In this chapter you will learn about:

- layout of food for visual appeal, including styling for photography and plating for service
- sensory characteristics of foods, including appearance, odour, taste (flavour) and texture (mouth feel)
- sensory assessment of a variety of foods.

What was your first reaction when you saw this picture? You might have imagined that you could smell the chocolate and imagined what it would taste like. That’s your senses at work sending messages to the brain saying, ‘Yes, I want cake.’ Presentation, preparation and processing of food should activate the senses and increase our enjoyment of food.
Why do we select one food over another?

Imagine you are going to the local takeaway to get something for dinner. If you are well informed and health conscious, you may choose a tabouli salad, a grilled chicken burger and mineral water. But if the smell of cooking chips and the sight of someone else's takeaway are just too much for you, you may order a serving of chips, a bacon-and-cheese burger and a thickshake.

Our food preferences are influenced by our experiences with food and eating, and sometimes food choices can be influenced by other factors:

- A doctor may instruct you to eat a particular food — for example, an adolescent girl may eat more green leafy vegetables or red meat to improve the iron level in her blood.
- You may avoid a particular food because you are allergic to it or have an intolerance to a chemical found in a group of foods — for example, a person with an allergy to gluten (coeliac disease) avoids wheat products.
- Your strong desire for a healthy body may motivate you to follow the Australian dietary guidelines and avoid any unnecessary fat, sugar and salt.

Even when these factors limit what you can eat, the final choice — which green vegetable, which wheat substitute, which low-fat, high-calcium dairy product — depends on the five senses.

Sensory characteristics of food

Sensory methods are used to evaluate what senses are affected when we eat certain food. Food triggers our senses and all these factors combine to help us make the decision about whether we want to eat a particular food item.

Flavour

The perception of flavour, texture and visual appeal of foods is very important in determining a food's acceptability and quality. Our perception of flavour in a food is a product of the assessment of taste and aroma (smell). Other properties of food, such as temperature and texture, are also very important to the perceived flavour. The best temperature range for flavour evaluation is 20 to 30 °C, although this is not appropriate for foods that should be served either hot or cold (such as ice-cream).

Taste

Chilli crab, a popular dish in Singapore. Is this dish likely to cause a feeling of heat or coolness?

A taste sensation occurs when chemicals in the food stimulate taste receptors (tastebuds) in the mouth. The primary sensations of taste are sweet, salty, sour and bitter. Specific areas of the tongue can detect these tastes, as discussed on page 27. We taste food because the tastebuds on our tongue respond to salty, sweet, bitter and sour flavours.
In addition to the four basic tastes, **umami** can also be detected by the tastebuds. These compounds (such as monosodium glutamate, MSG) are known as flavour enhancers. Other components in food such as tannins (as in tea that has been brewed for a long time) can contribute to taste by creating a characteristic sensation. This sensation is called **astringency**. Some chemicals in food can create a feeling of heat or coolness in the mouth; for example, peppermint makes the mouth feel cool.

**Texture**

Texture describes how a food actually feels in the mouth — between the lips, against the teeth, on the tongue and roof of the mouth (called **mouth feel**) — or in the hand. This is sometimes called tactile texture. Can you recall how a crinkle-cut potato crisp feels in your mouth?

A food also has visual texture. Have you ever been surprised when a wrapped salad roll from the school canteen turns out to be soft when it looked crispy?

Some of the most common ways to describe the texture of foods are listed in the table below.

**Table 4.1 Texture of foods**

<table>
<thead>
<tr>
<th>CHARACTERISTIC</th>
<th>FOODS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardness</td>
<td>Fresh stick of celery</td>
</tr>
<tr>
<td>Softness</td>
<td>Ripe avocado</td>
</tr>
<tr>
<td>Brittleness</td>
<td>Peanut brittle</td>
</tr>
<tr>
<td>Smoothness</td>
<td>Chocolate bar</td>
</tr>
<tr>
<td>Cohesiveness</td>
<td>Sticky caramel bun</td>
</tr>
<tr>
<td>Crumbliness</td>
<td>Sponge cake</td>
</tr>
<tr>
<td>Viscosity (thickness)</td>
<td></td>
</tr>
<tr>
<td>• high</td>
<td>Thick cheese sauce</td>
</tr>
<tr>
<td>• low</td>
<td>Thin gravy</td>
</tr>
<tr>
<td>Elasticity</td>
<td>Grilled round steak</td>
</tr>
<tr>
<td>Chewiness</td>
<td>Baked potato skins</td>
</tr>
</tbody>
</table>

**Aroma**

Everyone knows that hot food has more aroma than cold food. Steam rising off the food carries volatile aromatic substances that contribute to both aroma and flavour. The more the food is heated, the stronger its aroma becomes. (Some cooks depend on the smell of cooking food to know when it is ready.) The next time you use lemon-scented dishwashing detergent, put a small drop in the palm of your hand and smell it. Run some warm water over your hand, then smell the bubbles; despite the detergent now being less concentrated, the smell of lemon is stronger.

Sometimes food is served covered on a dish at the table. As the cover is lifted, the wonderful aroma of the food underneath is released. Cold foods too can have aromas. Many fresh fruits, such as strawberries, pawpaws and mangoes, have distinct aromas that deepen as the fruit ripens.

