



Course Companion

for Eduqas GCSE Food Preparation and
Nutrition: Cooking and Food Preparation
(Food Choice)

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Teacher's Introduction

This resource is designed to meet the Cooking and Food Preparation (Area 6: Food choice) element of the Eduqas GCSE Food Preparation and Nutrition qualification. Preparation, cooking techniques, and developing recipes and meals are practical led and are covered throughout all course companions.

What it covers

The resource comprises three chapters covering the following:

Chapter 1: Sensory properties	Chapter 2: Factors affecting food choice	Chapter 3: Food labelling and marketing influences
<ul style="list-style-type: none">• The sensory perception of food• Sensory testing methods• Taste panels	<ul style="list-style-type: none">• Factors which influence food choice• Food choices	<ul style="list-style-type: none">• Food labelling• Food marketing

How to use this resource

The resource covers all aspects of food safety and is designed to increase knowledge of the topic and enable learners to test their understanding and skills through a variety of assessment methods.

Learning Outcomes enable the learner to clearly see what they are expected to know at the end of each chapter.

The **Overview** provides a brief summary of what will be covered in the chapter and the **Key Terms** list provides information on key terms within the resource (key terms are emboldened within the chapter text).

Did you know?	These boxes contain handy tips.
Things to think about	These boxes provide learners with a chance to develop cognitive skills, do some research (books, Internet, people) and take part in a discussion.
Apply	These boxes provide the learner with the opportunity to further their skills, either through cognitive or practical application.
Qs	These test learners' knowledge and understanding through quick Y/N questions.
Skills	Based on the suggested application of skills section of the Eduqas GCSE Food Preparation specification, these test learners' food safety skills through practical application.
Study Tip	Useful tips to help the learner concentrate on important aspects of the text that may appear in the final assessment.
Check your understanding	Multiple-choice, short-answer and extended-answer questions appear at the end of each section to test knowledge and develop understanding.
Quiz-ine	A crossword-style quiz at the end of each chapter to test learners' understanding of key terms used in the resource. The shaded squares spell out a word associated with the chapter text.
Answers	Answers to questions are provided at the end of the resource.

M Golebiowska, March 2018

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Chapter 1: Sensory perception

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Overview

In this chapter we will look at sensory testing methods and how our taste buds work when tasting food. We will look at the importance of senses and how they influence our food choices. We will look at sight, taste, touch and aroma. We will explore the different sensory testing methods, including preference tests and grading tests, and setting up a taste panel.

Learning outcomes

After studying this chapter you should be able to:

- ☐ understand and describe the importance of senses and how they influence food choice
- ☐ describe the different sensory testing methods
- ☐ explain how to set up a taste panel
- ☐ understand that controlled conditions are important
- ☐ be able to use sensory testing methods

Key Terms

Appetising:

Tasty: smells and looks nice, and encourages a person to eat (stimulates the appetite)

Controlled conditions:

Conditions, such as lighting, aroma, sound, that are controlled during a test to ensure that it is conducted fairly and without bias

Discrimination tests:

Tests that are used to detect differences between two products

Hedonic scale:

A nine point scale used within preference tests to measure how much a product is liked or disliked

Objective:

Factual, unbiased and not based on opinion

Olfactory/olfaction:

Relating to our sense of smell

Palate:

This refers to the sensitivity of an individual's sense of taste to identify different flavours

Preference test:

A test based on an individual's food preference to determine if they like or dislike a product

Sensory:

Relating to the five human senses (sight, hearing, touch, taste and smell)

Subjective:

Based on personal opinion or taste

Taste panel:

A group of testers comprising people who match specific criteria such as age, gender, ethnicity to target a specific consumer group

Taste receptors:

Taste buds on our tongues which help us to detect different flavours

Umami:

A savoury taste

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Sensory evaluation

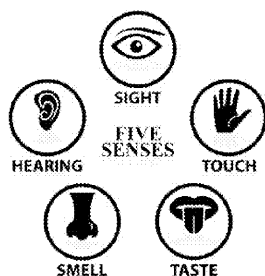
Sensory evaluation of food is an important tool which can be used by food manufacturers etc. It is used to compare and detect differences between products, analyse food responses and preferences of future consumers. Most importantly, it is used to ensure products are accepted and successful in the market. In this chapter you will learn how our senses work and how to set up a taste panel to obtain reliable results.

The sensory perception of food

Characteristics of food which can be detected with the senses are called organoleptic properties. Senses in a different way depending on whether the food is raw or cooked, fresh or stale. In the course, you will learn how various preparation and cooking methods affect the taste, colour and appearance of food. As you will discover how our senses help us to make food choices.

The human tongue (and the whole mouth, although less so) contains **taste receptors** which help us to detect bitter, sour, salty, sweet or savoury tastes. Taste buds help us to taste and influence our food choices through our food preferences (what we like or dislike).

Humans have five basic tastes – sweet, sour, bitter, salty and **umami** (a savoury taste meaning pleasantly savoury tasting) – which enable us to develop likes and dislikes. These are important to us so that we can determine differences in taste, appearance, texture and smell.



Humans have five main senses – we use them to evaluate our food. We can see the colour of food, touch the *texture* or firmness of food, taste whether the food is sour, bitter, sweet or savoury and *smell* the aroma of food. We use *hearing* to detect sounds, e.g. when a fruit is crisp or apple.

How the senses help us make food choices

The smell of food may be **appetising** to us and make us want to eat it or be off-putting and make us reluctant to taste it. Our sense of smell is called our **olfactory** sense (sense of smell is **olfaction**) and it is capable of detecting over 10,000 different smells. Our olfactory system influences our food preferences. Food smells (in the form of tiny molecules undetectable to the human eye) reach the scent receptors in the nose; the olfactory system transmits the signals received to the back of the nose and on to the brain where we then react to the smell by finding it appetising or unappetising. We sniff so that more molecules can be detected.

Did you know?

Tiny hair-like cilia are attached to scent receptors and act as filters help to trap pollen and dust in the nose before it reaches the lungs.



Various cooking methods help to alter and enhance the smell of food both by evaporation of water and by adding oils. You can notice that hot foods smell more intense because in hot food the molecules move more easily. That's why bread dough doesn't smell as strong as baked bread fills the whole house with its smell.

Our sense of taste determines the types of food we like. Some people prefer sweet, sugary foods (have a 'sweet tooth'), while others prefer salty or bitter foods. While some people can tolerate bitter or sour tastes, some people cannot.

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bitter compound which also occurs in cabbages, broccoli and kale and other cruciferous vegetables are from the cabbage family). Some people can detect the bitter taste and others are not aware of it. As you eat, the food becomes dissolved in saliva. This makes it easier for the taste buds to reach the taste buds, which send an appropriate signal to the brain, which helps you to decide whether you want to eat it.

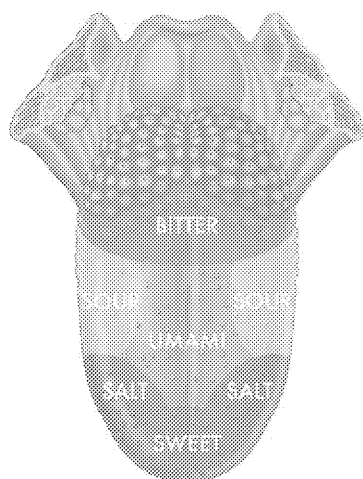
Texture can also be a deciding factor in whether we find food **appetising** or not. Texture can be affected by the way food is cooked; for example, frying helps to make food more appealing, while boiling is lacking when you boil food. The texture of some foods can be unappetising and some people cannot tolerate rice cakes or mushrooms. Overcooking food affects the texture and can make it unappetising. Texture can also be detected by the sense of hearing – by hearing that a food is crisp or freshly made, and that also helps us make decision about whether we want to eat it.

The appearance of food can influence our food choices. A food *looks* unappetising regardless of texture or aroma. During cooking, the appearance of food can change. For example, meat becomes brown and becomes sponge-like, but spinach leaves will shrink and become limp. Your own appearance also influences taste – regional dishes such as haggis from Scotland or jellied eels are an 'acquired' taste because of their texture, appearance and taste.



