3 Describe the nutritional value of meat.

Extended response

Visit the supermarket and complete a table like the one below to make a list of the preserved fish items that are available, and then respond to the questions that follow. You may need to do additional research using the internet to answer these questions.

Method of preservation	Type of fish	Added ingredients	Price

1 List three methods of preservation that are used to preserve fish.

2 Explain how fish is prepared using these types of preservation.

3 Discuss the reasons why preserved fish products require the addition of other ingredients.

4 Compare the keeping time of the preserved fish products with that of fresh fish.

5 Explain how fresh fish should be stored. Contrast this with preserved fish products.

6 Explain why you think there is such a price difference between preserved and fresh fish.

7 Detail the type of preparation and level of cooking skill that is required for frozen fish products. Compare this with a whole fresh fish.

8 Make a list of the ways in which canned fish can be used.

Uncorrected 4th sample pages • Cambridge University Press © Lasslett and Collins, 2017 • ISBN 978-1-316-64912-1 • Ph 03 8671 1400