In recent years, technology has been used to develop machines with ‘electronic sensing’ similar to the human senses that can detect and analyse volatile chemicals at low levels (see page 28).

**Sound**

Although not people’s first thought when selecting a food, sound does play a part in the overall enjoyment of it. There is no doubt that the sound of food sizzling on a platter adds to the food’s appeal. Sound can also create a negative impression; for example, if an apple does not crunch when we first bite into it, we know it is not fresh.

**Visual appeal**

Several factors influence the visual appeal of a food, but colour is one of the most important. The food industry uses many colours in its products because of consumer expectations. The consumer expects certain colours to be associated with certain flavours. For example, an orange-coloured jelly is expected to have an orange taste, cooked meat should look brown, and baked bread should have a golden brown crust. The appearance of a product can also influence the acceptability; for example, scrambled eggs that are very dry and crumbly are not as appealing as scrambled eggs that look moist, and lumpy gravy is usually not acceptable.

Let’s look at the sensory properties of milk and cheese to summarise what we’ve learned so far.

**Table 4.2 Sensory properties of milk and cheese**

<table>
<thead>
<tr>
<th></th>
<th>MILK</th>
<th>CHEESE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Appearance</strong></td>
<td>White liquid; colour affected by the amount of butterfat (cream)</td>
<td>Varies from white to yellow, and to almost blue or green in some blue vein types</td>
</tr>
<tr>
<td><strong>Flavour</strong></td>
<td>Bland</td>
<td>Varies from cream cheese to strong blue cheese and cheddar</td>
</tr>
<tr>
<td><strong>Texture</strong></td>
<td>Smooth liquid</td>
<td>Varies from moist, smooth, spreadable cream to firm, sliceable cheddar; some, such as brie or camembert, when fully ripe, are firm on the outside with a viscous, almost liquid, centre</td>
</tr>
<tr>
<td><strong>Aroma</strong></td>
<td>Faint creamy aroma when fresh</td>
<td>Varies from almost undetectable, such as brie, to very strong</td>
</tr>
</tbody>
</table>

**Sensory tests**

Sensory testing is a **subjective evaluation** of how people perceive a product by using their senses. On the other hand,
the food industry also measures physical properties, such as height and weight of food, and chemical properties, such as pH. A full picture of the properties of a food can be determined by using a combination of these tests.

Most purchased food has been processed in some way, so we will first look at the sensory tests conducted by the food manufacturer. Then we will look at the sensory tests that consumers can conduct in the store or at home before selecting a certain food.

**Sensory analysis** is the analysis of a food’s aroma, taste, overall appearance and texture. It can be done to test the development of a new product or as a way to improve an existing product.

Sensory tests can measure:
- consumer preference for one food over another. Why is the competitor’s product selling more? Does it have a better flavour or colour?
- consumer acceptance or rejection of certain flavours, textures or aromas. Does the new coffee-flavoured biscuit taste the way customers expect it to taste?
- the difference between processing or storing procedures. Does a waxed-paper liner within the box preserve cereal texture more than a foil-lined pouch? Did the increase of temperature by 3°C during the canning process for chicken have any undesirable effects on colour, texture or flavour?

This kind of information is important to the food manufacturer. It helps manufacturers improve the food being developed or already being produced. The more sensory characteristics of the food that the consumer likes, the greater product sales will be.

Various types of sensory evaluation or tests can be done, depending on what the manufacturer wants to know. But during any type of sensory test, certain guidelines need to be followed to achieve useful results.

**Guidelines for conducting sensory tests**

**General organisation**
- Each test should evaluate only one characteristic of a food, such as saltiness.
- No more than five different samples should be tested at any one time. The stronger the flavour of the food is, the fewer samples should be given, because the senses tire quickly and cannot detect differences as easily and accurately. Five different samples should be used only if the foods to be tested are bland or mild in flavour.
- A sensory evaluation sheet should be provided so each panellist carries out the same tests. With some types of test, the panellists can key their choices directly into a computer.
- The product samples should be labelled in a way that prevents the panellist from ranking them in a suggested order. (See the diagrams above right that demonstrate acceptable labelling.)
- Each sample’s random number should be recorded so that the samples are not confused.
- When comparing similar products (such as spaghetti sauce) check the ingredients list on the packages to identify any differences. It would be more accurate to obtain a contents list designed by the manufacturer, but food companies seldom make known their recipes and processing steps.

**Panellists/tasters**
The testers are called panellists or tasters. Panellists can be average consumers who are chosen as typical users of the product or who have volunteered to take part in the test. At other times, experts who have been trained to taste for specific things, such as the taste of vinegar in a salad dressing, are used.
- Tasters should not have a cold because this will dull their senses.
- Testing should occur neither when the taster is hungry nor when they have just finished a meal.
Panellists should take two or three bites or sips of the food for taste and texture tests.
Panellists should rinse their mouths with water after each tasting so the flavour of each sample is not affected by the previous sample.
Differences between products can sometimes be described or explained in the panellist’s own words. Some tests insist that tasters choose one product over another, even if they cannot sense a difference.
Panellists should not discuss their evaluations with other panellists, because this will influence their answers.
Individual results should not be given, although group results may be shown.