Things to think about

Discuss why a blocked nose affects our sense of taste.



Your tongue can recognise five basic tastes. The taste buds which send the electric impulses to your brain are located all around your mouth, with the highest concentration of them located on the tongue.

Research

Look up three food ingredients that are associated with a particular region (e.g. Italy).



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Sensory testing methods

Sensory testing is about evaluating a range of food using taste, texture, appearance and smell. Preparing or cooking enables us to determine whether it needs to be sweetened (or salted). Not everyone shares the same sense of taste and some people prefer a salty way, some people prefer spicy food while others prefer milder tastes. To evaluate sensory testing methods, including the preference tests described in the table below.

Preference Tests	
Paired preference	Preference tests are used within consumer marketing to determine if a group of consumers prefers a certain food product compared to another. A manufacturer to see if a new product will be successful. Because a large number of samples are required for this method, it is time-consuming and costly. In a paired preference test, a tester is given two samples and is required to indicate their preference for one over the other.
Hedonic	The hedonic scale is used in order to rate how much a person likes a product on a sliding scale of like extremely to like slightly. It is sometimes referred to as a likeability test.

There is also a wide range of other sensory testing methods used in the food industry, which are useful when designing new food products, and comparing them against other products.

Discrimination Tests	
Triangle	This test involves three samples: two of the same sample and one different. The tester must try and identify the different sample (odd one out).
Grading Tests	
Ranking	This type of test attempts to detect differences in similar products. For example, is this product sweeter than another product? The tester must sort the products by sweetness, starting with the sweetest and ending with the least sweet.
Rating	Rating tests are used to compare characteristics between two products. For example, testing whether a reduced-sugar product tastes as good as a full-sugar product. The tester uses a scale starting at 1 (like) to 5 (dislike).
Profiling	A profiling test is also referred to as a star test and is used to identify the characteristics of a product using, for example, a five-point scale for each characteristic.

Did you know?

Subjective means that the result is based on an individual's opinion or taste.

Objective means factual, with the result not being based on personal feelings.

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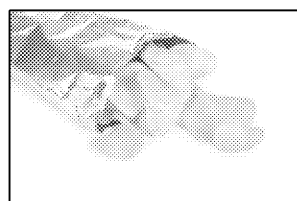


Preference Tests

Preference tests are used to find out which product a panel of testers prefer / like **subjective**.

Paired Preference Tests

In the following test, a tester is required to indicate which of the products they prefer based on their personal taste and opinion (subjective).



Sample 1

Score: 9



Score: 4

These products are salted potato crisps. Testers indicate their preference for each product on the hedonic scale.

Hedonic Scale

The nine-point hedonic scale is used to determine the *likeability* of a product.

Nine-point Hedonic Scale

- 9 Like extremely
- 8 Like very much
- 7 Like moderately
- 6 Like slightly
- 5 Neither like nor dislike
- 4 Dislike slightly
- 3 Dislike moderately
- 2 Dislike very much
- 1 Dislike extremely

In the above test, the sample 1 (9 = Like extremely) and sample 2 (4 = Dislike slightly).

Preference tests are subjective tests that measure a consumer's preference for a product. A preference test is a test in which the tester is asked to indicate which product they prefer / like.

Discrimination Tests

Discrimination tests are **objective** tests which are used to detect and identify differences between food products.

Triangle tests use three samples – two of which are the same product and one of which is different or the 'odd one out'. Out of the three samples, the tester must decide which sample exhibits an overall difference compared to the other two samples. In the example on the right, samples A and C are the same product, sample B is the odd one out. The tester must identify whether sample B tastes significantly different.



Sample B ✓

In this test, the tester has detected a difference in taste in sample B due to the low fat content.

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Grading Tests

Grading tests use *ranking*, *rating* and *profiling* methods. These tests are **objective** and **reliable**. For example, ready-salted crisps are being tested and then ranked in order of saltiness.

Sample C



1st: saltiest

Sample A



2nd: salty

Sample D



3rd: slightly salty

Ranking – order of specific characteristics of similar products (which is sweeter, which is crunchier, etc.). In the test, sample C is the saltiest and sample D is the least salty.

Rating – how do you rate this product in terms of the specified characteristics? In the following test, four packets of crisps are rated using scores for taste, crunchiness, and appearance.

Characteristic	Score (out of 4)			
	A	B	C	D
Saltiness	4	1	4	2
Crunchiness	2	1	3	1
Appearance	2	1	3	4

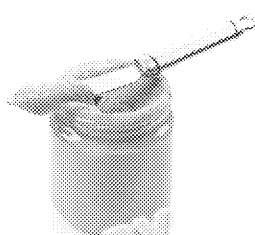
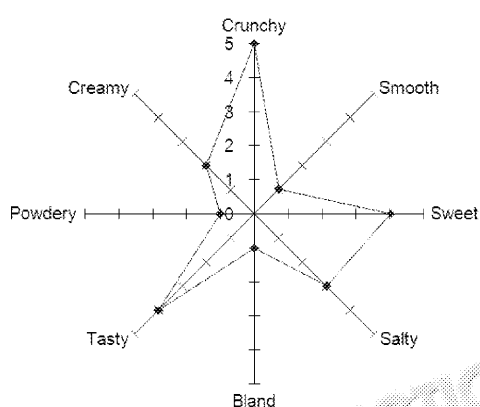
In this test, the scores for the four samples are as follows:

Saltiness scores: 1 = Just enough salt, 2 = Slightly too salty, 3 = Too much salt, 4 = Too salty

Crunchiness scores: 1 = Good, crunchy texture, 2 = Only slightly crunchy, 3 = Too crunchy, 4 = Too soft

Appearance: 1 = Consistent golden appearance, 2 = Appearance OK but inconsistent, 3 = Appearance not OK, 4 = Appearance very poor

Profiling is used to evaluate the characteristics of a product using a five-point scale. For example, a jar of crunchy peanut butter is tested using a five-point scale for the intensity of each characteristic (crunchiness, sweetness, tastiness, etc.).



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How to set up a tasting panel

The type of **taste panel** used will depend largely on the target consumer, e.g. age, gender, ethnicity, income bracket and leisure pursuits. For example, a product aimed at retired consumers would use a taste panel comprising testers of this age group, and a product aimed at toddlers would comprise a taste panel of young mothers. Some food products are targeted at consumers who are interested in fitness and health, such as energy bars or protein drinks, and so the taste panel would comprise testers with the same interests. A tester is usually a typical example of the intended consumer of the product (e.g. a vegetarian wouldn't be asked to test a meat product). Usually has good 'taste buds' with the ability to detect subtle differences in the taste of food. A style food that is targeted at a typical British consumer, such as curry, may not be suitable for Indian curries, and the testing panel will reflect this by using typical potential consumers.

Controlled Conditions

Controlled conditions ensure that the tests are reliable and credible. Conditions include lighting, temperature and sound controls.

- The room temperature is controlled so that the testers are not too cold or too hot so they can focus on the task at hand.
- Sometimes lighting is controlled in order to disguise the appearance of food.
- Quiet conditions, usually booths, are used with no smells to distract the testers.
- Glasses of water are provided to sip between tastes (to cleanse the **palate**).
- In some tests, testers are required to wear blindfolds so as not to be distracted by the appearance of the food.

Test sheets for testers to record their results are supplied.

It is also very important to properly prepare the food samples. When preparing a

- use food samples of roughly the same size
- serve food samples on the same type and size of crockery – it is best to use white crockery
- serve food samples at the correct temperatures – e.g. ice creams should be served cold, soups should be served warm
- use a food carrier which is neutral in taste, if one is needed; unsalted rice cakes are a good choice
- code your samples with random numbers rather than simply naming them so that the tester doesn't know what sample is which

Did you know?

Food carriers are used to serve foods which can't usually be eaten on their own, e.g. soups, sauces, fillings or pastes.