Presentation of food
The water for tasters should be at room temperature, because cold water will dull the sense of taste.
The food should be presented at the correct temperature for eating; hot foods are sampled hot and cold foods are sampled cold.
The environment surrounding the testing area should be controlled so that testers cannot see or smell the food before they test, because this may affect the results.
Panellists should be separated from one another by dividers. (See chapter 15, page 288 for more detail.)

Types of sensory tests
Various marketing departments in the food industry conduct their own sensory evaluations and others use independent marketing agencies. There are many tests that can be used for sensory evaluation. Quality testing is done to evaluate the overall characteristics of a food, and to rank a specific quality, by comparing that food with similar foods.

Hedonic scales
Hedonic scales or pleasure scales are used to rate products for acceptability. A simple form of the hedonic scale uses faces that indicate the amount of pleasure gained from a food. This scale can also be useful when children are testing food.

Hedonic scales can also use words in a series of boxes (or a numerical scale) with comments that indicate the different levels of satisfaction about a food. Here is an example of a hedonic scale using words.

<table>
<thead>
<tr>
<th>Overall, how would you rate the taste?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Circle the number that best applies to you.</td>
</tr>
<tr>
<td>1</td>
</tr>
</tbody>
</table>

![Hedonic scale using face pictures](image)

A word hedonic scale where panellists rate the food according to a word association

Descriptive tests
Descriptive tests provide information about certain selected sensory characteristics of food samples. A list of words that describe the characteristics being assessed is presented on a scorecard and the taster selects the most appropriate description based on those words (see table 4.3 below).

Ranking
In ranking tests, several foods of the same kind are assessed together and then placed in order of preference for the characteristic being tested. For example, suppose a food manufacturer wants to produce a cinnamon-flavoured apple pie for older people. A ranking test could use several older people as tasters. Each person could be asked to taste samples of apple pie, each with a different amount of cinnamon flavouring. The tasters would rank the pie samples in descending order, according to their taste appeal.

Several characteristics can be assessed in ranking tests. The ranking system can also be used with descriptive words in the evaluation.

Profiling food
Profiling is a more complex process that ranks descriptive words to create a food profile of the product. The results are presented on a star diagram (see page 71) that has a few or many points, depending on the number of qualities being tested. A star diagram can be used to compare similar products. It could also be used to compare the results of several tasters.

### TABLE 4.3 Classification of different qualities of a banana cake using a reduced-fat butter blend instead of butter. Testers are asked to circle a description for each quality, such as texture and appearance.

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>DESCRIPTION (CIRCLE THE DESCRIPTION THAT YOU THINK IS MOST APPROPRIATE.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Texture</td>
<td>Heavy and doughy; no airholes</td>
</tr>
<tr>
<td></td>
<td>Moist and not crumbly; small airholes</td>
</tr>
<tr>
<td></td>
<td>Some moisture; uneven airholes</td>
</tr>
<tr>
<td></td>
<td>Dry and crumbly; large, uneven airholes</td>
</tr>
<tr>
<td>Appearance</td>
<td>Dark brown</td>
</tr>
<tr>
<td></td>
<td>Golden brown</td>
</tr>
<tr>
<td></td>
<td>Speckled brown</td>
</tr>
<tr>
<td></td>
<td>Pale</td>
</tr>
</tbody>
</table>

![Table 4.3](image)
Difference sensory testing

Difference testing is used to test the perceived or recognised differences between products. The differences can be in appearance, flavour, texture or aroma. At least twenty panellists are needed to ensure the results of a difference test are worthwhile in predicting consumer preference.

It is reasonably easy to identify the difference between just two samples. A taster has a 50 per cent chance of guessing correctly even without tasting! These odds are too high for a food manufacturer to work with, so other comparisons are used to make sure the results of a sensory test indicate more than 50 per cent accuracy.

Paired comparison test

In a paired test, the samples are presented in pairs, but there is more than one pair to taste. Imagine that sample 327 (which we will shorten to P) is a reduced-fat margarine, and sample 881 (shortened to H) is an ordinary margarine. The taster will taste:

- sample P + sample P (first pair)
- sample P + sample H (second pair)
- sample H + sample H (third pair).

With three paired samples, if the taster recognises any difference between the two margarines, it is more likely to be the result of an actual taste difference rather than just chance. If the number of panellists is large enough, the statistics should indicate how noticeable the taste difference will be to the average consumer.

Triangular comparison test

A triangular test is the most common of all difference sensory tests. Remember, the aim is to determine if the tasters can recognise any differences between similar foods.

Only two different samples are tested but they are presented in threes, as the name suggests. The taster is asked to identify the odd one out.

They will taste:
- sample P + sample H + sample P
- then P + H + H
- and so on to P + P + H, H + P + H, H + P + P
- and finally H + H + P.

Sometimes the taster will be permitted to indicate ‘no perceivable difference’ if they are absolutely unable to detect a difference.

A variation of the triangular test is called the duo-trio test. In this test, one of the samples is identified for the taster and acts as a control. The remaining two samples are tasted and compared with the control. They will either taste similar to or different from the control.

Two-out-of-five comparison test

The two-out-of-five test is the most reliable difference test for showing the average consumer’s ability to detect a difference in a food’s appearance and texture. Panellists taste five samples, of which two are the same. They are asked to identify those two samples.

Using the results of the two-out-of-five test, a manufacturer can predict how 90 per cent of consumers will feel about the food. The test is not used for testing taste or aroma, because a large number of samples need to be tested at the one time. Only appearance and texture can be tested.

Sensory test for flavour differences

Syllabus outcome

Students learn to:
- evaluate the appeal of foods using sensory assessment.

Contributes to the following outcome:
- identifies and explains the sensory characteristics of food.

Aim

To determine the effects of colour on flavour recognition, using a triangular comparison test

Equipment

- 12 small fruit bowls
- 4 large bowls
- 4 wooden spoons
- $4 \times 10$ g unflavoured powdered gelatin
- $4 \times 100$ g sugar
- $4 \times 500$ mL hot (but not boiling) water
- orange, red, yellow and blue food colourings
- strawberry, lemon and orange food flavourings
Method

As a class, divide into four groups.

1. Each group makes a batch of the basic jelly recipe in a large bowl (using gelatin, sugar and water).
2. Divide each batch among three small bowls. Add one drop of the colours (as shown below) to each small bowl:
   - Group 1 — orange, in bowls numbered 1–3
   - Group 2 — red, in bowls numbered 4–6
   - Group 3 — yellow, in bowls numbered 7–9
   - Group 4 — blue, in bowls numbered 10–12.
3. Add two drops of orange flavouring to bowls 1, 4, 7 and 10.
4. Add two drops of lemon flavouring to bowls 2, 5, 8 and 11.
5. Add two drops of strawberry flavouring to bowls 3, 6, 9 and 12.
6. Label each of the small bowls with a random three-digit number. Make a chart to record what is actually in each bowl. If you have a computer available, you could produce a spreadsheet similar to the one below.

<table>
<thead>
<tr>
<th>ORIGINAL BOWL NUMBER</th>
<th>RANDOM NUMBER</th>
<th>COLOUR</th>
<th>FLAVOURING</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>751</td>
<td>Orange</td>
<td>Orange</td>
</tr>
<tr>
<td>2</td>
<td>349</td>
<td>Orange</td>
<td>Lemon</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
7. Allow the jellies to set, preferably overnight.
8. Set out the dishes attractively and clearly labelled with the random number.
9. Give each panellist:
   - a spoon (and somewhere to rinse it in hot water between samples, to prevent contamination)
   - a glass of water (and somewhere to fill it when necessary)
   - a pen
   - four sets of samples to test (original numbers 1–3, 4–6, 7–9 and 10–12)
   - a response sheet.
10. Ask the panellist to fill in the following response sheet.

<table>
<thead>
<tr>
<th>SAMPLE CODE NUMBER</th>
<th>WHAT IS THE FLAVOUR OF THE JELLY?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

11. After the panellists have completed the tests, record the responses in a table of results like the one below or on a computer spreadsheet.

<table>
<thead>
<tr>
<th>FLAVOUR</th>
<th>COLOUR</th>
<th>CORRECT</th>
<th>INCORRECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orange</td>
<td>Red</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Orange</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yellow</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blue</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strawberry Red</td>
<td>Orange</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Orange</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yellow</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blue</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lemon</td>
<td>Red</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Orange</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yellow</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blue</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Conclusions

1. How often was the flavour choice correct for:
   a) the orange-flavoured jelly
   b) the lemon-flavoured jelly
   c) the strawberry-flavoured jelly?
2. What was the overall response by panellists to the blue jelly? Why do you think this occurred?
3. What reasons can you give for so few colourless food products being on the market today?

CASE STUDY

Consumer taste testing gone wrong

Christine and Ed, hungry after a long day at work, walked into the conference room of the Allgo Food Company for taste testing. They were the last of the 20 people to sit down at the large table in the middle of the room. Visible in the centre of the otherwise empty table were five trays of the new dips the tasters were to sample.

The trays were labelled: (1) hot and spicy, (2) cajun, (3) curry (Ed shuddered because he hates curry of any kind), (4) satay and (5) Szechuan. A food technologist explained to everyone that they were to sample each dip in order to identify which flavour they liked best and which texture was the most appealing. Everyone was given a score sheet to complete. The technologist said he would return in 20 minutes to see how people were going. In an effort to make the correct choices, Chris and Ed talked freely with the people sitting beside them.
**Consumer sensory assessment**

Consumers conduct their own sensory tests every time they make a food choice. Although they do not have the time, money or experience to carry out elaborate sensory tests as food manufacturers do, they do make choices based on what their senses tell them. Consumers choose most of the food they eat from supermarkets, but they also make food choices in restaurants (especially smorgasbords and takeaways), cinemas, sports arenas and clubs. Food is available at virtually every function and social occasion these days.

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**Case Study Questions**

Carefully consider the article on the previous page. Remember that this is not just a comprehension task; use the stimulus material along with your knowledge of sensory testing to complete the tasks ahead.

1. What kind of sensory test is being used in this case?

2. What correct testing procedures are being used?

3. What factors would interfere with the reliability of this food test?

4. What would be a more reliable test (or tests) for the Allgo Food Company to conduct?

---

**Supermarket shopping — sensory assessment**

When buying food, as well as considering the nutritional content of the food and the money available, consumers make critical judgements on the following characteristics:

- unwanted extras — garnishes, extra liquid and so on
- overall physical appearance — the food’s colour, general shape, turgor and amount of fat
- smell or aroma
- anticipated taste (Remember that taste is a combination of smell and taste.)
- known texture or anticipated texture — consistency, moisture content and mouth feel.