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The sensory qualities of food

When describing a food sample, you can't just say that it is good or bad. This doesn't really say much about the food and simply shows your subjective preference towards the food. Rather than using generic terms, you should try to find words which describe the sensory qualities of food accurately and in detail.

The table below shows only some of the words you can use when describing various foods. Can you think of any others?

Aroma	<i>Aromatic, floral, pungent, perfumed, acrid, smoky, fragrant, bland, fishy</i>
Texture	<i>Brittle, rubbery, close, smooth, sticky, tender, soft, gritty, chewy, moist</i>
Taste	<i>Sweet, salty, zesty, tart, citrus, spicy, weak, savoury, rich, cheesy, milky, buttery</i>
Appearance	<i>Heavy, flat, fizzy, open, coarse, firm, flaky, lumpy, mushy, runny, thick, burnt, blackened, golden</i>

Skills

1. Prepare a basil-flavoured oil to be used with Mediterranean roasted vegetables and a lemon-flavoured oil to use with a stir-fry.
2. Set up a taste panel for a preference test that will test your oils.



Things to think about

Discuss why controlled conditions for taste panels are important.

Apply

1. Prepare two similar samples of food (one must be sweeter, saltier or different). Ask a friend to indicate their preference using the hedonic scale.
2. Prepare one sample of food and try to assess it using the profiling test. How that food can be assessed?


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Check your understanding: Sensory

1. Which of the following statements is CORRECT about preference tests?
 - a. They are tests to judge characteristics of food.
 - b. They are tests to see whether a consumer likes or dislikes food.
 - c. They are tests to place food in a particular order.
 - d. They are tests that use a triangle.
2. Which of the following statements is TRUE about setting up a sensory test?
 - a. The tests must be conducted under controlled conditions.
 - b. The tests must be conducted in a test kitchen at home.
 - c. The tests can only be conducted by an experienced tester.
 - d. The tests are conducted under the same conditions for every test.
3. Which of the following refers to olfaction? (1 mark)

 a. Sense of hearing	<input type="checkbox"/>	c. Sense of touch	<input type="checkbox"/>
b. Sense of smell	<input type="checkbox"/>	d. Sense of taste	<input type="checkbox"/>
4. Which of the following words describes a result which is based on an opinion? (1 mark)

a. Objective	<input type="checkbox"/>	c. Injective	<input type="checkbox"/>
b. Subjective	<input type="checkbox"/>	d. Projective	<input type="checkbox"/>
5. State two qualities of cooked onion. (2 marks)
 1.
 2.
6. Describe how to set up a taste panel for a preference test of muscle-broth drinks. (6 marks)

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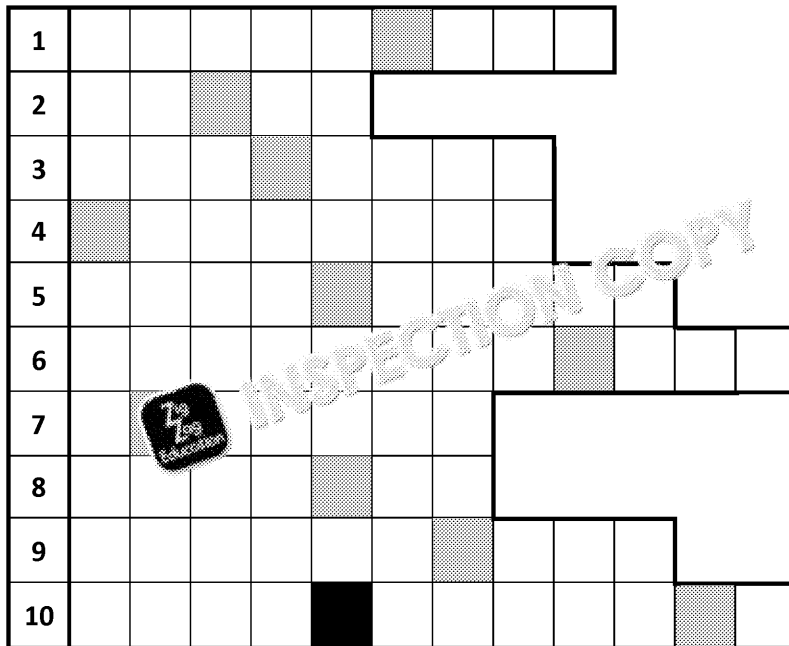
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Chapter 1: Quiz-ine

Fill in the answers to the questions below to reveal a word relevant to sensory perception (the black squares are spaces between words).



1. Sensory system used to detect aromas (9)
2. The savoury taste characteristic of meat and cheese (5)
3. One of the five senses, used to assess the appearance of food (8)
4. Discrimination sensory test used to detect differences and indicate the odd one out (10)
5. Based on individual opinion (10)
6. Characteristic of food which affects the sensory organs (12)
7. Sensory testing method which puts food samples in an order (7)
8. Scale used to assess how much a person likes or dislikes a food (7)
9. Sensory testing method which uses the scale from point 8 (10)
10. Chart which displays various characteristics of a food product (4, 7)

The shaded squares reveal these words:

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Chapter 2: Factors affecting food choice

Overview

In this chapter we will look at the factors that influence food choice such as physical activity, occasion, costs, preference, availability, lifestyle, seasons and the time available to prepare and cook food. This chapter also explores how food choice may be connected to religious, ethical and moral beliefs or to food intolerances.

Learning outcomes

After studying this chapter you should be able to do the following:

- ☐ understand and describe the factors that may influence food choice
- ☐ understand and describe how religious, ethical and moral beliefs can affect food choice
- ☐ understand and describe how food intolerances can affect food choice
- ☐ identify allergenic ingredients
- ☐ list mandatory information which must be included on food labels
- ☐ list non-mandatory information which may be included on food labels
- ☐ interpret additional labelling
- ☐ understand how food marketing can influence food choice

Key Terms

Animal welfare:	Protecting an animal's mental and physical needs
Balanced diet:	A diet that meets the energy and nutrient needs of the body
BMI:	Body mass index indicates a healthy or unhealthy individual's weight (kg) by their height (in square metres)
BMR:	Basal metabolic rate refers to the rate at which energy is used by the body at rest
Calories:	Units for measuring the amount of energy provided by food to carry out daily activities
Ethical beliefs:	Behavioural rules relating to right or wrong in a particular context
Export:	Transporting and selling goods to another country
Fairtrade:	Trading between developed and developing countries to support local producers
Fasting:	A period of time without eating or eating only small amounts of food for religious or health reasons
Food allergies:	An allergic reaction to food involving the immune system
Food intolerance:	An adverse reaction to certain foods that involves the digestive system
Genetically modified (GM):	A process of artificially altering the DNA of genes of one organism to another
Levy:	A tax or charge imposed on companies such as sugar
Lifestyle:	The way in which an individual lives, eats and works
Moral beliefs:	Beliefs that determine what is right and what is wrong
Obesity:	Being over the weight recommended for a person of a particular height
Organic:	Food which has not been treated with any artificial chemicals
PAL:	Physical activity level to estimate energy expenditure
Seasonality:	The time of year in which food is grown/harvested
Sedentary:	Being inactive or sitting for long periods of time
Vegan:	Eating only plant food with no animal products in it
Vegetarian:	Excludes meat from diet, but does eat eggs and dairy

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Factors which influence food choice

There are many factors which may influence an individual's food choice. These may be health related, connected to a belief system, or be based on **animal welfare** issues or on income and/or lifestyle.

The lifestyle of a consumer will be reflected in their food choices and diet. For example, if a person leads an active life with plenty of strenuous activities, they will need to eat more food to sustain energy and endurance.

The range of factors affecting food choices

What we eat rarely depends on what we want to eat. More often, it is a result of many factors, including lifestyle factors, health, availability and affordability of food, social and cultural factors, and others. Some of the factors are presented in the table below.

Factor	Food Choice
PAL (physical activity level)	<p>The physical activity level (PAL) of an individual is used to measure energy expenditure over a 24-hour period and is expressed as a multiple of the basal metabolic rate. Food choices are influenced by showing how much energy has been expended and how much energy needs to be put back via food (without weight gain).</p> <p>People with sedentary lifestyles expend less energy</p>
Health	<p>Health can be a governing factor in food choice, either by avoiding certain foods because of specific health issues or by eating certain foods through a desire for a healthy and balanced lifestyle.</p> <p>A healthy diet is one with a variety of foods in the right proportions</p>
Occasions/celebrations	<p>Food choices are affected by occasions such as birthdays, weddings, and parties. Foods consumed during these occasions may differ from everyday habits (e.g. more sweet/sugary foods, snacks, alcohol).</p> <p>Some religious festivals, such as Ramadan, require abstaining from food and drink without food for a period of time for religious, medical or ethical reasons.</p>
Income/cost	<p>A person's income can influence their food choice and what they can afford to eat. A low-income consumer may eat fewer expensive foods and more cheaper processed foods compared to a high-income consumer. Cost is a prohibitive factor for some people.</p> <p>Processed meat can cause cancer according to the World Health Organization</p>
Preferences/enjoyment	<p>Preferences affect food choice. Some consumers prefer sweet foods, some prefer salty foods, and some consumers prefer savoury foods. Food preferences may be linked to culture, religion, or in food choice for some people. People who watch food programmes and eat a variety of foods are called <i>foodies</i>. People who are very selective about what they eat are called <i>gourmets</i>.</p> <p>Some people hate sprouts while others love them!</p>
Availability/seasonality	<p>Food availability can be influenced by transport, weather, and sanctions imposed on a country's ability to export food. These factors can affect the food choices of consumers. Seasonality is when a food is available only at certain times of the year, although in the UK, where we import from other countries.</p> <p>In 2015 in the UK there was a national shortage of British pork at the Bourneville factory in North East England.</p>

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Factor	Food Choice
Lifestyle / time of day / time available	Lifestyle can be a big factor in food choice. Some people may be able to eat meals at set meal times or have time to cook. A 2015 study by the University of Cardiff showed a link between eating breakfast and educational performance in the classroom.
Culture	The place where we grow up also can determine our food choices. From an early age we are exposed to foods and tastes from our country, region or even family. Later in life this can change as we are exposed to foods from other cultures, as our taste buds are not used to some foods that are too strange or unusual. People from Western European countries are unlikely to indulge in spicy food from Asian countries.

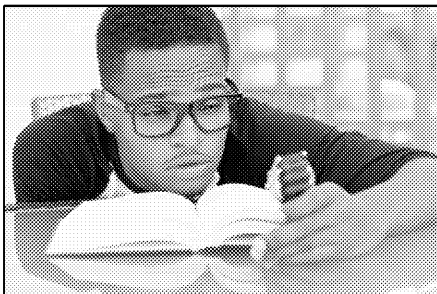


Physical Activity Level (PAL)

The PAL is calculated to work out energy consumption over a 24-hour period and is compared to the food energy requirements of active or inactive people. An individual's **BMR** (basal metabolic rate) is the number of calories that are burned off during rest.

Working Out Physical Activity Level

To know a person's PAL, you need to find out how active that person is. This is usually done through a questionnaire or survey, during which the individual answers a range of questions about their lifestyle, diet, etc. Although it might not be easy, you can usually assess a person's PAL using the following table:

Activity	PAL
Sedentary / light activity	1.3–1.5
Moderate activity	1.5–1.7
Vigorous activity	1.8–2.2

SEDENTARY	MODERATELY ACTIVE	
 <p>Jules avoids any active exercise at school, and when he comes home he sits in his bedroom and texts his friends, uses his computer for social media and plays computer games. Jules does not move much and prefers to sit for long periods rather than being physically active. This means Jules has a SEDENTARY lifestyle with a PAL of 1.3</p>	 <p>Ben walks two miles to college and then two miles back home every weekday. At the weekend he chills with his mates and is moderately active, although some time is spent sitting watching TV or using his phone to send pictures or Snapchatting to his mates. Ben is MODERATELY active with a PAL of 1.6.</p>	 <p>Tallu is a very active person and runs every day. Tallu is also a member of the school sports team and goes to the gym.</p>

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Basal Metabolic Rate (calories used while at rest)

The Harris–Benedict equation is used to work out BMR. **You don't need to memorise the equation.**

BMR male = $(10 \times \text{weight in kg}) + (6.25 \times \text{height in cm}) - (5 \times \text{age in years}) + 5$

BMR female = $(10 \times \text{weight in kg}) + (6.25 \times \text{height in cm}) - (5 \times \text{age in years}) - 161$

By multiplying a person's BMR by their PAL, you can obtain their TEE – Total Energy Expenditure. It is the amount of energy a person needs every day to lead their lifestyle and maintain their weight.

Scenario – Sian

Sian is a 50-year-old woman with a height of 5 feet 4 inches (1.6 m) and a weight of 54 kg. Sian works in an office and her job is moderately sedentary but she is reasonably fit, goes to the gym or walks briskly for an hour every evening. Sian's PAL is around 1.6.

Working out Sian's BMR and TEE (finding her BMR and PAL)

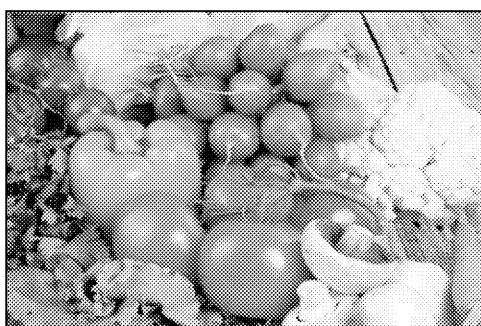
The PAL for a moderately active person is around 1.3 to 1.7 (we can use 1.6 for Sian). We can work out Sian's BMR using the Harris–Benedict equation above by calculating $(10 \times 54) + (6.25 \times 160) - (5 \times 50) - 161 = 1,129$. If we use the equation to work out Sian's TEE (BMR \times PAL), this results in 1,806 kcal as her TEE. **This equation uses Sian's weight in kilograms.**

Working out Sian's daily food energy requirements

A healthy diet should provide around 50% of energy from carbohydrates, up to 35% of energy from fat and 15% of energy from protein. This means that Sian should consume around 903 kcal from carbohydrates (that is equal to 240g), 630 kcal from fat (around 70 g) and 270 kcal from protein (67 g).

Healthy Eating

People may choose foods that benefit their health either as part of a healthy, **balanced diet** or because they have a specific health condition that prevents them eating certain foods or that necessitates them eating more of a certain food. For example, some people may need to cut out salt due to high blood pressure or catarrh, sugar due to high blood sugar levels or diabetes, wheat or milk due to intolerances or spicy foods due to a poor digestion. To help children stay healthy, healthy eating programmes are promoted and delivered within schools. There is a wealth of information available about healthy eating – magazines, newspapers, social media, books, TV programmes – and these can influence food choices. Some types of media will present articles about promises fantastic health and slimming results and, although the claims may contain some truth, they can lead to a poor understanding of diet and food.



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Childhood Obesity

Childhood **obesity** is a big problem in the UK, and the Government, as part of its obesity strategy (prompted by Jamie Oliver's campaign), has imposed a 'sugar tax' on soft drinks in order to curb unhealthy sugar intake in children. The Soft Drinks Industry Levy is referred to as the 'sugar tax' in the media. This levy, or tax, means that soft drink companies will pay a charge for drinks with added sugar or total sugar content of 10g or more per 100 millilitres. The revenue in England from these charges will be spent on programmes that encourage children to eat a balanced diet and be more physically active.

Did you know?

A five-year-old child should consume no more than 19 g of sugar per day, but a can of cola contains 35 g!