---

**Choosing fresh flesh foods**

Flesh foods include meat, poultry and fish.

**Meat**

In general, the type and age of an animal determines the quality of its meat. For example, the meat of older animals is considered more flavoursome. Expensive cuts of meat are usually more tender than less expensive cuts, and this may affect the cooking time.
Meat will be at its best quality if:
• it does not look stringy and does not have too much visible connective tissue or gristle, unless stewing or casseroling is planned
• the flesh is moist and bright red in colour, with a fresh appearance. Butchers sometimes use special lights in their windows to make meat look a brighter red.
• not too much fat is visible on the outer edges
• the amount of bone is suitable. For example, a large bone is desirable when making soup.
• a ‘packed’ date is clearly visible on pre-packed meat.

In general, you can judge meat to some degree by its appearance. Beef should be bright red, firm and finely grained. There may be marbling, as indicated by flecks of fat through it. Lamb should be a light reddish-pink colour and very tender, with an even edging of firm white or pink fat. Pork should be pale pink, firm and moist, with pearly white fat, and may have finely grained flesh. Veal should be very pale pink and usually with no or very little fat.

Poultry
Poultry includes domestic birds such as chickens, turkeys and ducks. Chicken is one of the most popular foods and its consumption has been increasing over the past 50 years. It can be purchased fresh or frozen. Whole birds are available, as well as separate components that may be sold with or without skin and bones. Examples of different cuts of chicken include whole or halved breasts, breast fillet, drumsticks and thighs. The method of cooking and the cooking time are largely dependent on the bird’s age and the size of the piece.

In general chicken can be classed as:
• poussin or spatchcock (aged about 6 weeks old)
• spring chicken (aged about 8 weeks old)
• roaster (under 6 months old)
• boilers (at least 18 months old), which usually have tougher meat and need moist methods of cooking to tenderise the flesh.

When selecting fresh poultry, the following characteristics should be considered:
• plump with a fresh, clean smell
• no broken bones
• fresh-looking, unmarked (no tears, cuts or bruises), with moist, light cream-coloured skin
• pink flesh with no bruising
• firm, plump breast and thighs.

Fish
A large variety of good quality seafood is available in Australia today. However, seafood is a very perishable food, so take great care when buying it. When selecting pre-packed seafood of any kind, check the ‘packed’ date.

The main types of seafood are fish and shellfish. There are two types of fish:
• white fish, such as haddock, whiting and cod
• oily fish, such as herrings, sardines and salmon.

Choosing fresh fruits
The fruit you choose depends on whether you want to preserve it, cook it immediately or eat it raw. But as a general rule, fruit should be:
• a bright colour, typical of that fruit
• free from cuts and bruises
• the correct degree of ripeness (Buy bananas slightly green if they are to be kept for a few days, or buy a soft ripe avocado for tonight’s salad.)
• clean
• free from visible mould, decay and dark spots on the skin
• plump, not dehydrated.

Sometimes wax is sprayed on fruit to help it keep in cold storage and to give the fruit a shiny surface that is more appealing to the customer.

Choosing fresh vegetables
The choice of vegetable depends on what you are going to do with it. However, vegetables should be:
• generally uniform in size
• firm to the touch
• an appropriate colour for the vegetable (The darker the colour of green or orange vegetables, the higher the vitamin and mineral content is.)
• free from visible mould, decay, cuts and bruises
• exhibiting the appropriate turgor. (Leafy vegetables should not be brown around the edges or limp.)

Choosing frozen foods
When selecting frozen foods, look for:
• packaging that has no cuts or tears
• a reasonable use-by date
• no build-up of frost on the outside of the package
• no crushed edges
no dried spots visible through the packaging, which could indicate freezer burn
movement of small foods within their package. If the food is a solid block, it may mean the food has been allowed to thaw and refreeze.
storage below the freezer line in open freezers. If the food is above the storage line of the freezer, the temperature will not be low enough to prevent partial thawing. When the food is refrozen at home, more damage will be done, as more crystals form and more liquid is lost from cells.

REVIEW QUESTIONS

Remember
1. Make a list of the factors that influence a consumer’s decision to put a food product in their supermarket trolley.

Apply
2. Would you buy any of the food items described below? Give reasons for your answer.
   a) The fish looked a bit slimy and the eyes were missing.
   b) The meat was a dark brown colour.
   c) There was no use-by date on the fish.

Do an activity
3. Visit a supermarket and describe how the store design and layout of food appeals to consumer senses.

Layout of food for visual appeal

Food presentation describes how food is arranged, decorated and garnished on plates, platters, trolleys, and buffet or smorgasbord tables. When a person chooses and eats food, all the senses are operating, so it is important when preparing food to keep the presentation in mind.

The most successful cooks realise the importance of presentation and spend much time on suitable garnishes, the arrangement of food on serving dishes, and the table decorations.

You might ask why food presentation is important at all. If people are hungry, they will eat whatever is put in front of them. But food should look good as well as just filling the stomach.