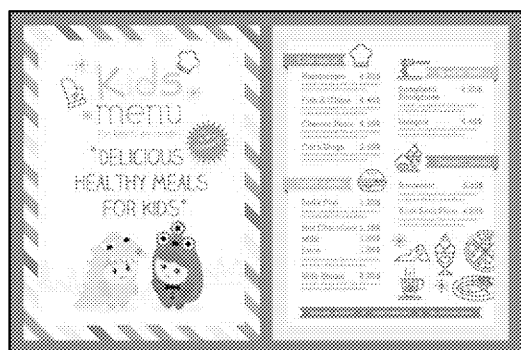


Research

Find out about Jamie Oliver's campaign in the UK and his fight to combat childhood obesity. <https://www.jamieoliver.com/food/childhood/54-jamie-plan>

Apply

The sugar tax is being introduced to lower sugar intake among the young. Think of a recipe for a dessert of your choice, or replace sugar, in a recipe for a dessert of your choice.



Food and Education

In January 2015, the Department of Education introduced new standards to ensure that all schools supply drinks with added sugar, crisp meals or in vending machines.

Research

Look up the healthy schools food standards. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/438881/healthy_schools_food_standards.pdf

Healthy Weight

A healthy weight can be achieved by following a balanced diet (alongside physical activity). People's food choices reflect their desire to keep within a healthy weight range.

An individual's **BMI** (body mass index) indicates whether the weight range for their height is healthy. It is calculated by dividing the weight (in kg) by the height (in metres squared: m²). Maintaining a healthy weight helps to prevent health conditions typically associated with being overweight or obese, such as heart disease and diabetes. The table below shows what a BMI score indicates.

BMI Score	Result
Below 18.5	Underweight
Between 18.5 and 24.9	Normal
Between 25 and 29.9	Overweight
Over 30	Obese

Remember – a BMI score below 18.5 indicates being underweight, which can be a sign of malnutrition or eating disorders.

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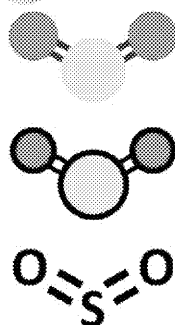


Health Conditions

Some health conditions may affect food choice. Some people add certain foods to their diet to improve a health condition, or avoid certain foods altogether, which may trigger a reaction.

Condition	Foods that may be avoided
Diabetes	Sugar and sugary foods
High blood pressure	Salt, saturated fats, trans fats
Heart conditions	Fat, stimulants such as coffee and alcohol
Asthma and allergies	Dairy products, wheat, preservatives*, artificial colours <i>allergic to dairy or wheat but not to nuts and vice versa</i>
Digestive issues	Dairy, tea/coffee, spicy foods, pickled foods, alcohol
Eczema	Dairy products, alcohol, tobacco

*Some people are allergic to the preservative E222 (sulphur dioxide) and avoid foods containing this preservative.



Some sulphur dioxide (SO2) is found in...

Health and Age

Food choices may be related to age. Infants and toddlers have smaller stomachs and so need to eat smaller portions of food. A child's sense of taste and preference can affect food choice and make them fussy eaters with an aversion to certain foods. In the later developmental stages of a child's life they may require foods that help to maintain healthy growth, and more calories to meet an active lifestyle and faster metabolism. In contrast, an older individual may choose to eat smaller meals and, in the case of women over 40, eat more foods containing calcium to help maintain healthy bones. Some people may avoid tough or hard-to-eat foods due to dental issues or dentures.



Some children have an aversion to certain foods such as broccoli or cabbage. They may follow through...

Celebrations and Occasions

There are many types of celebrations and occasions which may affect food choices, such as:

- birthdays (may eat more sugary foods, cake, jellies, etc. and consume more calories)
- religious festivals – may eat more sweets, spices, meat and sugary foods such as puddings or alternatively may fast (limit) food for a certain occasion

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- anniversaries (may eat richer foods and consume unfamiliar food)
- events and fairs (may eat food from burger vans or food stalls, which is usually high in saturated fats, and may consume sugary drinks)
- Hallowe'en (may eat more sweets and sugary foods)
- weddings (may eat rich food, particularly rich fruit cake)
- holidays (may eat unfamiliar foods, such as snails in France or spicy sausages in Austria or Germany)
- dining out (may eat a combination of foods which are unfamiliar to the digestion)

Apply

Choose most occasions to try to avoid

Income and Cost of Food

Food cost can be a factor in determining which foods a person buys or eats. An individual's income can affect their food choices as some foods are expensive and outside their budget. Healthy foods such as fresh vegetables and fruit may be too expensive for some individuals and families, and they may adapt their diet to include cheaper foods such as tinned and processed foods.

Some ingredients are more expensive than others, such as organic fruit and vegetables, which can be priced far too high for the wages of a low-income consumer.

- | | |
|--------------------|---------------|
| • asparagus | • saffron |
| • lemongrass | • avocados |
| • almonds | • truffles |
| • lobster | • coconut oil |
| • virgin olive oil | |

Did you know?

Some people prefer to buy local products to ensure they get a fair price.

A balanced diet can be maintained on a low income by incorporating cheaper healthy ingredients. Recipes which list expensive ingredients can be adapted to suit a lower-income budget.

Preferences and Enjoyment

Food is eaten not only to provide us with energy and nutrients, but for many people it is also eaten for enjoyment. In the previous chapter you discovered how taste receptors work to detect different flavours. In fact, your taste preferences not only depend on the ability of your taste buds to send signals to the brain, but also on genetic factors and even on the food you were exposed to as a child. It is not surprising that preferences and enjoyment of food, whether for taste, texture or appearance, can affect food choices. Some children develop an aversion to certain foods as they grow up, which can last through to their adult life. Some people have a 'sweet tooth' which means that they prefer sweet foods, while some people prefer savoury foods. Some people choose not to eat meat, fish or dairy products, which is referred to as a **vegan** diet. In this instance, food preferences may be prompted by ethical beliefs and concern for animal welfare. It is possible to enjoy a varied and balanced diet even if certain foods are avoided as long as avoided foods are replaced with healthy alternatives.

Availability and Seasonality

Some foods are available throughout the year, while others are governed by availability or seasonality. For example, pumpkins abound in the shops in the autumn ready for Hallowe'en celebrations; cranberries and turkey become more readily available nearer to Christmas as do certain foods such as stollen (fruit bread from Germany traditionally eaten at Christmas). Although most fruit and vegetables are readily available all year round in the UK, some people prefer to eat foods that are 'in season'. Foods that are in season have more nutrients (as they are fresher) and are sometimes cheaper to buy. Locally sourced food that is in season can help the environment by cutting the need to transport foods from other countries.

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Foods 'in season' may include spring greens, asparagus, blackcurrants, plums, cherries, damsons, blackberries, raspberries, strawberries, marrows, sweetcorn and some types of fish and meat.



Lifestyle (including time of day and available time)

A person's lifestyle can affect their food choices. For example, a busy person may not have time to prepare or cook food or even sit down to eat a meal. Some people may prefer to eat small snacks while on the go throughout the day, whereas others may prefer to eat a meal at a table. Lifestyle can affect how healthy or balanced a person's diet is if they do not have enough time to shop or cook. Some people may find that they eat differently at the weekend as they have more time to prepare and cook food. The time of day can also affect food choices; some people like to eat a large protein-rich breakfast, while others prefer a light breakfast of toast or cereal. Some people forego breakfast, which indicates that this can result in poor concentration levels throughout the day. They have been brought up and the routines and traditions associated with their childhood affect that meals are consumed. Some people may feel that they need to eat when they are stressed, they may reach for tasty or sweet snacks rather than eating a healthy meal (a fatty, salty snack in times of stress is referred to as 'comfort food'). A person's activity level will also affect what they should eat (calorie content). An active person has a higher energy requirement, so can consume more calories without gaining weight.



Some research has shown that the healthiest way to eat throughout the day is to have a substantial breakfast, a lighter lunch and then a very light dinner. This is not possible for some people with busy lifestyles, who may not have time to prepare or cook a large breakfast.