Plate presentation

The visual appeal of a meal can be enhanced by taking care in plating and serving. Here are some handy hints.
1. Use good quality plates that are not chipped or cracked.
   Damaged plates can be unsightly and may harbour undesirable micro-organisms in the cracks.
2. Plate food neatly so that colours, textures and flavours are coordinated.
3. Don’t overcrowd the plate and have food spilling out to its rim.
4. Avoid stacking food so high it topples over before it reaches your guest.
5. Don’t smother food in sauce. Try using a squeeze bottle so you can control the amount of sauce you add.
6. Use a garnish only if it improves the appearance of the meal.
7. After plating the food, make sure that the plate edges are clean and do not have fingermarks, drips or crumbs of food.
8. Serve a portion size appropriate to the person who is to eat the meal.

Some think that plating food is an art. Simplicity often works best.

Garnishes

Garnishing refers to the trimmings applied to a savoury dish to improve its appearance — for example, a sprig of parsley added to the side of a roast chicken platter or radishes cut into roses for the top of a salad. Decorating usually refers to the brightening up and enhancing of pastries and sweets by using interesting shapes and contrasting colours and/or textures — for example, decorating the top of a pavlova with strawberries, kiwifruit and whipped cream. For convenience we will use the word ‘garnish’ to represent both processes.
Garnishes are used for one or more of the following reasons:

- to add a focus of interest
- to add colour
- to add contrasting textures
- to add contrasting shapes
- to show the ingredients used in the dish — for example, a lemon wedge served with a fish casserole helps to identify the dish
- to add a theme.

Garnishes can be used to good effect but it is often wise to keep them simple. A sprig of parsley can look more sophisticated than an elaborate garnish.

A little extra time and effort spent decorating food can turn the already attractive meal into an experience to remember — a visual masterpiece. Garnishes can brighten up even the most basic of meals.

Garnishes are made using either raw or cooked food. (Most fruits and vegetables can be used as garnishes for a variety of dishes.) Foods can be:

- sliced — smoothly (lengthwise, crosswise, wedges) or crinkled (fanned, spiralled, twisted)
- shredded — julienne, thinly
- scored
- curled
- piped through a bag
- carved or turned.

Like any form of decoration, garnishes should be used in moderation. Too many different types used on the same plate will look messy.

Several classic garnishes are easy to do and will liven up a meal: butter curls, dashes of paprika, pieces of parsley and grated cheese, for example, on savoury food, and a sprinkle of icing sugar, whipped cream roses, and curls of chocolate (caraque) on sweets.

Practise making some of the garnishes mentioned below in table 4.4, using a flex knife or sharp paring knife. Remember to wash the vegetable or fruit before turning it into a garnish, because people often eat garnishes!

**Food styling**

A food stylist has the task of creating pictures and moods with foods that are on display. The display may be for an actual function, such as a buffet, or for photography. The food stylist may be a trained chef or a person who has worked with food and has a lot of creative ability. The stylist does not usually make the food to be displayed, but decorates or arranges it so it looks appealing.

The food stylist works with a theme in mind. A stylist preparing a display for the Heart Foundation, for instance, would have to consider the low-fat approach when selecting and arranging food. Obviously, a trim lamb dish would not be served with a rich bernaise sauce for such a client.

In general, there are three tasks for the food stylist. First, keeping the theme in mind, all of the pieces necessary for the table setting are collected and arranged. This can include:

- a tablecloth or mats, and napkins
- table decorations that reflect the theme of the presentation

**Table 4.4 Garnishes and the foods they decorate**

<table>
<thead>
<tr>
<th>FOOD TO BE GARNISHED</th>
<th>INTERESTING GARNISHES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Savoury salads</td>
<td>Edible flowers such as pansies and nasturtiums, croutons, whole or chopped nuts, olives, hard-boiled eggs, cooked prawns, sundried vegetables such as capsicum and eggplant</td>
</tr>
<tr>
<td>Fruit desserts and salads</td>
<td>Unsalted nuts, cooked citrus peel, mandarin or orange segments, flaked chocolate, puréed berries such as strawberries and blueberries</td>
</tr>
<tr>
<td>Meat dishes</td>
<td>Dried tomatoes, hard-boiled eggs, green or pink peppercorns, carrots, sprigs of herbs such as rosemary and watercress</td>
</tr>
<tr>
<td>Seafood</td>
<td>Avocado wedges, chives and parsley, olives, lemon wedges</td>
</tr>
<tr>
<td>Poultry</td>
<td>Whole or puréed fruits, carrots, cooked citrus peel, mandarins or oranges, green or pink peppercorns</td>
</tr>
</tbody>
</table>
plates, bowls and serving dishes
serving utensils, such as spoons and tongs
cutlery and glassware.

All of these items are hired, bought or perhaps loaned by the manufacturer. As you can imagine, this collection takes a lot of time to organise, and good contacts are needed.

The second task of the food stylist is to decorate the food to be presented. This could involve piping whipped cream on a cake or combining two different coloured soups in a swirled pattern in a soup terrine.

The third task of the stylist is to arrange the food on or in the dish in an attractive manner. Garnishes are important in this task.

CASE STUDY

FOOD FASHION

Stylists can present food that looks good, even if its taste doesn’t match its looks. Bridie Smith reports.