There is
like a king
prince a

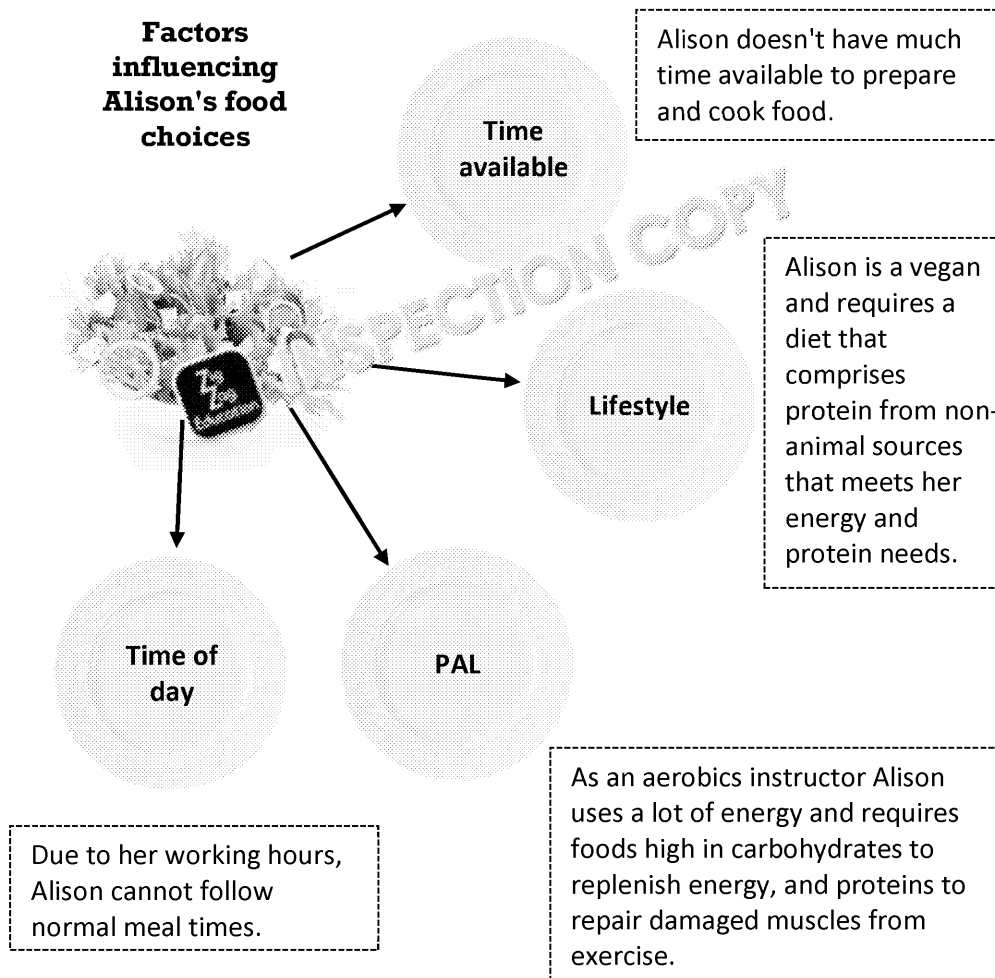
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Case Studies

Scenario 1 – Alison's choices on a plate

Alison is a busy person with a physically demanding job as an aerobics instructor, changeable during the week. Her hobbies include mountain climbing and long-distance running. Her food choices are influenced by her lifestyle, physical activity level (PAL) and healthy eating habits.



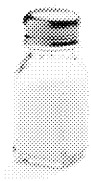
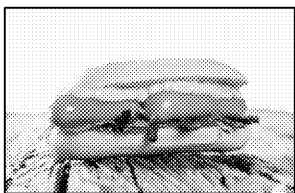

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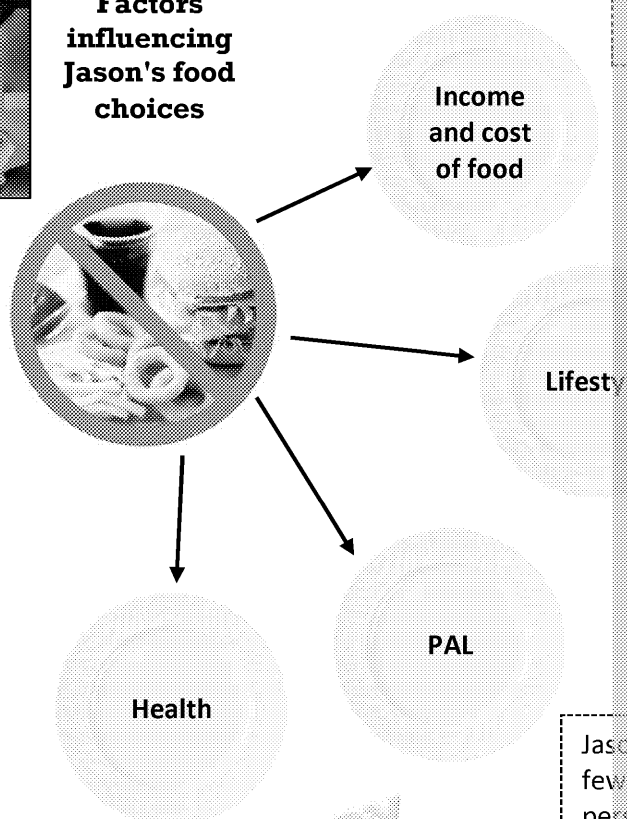
Scenario 2 – Jason's choices on a plate

Jason leads a sedentary life without much physical activity. He is on a low income, influenced by enjoyment and preference, his income and food cost.

Salt	Fatty food	Sugar
 <p>Salt can be a cause of, or can exacerbate, high blood pressure.</p>	 <p>Fatty foods are implicated in digestive disorders, obesity and heart problems.</p>	 <p>Sugary foods are implicated in obesity and diabetes.</p>



Factors influencing Jason's food choices



Jason is overweight due to the high fat content in his diet and has been diagnosed with high blood pressure (due to salt) and diabetes (due to sugar in his diet and inactivity).

Jason has a few friends who are active and healthy.

Food choice is a factor in health.

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Research

Look up the World Health Organization's report on red and processed meat. <https://www.who.int/news-room/fact-sheets/detail/red-and-processed-meat>

Apply

1. Select a recipe and give an explanation and reasons for your choice.
2. State how you have taken lifestyle and consumer choice into consideration.
3. Show your costings for the recipe and completed dish, and explain how the take differences in income into consideration.

Skills Example

Ali has been asked to prepare a recipe for a family of four, one of whom is a vegan, and one of whom has a sulphite allergy (preservative E220 sulphur dioxide). The low- to mid-income family likes to eat fresh vegetables daily.

After consideration of the dietary and other restrictions, Ali has decided to use the recipe from [The Vegan Society \(https://www.thevegansociety.co.uk/8254-aubergine-penne\)](https://www.thevegansociety.co.uk/8254-aubergine-penne)



Aubergine and chickpea penne

- Large pinch of saffron threads
- 450 ml / 16 fl oz vegan stock
- 2 tbsp olive oil
- 1 large onion, roughly chopped
- 1 tsp cumin seeds, crushed
- 350 g / 12 oz aubergine, diced
- 1 large red pepper, deseeded and chopped
- 400 g / 14 oz canned chopped tomatoes with garlic
- 1 tsp ground cinnamon
- 30 g / 1 oz fresh coriander, roughly chopped
- 400 g / 14 oz canned chickpeas, drained and rinsed
- 280 g / 10 oz vegan dried penne
- Salt and pepper
- Harissa or chilli sauce, to serve

Reasons for Ali's choice:

I have chosen this recipe for a family of four, one of whom is a vegan, one of whom has a sulphite allergy. For this reason, the recipe contains no animal products. I have used vegan penne pasta as some pasta contains egg. I have used vegan stock based with no meat products (e.g. chicken). I have used fresh, raw ingredients and avoided products with the preservative sulphur dioxide (E220) and have had to be particularly careful with chickpeas as these are sometimes preserved using E220, sulphur dioxide, and formaldehyde. I have replaced harissa with a home-made chilli paste using chilli flakes, cumin, coriander, and olive oil. Although the recipe contains a balanced amount of protein and calories, the therapist can advise on the need of adding meat to their meal if desired.

The low- to mid-income family is health conscious and likes to eat fresh vegetables. I have taken their lifestyle into consideration and their preferences for Fairtrade and organic products. I have also taken their budget into consideration, and this meal costs approximately 80p–£1 per person.

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All of the factors below have been taken into consideration when choosing this

Lifestyle Preference
Health Availability
Costs Enjoyment
Income Time

How the recipe could be modified in terms of cost and availability:

- Saffron may be difficult and/or costly to obtain, and so turmeric can be substituted.
- Aubergines can be replaced by squash, although this may be influenced by availability.
- Fresh herbs could be replaced by dried herbs.
- Olive oil can be replaced by sunflower oil.



Did you know?

Certain foods, e.g. pumpkins or cranberries, are more seasonal and more readily available at specific times of the year, such as Halloween and Christmas respectively. In these traditions, tradition and consumer demand influence food choice.



Things to think about

Discuss how low-income families could maintain a healthy diet, taking into account cost, alternatives and availability.



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Check your understanding: The range of factors affecting food choice

- Which of the following statements is CORRECT about PAL? (1 mark)
 - It refers to the physical activity level of an individual.
 - It refers to the psychological activity of the brain.
 - It refers to performance analysis.
 - It refers to the paleo diet.
- Which of the following statements is TRUE about someone with a sedentary lifestyle? (1 mark)
 - They expend less energy, so fewer calories are required.
 - They expend more energy, so more calories are required.
- Which of the following statements is TRUE about income and costs? (1 mark)
 - Food costs are not normally a prohibitive factor in food choice in the UK.
 - A low-income consumer may eat more fresh foods and fewer processed foods.
 - A low-income consumer may eat fewer fresh foods and more processed foods.
 - An individual's income has no influence on food choice.
- Which of the following statements is FALSE about how lifestyle may affect food choice? (1 mark)
 - Eating irregularly can interfere with concentration levels.
 - Eating a healthy breakfast improves performance in the day.
 - Busy lives can interfere with set meal times.
 - Busy lives have no effect on meal times.
- Identify which nutrient, when consumed in excess, can cause each of the following conditions. (3 marks)
 - obesity
 - hypertension
 - tooth decay
- Identify two ways in which an occasion/celebration may affect an individual's food choice. (2 marks)

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- Discuss how to plan menus and recipes for a low-income family. Take into account different factors. (6 marks)

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How religion affects food choices

There are many religions existing in the world and some of them may affect the food choices in a significant way. The table below shows how some religions may be a factor in food choices.

Religion/Belief	Food Choice
Christianity A religion based on the teachings of Jesus Christ 	There are many branches of Christianity, such as Catholic, Protestant, Presbyterian, Methodist, Eastern Orthodox and Pentecostal. There is no specific diet related to Christianity, at certain times of the year, such as festivals, feasting and/or fasting may take place. For example, during festivals, such as Easter, require a period of fasting or feasting. Fasting (reduction in food intake or not eating at all) is expected on Ash Wednesday and Lenten Fridays as a form of penance (atoning for one's sins). This is not required for all Christians and is down to personal choice. According to some Christians, Fridays are penance days. Therefore, Catholics traditionally fast on Fridays. The tradition at Easter is to eat chocolate (a symbol of life). Christmas is a celebration of the birth of Jesus, which is usually accompanied by feasting which may include eating turkey.
Hinduism A South Asian belief system based on Vedic religion with the worship of many gods	In Hindu culture the cow is considered sacred and therefore, Hindus observe a strict vegetarian diet, beef is generally not eaten. Some Hindus also follow a strict avoidance of certain foods (diet) including onions, garlic, leek, mushrooms, alcohol and meat. They eat in a way that minimises disruption or harm to the environment. Traditionally, the Hindu concept is one of non-violence (ahimsa) including animals. Some Hindus do eat meat but they try to do so quickly and humanely without it suffering. A typical Hindu diet includes rice, dhal (dried pulses such as lentils or yellow peas), spices, vegetables, fruit, beans, grains, nuts, seeds and milk.
Islam A Muslim religion founded by Muhammad (as a mark of respect, Muslims add 'Peace be upon him' whenever they mention the holy Prophet) which follows the teachings of the Qur'an. Islam means 'submission to the will of god (or Allah)'.	By Islamic law, Muslims must not drink alcohol or consume pork. They must only consume halal meat (in Arabic halal means permissible) which is slaughtered in the name of Allah. This ritual slaughter involves the slaughter of an animal while it is alive and allowing the blood to drain from the carcass while reciting a prayer from the Qur'an. It is permissible for the animal to be stunned before slaughter. The text which provides religious and dietary advice for Muslims is the Qur'an. Festivals, such as Ramadan (ninth month of the year, during which dawn until sunset for a month), require a period of fasting.
Judaism A religion of Jewish people based on the teachings of the Torah 	Judaism follows the teachings of the Torah and one of its key principles is the stunning of an animal before slaughter and animal slaughter. The slaughter must be conducted by a trained person. Slaughter of animals must be conducted so that the animal dies almost instantaneously and then death almost instantaneous. Consumption of pork is forbidden. Fruit and vegetables must be washed to remove soil and microbes and inspected to ensure they are kosher. Dairy products (cooking utensils) must be kept separate from meat. Shellfish is also forbidden. A Jewish diet is referred to as kosher.

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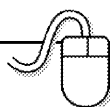
Did you know?

- A vegetarian diet has no meat or fish but may include dairy and eggs. A lacto-vegetarian does not eat eggs or meat but does consume dairy products. A pesco-vegetarian (pescatarian) excludes meat but eats fish.
- A vegan does not eat meat, fish, eggs or dairy or any other animal product for religious, ethical, moral or health reasons. A fruitarian only eats the fruit of a plant (including nuts and seeds) so as not to kill the whole plant.
- An atheist is a person who does not believe in a god or gods.



Research

Look up the PC's stance on stunning animals before slaughter www.pc.gov.uk/8254-religious-slaughter



Things to think about

Discuss how a recipe created for a follower of Islam must differ from a Hindu.

Apply

How would traditional food needs of:

- a Muslim
- a Jew?
- a Hindu?



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Check your understanding: Religion

1. Which of the following statements is CORRECT about a Muslim diet?
 - a. Only halal foods can be eaten.
 - b. Pork is the staple food for Muslims.
 - c. Muslims often celebrate with wine and champagne.
 - d. Only kosher foods can be eaten.
2. Which of the following statements is TRUE about Hinduism? (1 mark)
 - a. Neither beef nor milk can be consumed.
 - b. All Hindus follow strict dietary rules called the sattvic diet.
 - c. The cow is a holy animal and therefore, beef cannot be eaten.
 - d. Shellfish is among the forbidden foods.
3. Which of the following statements is FALSE about a Jewish diet? (1 mark)
 - a. Beef cannot be eaten together with dairy.
 - b. Egg cannot be eaten together with poultry.
 - c. The animals have to be slaughtered in a special way.
 - d. Kosher means that foods are forbidden.
4. Fill in the table to indicate how the following ingredients of a cottage pie can be modified to meet the dietary needs of a Jew. (3 marks)

Beef mince	
Beef stock	
Milk	

5. Hindus often follow a strict vegetarian diet. Identify one nutrient which is essential for a vegetarian diet. Justify your choice. (2 marks)

.....

.....

.....

6. Muslims have a set of particular food laws. Give three rules you would follow for a Muslim. (3 marks)

1.

2.

3.

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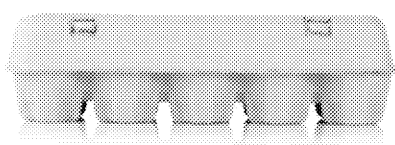
Ethical and moral beliefs linked to food choice

Some people's food choices are linked to their ethical or moral beliefs. These can include support for **animal welfare**, support for **fair trade** for developing countries, championing of local economy and help local growers, or a desire to promote **organic** farming or local foods. Some food choices are due to environmental concerns about population growth (a meat-based diet requires more energy, water and land than a plant-based diet) or the amount of land being used to raise livestock – source: *The Vegetarian Society*).