When Pamela Stevens prepares a roast chicken, she needs about half a litre of dishwashing liquid and a couple of packets of Chux wipes. And that’s before the washing up.

These kitchen staples — along with blowtorches, paint brushes and tampons — are among the tools food stylists and photographers use to create the mouth-watering images that adorn food packaging in supermarket fridges, freezers and shelves.

Stevens, a Melbourne food stylist and corporate chef, has been in the business for 10 years. She can transform a pasty-coloured chook with pimply skin into
Food photography

Job opportunities for food stylists occur mainly in situations where food is to be photographed, such as in the production of cookbooks, magazines, posters and television advertisements.

Television advertisements sometimes present food in ways that can be achieved only using special effects. We know we could not get cooked rice to take the shape of a rack of lamb without the use of hairspray and glue, but it is a catchy gimmick. The television advertisements are designed to gain our attention and encourage us to buy a certain product, not always to show us what a finished product actually looks like. This is the task of the cookbook.

Publishers of cookbooks and magazines realise they have to show pictures of food that can be made and eaten in the home. While we can never hope to match the art of the food stylist, we can present a close approximation of food from a photograph. If we take the time to wipe the drops of sauce off the plate, to brush dried-out parts of the food with oil, or to spray wilted food with water, our food presentation will certainly improve.

Food photography requires special skills and equipment, as well as considerable patience.

With digital photography, the effect of a food display can be viewed within minutes. Most food photographers work with an SLR digital camera, zoom lens, computer software, such as Adobe Photoshop CS2, and a laptop computer. With digital photography, an unsightly blemish or bruise on a food can be edited out.

As with any photography, lighting is very important. The food should be evenly lit from the sides and top. If an undesirable shadow appears (on the inside of a pie that has gone), a mirror can be used to focus light on the shadowed area. This creates a three-dimensional feel or depth.

Food photography these days is about simplicity and freshness. Donna Hays has been the trend setter in this area with white plates and single dishes that are not overcrowded with food. The food just looks crisp and fresh with the minimum of fuss. Colour in food photography may be added with the props, such as placemats, glasses or napkins.

Several general rules when photographing food include the following.
Control the colour of the food.

- Bright colours indicate the freshness of the food — for example, dark green broccoli with no yellow patches, and bright red tomatoes with no brown spots or blemishes.
- Colours should contrast — for example, light and dark, patterns and plain, subtle colours for softer foods and bright colours in turgid foods.
- Cooked food looks darker and overcooked, so only partly cook the food to be photographed.

Make hot food look ‘hot’ or cold food look ‘cold’.

- Put partly cooked food about to be photographed into the microwave on high for 30 seconds to produce steam.
- To make a food appear golden brown, brush the surface of the food with paprika and brown food colouring, or brush with oil or a sugar and water syrup.
- To make food look chilled, spray cold water on its surface.
- To photograph a cold drink, place ice cubes in the container then spray the outside with a fine mist of water until the drops roll down the glass. Plastic ice cubes may be used to avoid having to replace melted cubes.

Make the food look ‘life sized’. (Cameras tend to flatten food)

- Use different heights in the plates, bowls and serving dishes.
- Cut or make food pieces larger than you normally would — for example, make large, uneven-sized biscuits.

CASE STUDY

by JOHN NEWTON

Dots, dashes, stacks and garnishes. To some chefs, presentation is a food fad. To others, it’s an art form.

Plating — how food is presented to the diner — has been a universal preoccupation of chefs. They know that how food looks is, if not as important as its taste and smell, then well worth fussing over. And fuss they do.

‘I hate patterned plates’, says Peter Gilmore of Quay. ‘I hate brightly coloured plates. The only thing I’d consider other than white is Japanese ceramic.’

Just as there are fads in ingredients — from sun-dried tomatoes to truffle oil — so there are in how those ingredients appear. Think dots and dashes, froths and foams, the kiwifruit garnish, the stack and the turned vegetable. An anything-goes approach currently reigns, which is another way of saying there’s no way of telling what your food’s going to look like when you’re eating out.

If there are no rules, then there are schools, represented by the French food-as-fashion approach at one end of the spectrum and the Japanese seasonal and minimal style at the other.

For some, the plate is the canvas, the food the medium. The resultant work of art should create involuntary gasps of admiration as it’s set down in front of the diner. For others, the plate is the flat thing that carries food to the table so the customer can eat it.

Gilmore sits at the artistic end of the spectrum. His plating might be described as geometric but, he says, ‘I’ve edged away from being so strict. ’

‘A lot of my dishes are a bit more free form — but still precise. ’

‘I love textures and flavours. I love people to look at something that is elegant and beautiful on the plate. The idea of form comes first — there are textures and flavours I want to achieve — then comes how I want to fit those ideas onto a plate.’

In the other corner is Icebergs’ Robert Marchetti. ‘I did about six years on the floor’, he says, ‘so the last thing I think of is how the food looks. The first thing is how it tastes. Then how it goes on the plate. When my staff ask me, “How do we plate it?” I ask them, “How do you eat it?”’

‘I don’t get [when] you get a pasta bowl and there’s a steak in it. You put a fork on the side and it slides into the bowl. I’ll change the plating of a dish if I find it awkward to eat. The other day I did a squid ink risotto and I put it on a big plate so you don’t get it all over yourself. I don’t do aesthetic food. I’m a humble wog, so my food’s a bit daggy.’

There is an old joke: what’s the difference between Sydney and Melbourne restaurants? Answer: about 6 centimetres. Stacking began in the ‘80s and continued through to the ‘90s and just occasionally you’ll still see tall food being served.

Stacking heads the list of no-nos for Tony Bilson (of Bilson’s). ‘It comes out of hamburger culture’, he sneers. ‘It’s an American invention and it’s silly.’

Bilson says that a lot of the decoration on a plate is culturally based. For example, ‘There are two reasons we turn vegetables — one is to reduce the original to bite-sized and the second is to display kitchen skills, highly regarded by the French. Another example would be the use of pineapple and glacé cherries on Chinese plates — the colours represent good luck.’

The ‘60s

Heavy brown Arabia ware plates to match huge helpings of brown glazed food napped (that was the word) with heavily reduced sauces. Prawn tails swooped out of parfait glasses.

The ‘70s

Newvelle Cuisine explodes in France, given impetus by the publication in 1977
of The Nouvelle Cuisine of Jean and Pierre Troisgros, which alerted Australian chefs to this new way of cooking. Meanwhile, plates here were patterned Limoges, portions still generous, vegetables were turned for garnishes or departed the plate to be served separately. Duck breasts were first fanned.

The ‘80s
Along with Nouvelle Cuisine, the virginal white plate entered the scene — reigning supreme (at least in Australia) ever since. This new style whipped local Francophile chefs into a frenzy of invention and decoration. As the decade progressed, plates expanded and servings shrank. Nouvelle Cuisine emerged as Cuisine Mean. Proliferation of the kiwifruit garnish. Until about ’86, food was often scored and striped from the grill or barbecue.

The ‘90s
The stack hit and food shot skywards. Dots and dashes appeared (tales are told of dishes taking 5 minutes to dress before arriving at table, tepid). Mid-decade, foams and froths roll in from Spain and France. Counter to all this frippery, the first glimmerings of the real food revolution appeared. Vogue food director Joan Campbell’s no-nonsense plating style (‘just bung it on’) influences British chefs such as Jamie Oliver.

Today
Anything goes. The return of real food means a more casual attitude or a lot more individual artistic expression that won’t be dictated to.


OUTCOME TASK

Students learn to:
• select appropriate equipment and utensils to produce quality food products across a range of settings
• implement safe and hygienic work practices when handling food
• select and apply suitable preparation methods to produce quality food products and plate meals for service across a range of settings
• style foods for photography.

Contributes to the following outcomes:
• selects appropriate equipment, applies suitable techniques and utilises safe and hygienic practices when handling food
• applies an understanding of the sensory characteristics and functional properties of food to the preparation of food products.

Carefully consider the article above. Remember that this is not just a comprehension task; use the stimulus material along with your knowledge of food preparation and presentation to complete the tasks ahead.

1. What is current thinking with regard to plating food attractively? Are there strict rules to adhere to?
2. Describe at least three different techniques of plating food.
3. Draw a timeline that depicts ‘plating fashion’ from the 1960s to the present day. You may want to either describe the fashion or draw it.
4. Your school’s food technology department probably has few resources available to assist in the presentation of visually appealing food. The number and variety of serving dishes and platters is probably limited. The dinnerware is usually a basic solid white, yellow or green colour, and the cutlery is of various sizes and designs. Work in pairs or groups of three (depending on the kitchen space available) to:
   a) design and prepare a two- or three-course menu that can be made in two lessons as close together in the week as possible
   b) present the food using only the preparation and serving resources of the school
   c) photograph the finished product.

Below are some guidelines to help you plan the activity.

Choice of food for the menu
1. Your teacher will tell you the budget. (Remember that foods out of season will be expensive.)
2. Keep in mind the length of the lesson. Foods that take longer to prepare than the lesson-time cannot be included.
3. Consider the cooking experience of each person in the group. Giving a beginner a complicated dish to make is not good use of resources.
4. Choose dishes you already know how to make, because this will save time.
5. Remember the importance of garnishes.

Planning your time
1. Plan your time carefully so all the courses will be ready for serving at the same time.
2. Include time for arranging the food and making garnishes.

FOOD PREPARATION AND PRESENTATION EXERCISE
The messages sent to our brains when eating food determine whether the experience is enjoyable.

Our enjoyment of food is based on the sensory properties of food; the senses are smell, sight, hearing, touch and taste (including mouth feel).

In all aspects of food preparation, cooking and serving, it is essential to activate all the senses associated with the enjoyment of eating.

Tasting and evaluating food can be based on subjective and objective judgements.

Sensory evaluation uses subjective tests such as hedonic scales, descriptive words, ranking, preferences, profiling and difference testing.

Good quality ingredients and appropriate cooking methods contribute to the overall quality of a meal.

The presentation of the food is important to enhance food acceptability.

**KEY TERMS**

- astringency
- crustacean
- descriptive tests
- descriptive words
- difference testing
- duo-trio test
- flavour
- food profile
- food stylist
- garnishing
- hedonic scale
- marbling
- mouth feel
- paired test
- pH
- profiling
- ranking
- sensory analysis
- subjective evaluation
- triangular test
- turgor
- two-out-of five test
- umami
- viscosity