Animal Welfare

Animal welfare is about protecting an animal's mental and physical needs. Concerns over animal welfare can influence an individual's food choices and may even necessitate a complete change of dietary habits, as is the case of vegetarians and vegans. This means that a consumer should buy from a company with high animal welfare standards.

Concerns for animal welfare influence people's food choices for ethical and moral reasons.



Some people will only buy free-range eggs (those that are allowed outside at least part of the time) or those that have been allowed to roam freely and not kept in cages. Eggs sold in the UK must be stamped to indicate the type of hen used: 0 = organic 1 = free-range 2 = barn

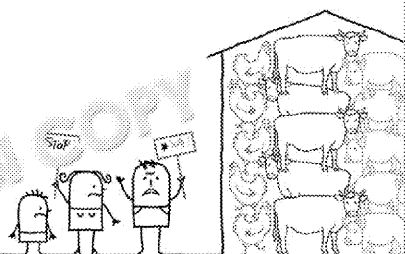
Research

Look up the UK government's advice on the welfare of free-range hens at zzed.uk/8254-free-range-hens

Look up the UK government's trade regulations for the marking of eggs at zzed.uk/8254-egg-marking

Some people are concerned about the way that animals are kept, particularly with the production of meat or eggs where animals are kept in confined spaces without exercise. Some individuals may choose to buy only products that are organic or that display a food label with the Red Tractor symbol from the Assured Food Standards Board or the RSPCA Assured logo, which means that the farms have undergone inspections to ensure animal welfare standards are met.

Some people object to the way in which some farm animals are kept.



Research

Look up RSPCA Assured information on their website zzed.uk/8254-rspca

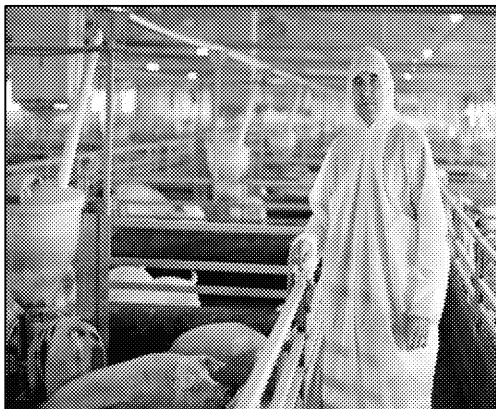
Look up the Red Tractor scheme at zzed.uk/8254-red-tractor

Did you know?

It is illegal to produce foie gras (French for fatty liver) in the UK due to animal welfare concerns. It is considered a cruel food by some people due to the methods used (force feeding grains and fat causing their livers to swell in size). It can, however, still be bought in the UK. In response to public protest, some UK restaurants have removed foie gras from their menus.

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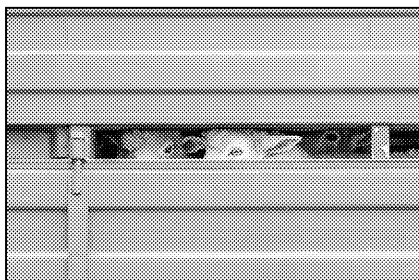




Intensive farming (also known as modern form of farming with a high yields more profit. Some people think it is not **ethical**.

In addition to factory farming methods, some people may also be concerned about concerns over an animal's welfare when in transit. The UK government has created live animals in transit. In some cases, Animal Transport Certificates may be required.

For this reason, some people's food choices are prompted by a desire to buy only locally sourced products.



Research

Look up advice for farmers, slaughterhouses, hauliers and pet breeders on live animal transport at www.gov.uk/government/organisations/department-for-environment-food-and-rural-affairs/publications/animal-transport-certificate-requirements

Did you know?

Some people's food choices are influenced by environmental concerns such as the distance a food product has travelled (food miles) and the effect that transport has on the environment.

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Vegans and Vegetarians

Some people's food choices may be prompted by compassion or concern for animals, which is ethically and morally wrong to take the life of an animal for human consumption. Some people eat meat but may eat fish, eggs and milk. Depending on the exact food choice, vegans are divided into four subgroups, as shown in the table below.

	Lactovegetarian	Ovovegetarian	Lacto-ovovegetarian
Eats	Milk and dairy	Eggs	Milk and dairy Eggs
Doesn't eat	Meat Fish Eggs	Milk and dairy Meat Fish	Meat Fish

Vegans are people who do not eat any animals or animal-derived products including dairy products or any product containing animal ingredients. A vegan may also avoid products which are manufactured by companies that test on animals and may not wear clothing that contains leather or any other animal product. A vegan does not drink milk because they do not want to exploit or use an animal in any way. Dairy cows must continue giving birth in order to produce milk, although female calves may eventually replace old dairy cows, the unwanted males (lactating means producing milk after birth) are removed from their mothers, some are kept as pets, and some are of no use and are slaughtered for meat. Vegans also avoid eggs because they do not want to exploit animals in any way and because they disagree with the methods used. Although hens (which are healthy) remain in a hatchery to become egg layers, male chicks are of no use and are killed. Egg-laying hens are a different breed of poultry from chickens and are not suitable for eating.



Some people are prompted by ethical reasons or environmental concerns. A 2010 study stated that agriculture, including dairy products, accounts for 7% of freshwater consumption, and 19% of the world's greenhouse gas emissions.

Did you know?

The former US president (1993–2001) Bill Clinton went (mostly) vegan for health reasons. Former US vice president Al Gore is vegan due to environmental concerns about climate change.

Apply

Research a recipe for a dish that Lorraine can make daily to meet the needs of:

- a lactovegetarian
- an ovovegetarian
- a vegan

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Ethical and Sustainable

Some food choices are affected by ethical or moral reasons relating to the environment about sustainability. Food production requires a large amount of resources, such as land. These are used not only to grow plants or feed animals, but also to keep the factories and shops, and dispose them if they are not eaten in time (this is known as food waste). For this reason, food production and food waste create large amounts of greenhouse gases, which together contribute to climate change and global warming.

People for whom these issues are important may choose to buy foods which have a lower carbon footprint, or are produced in a sustainable way.

Examples of such foods include local produce (as the distance from the farm to the plate is short, there is less need for transportation, less fuel is used and less CO₂ is released), Fairtrade products (e.g. bananas, coffee or tea) and fish from sustainable fisheries (usually labelled with the MSC logo).

Did you know?

The carbon footprint is the total amount of greenhouse gases and other greenhouse gases emitted during the production and transportation of a product.

Fairtrade

Fairtrade is a scheme run by the Fairtrade Foundation that ensures fair prices, better living conditions and fairer terms of trade for local growers (by setting a Fairtrade minimum price). Fairtrade produce, such as coffee and bananas, sold in the UK may be more expensive than non-Fairtrade products but some people are prompted by ethical and moral concerns to buy only Fairtrade where possible.

The MSC logo is a symbol of sustainable fishing.

Research

Look up information on Fairtrade at [zzed.uk/8254-fairtrade](https://www.zzed.uk/8254-fairtrade)

Apply

Next time you're shopping, try to find as many Fairtrade or sustainable products as you can. Can you find them?

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Genetically Modified (GM)

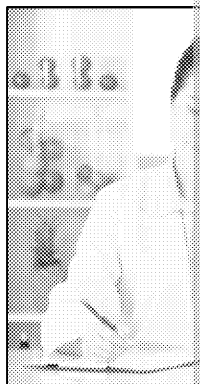
Genetically modified foods are foods which have been genetically altered with the genes of another organism. This can increase food yield and increase pest and disease resistance in crops. Biofuels made from GM crops help to reduce dependency on fossil fuels. However, some people disagree with GM methods and avoid any foods containing genetically modified ingredients. In 2004, new EU rules for GM labelling (for EU member states) were introduced to cover all GM food and animal feed. If a product contains GM ingredients, it must be stated on the label. To help consumers, some foods are labelled as GM-free or GM-free (which means Genetically Modified Organism).

Advantages:

- ✓ It increases pest resistance and disease resistance.
- ✓ It increases crop yield.
- ✓ Potentially, it leads to cheaper food (higher yield, longer shelf life).
- ✓ The flavour and nutritional value can be altered.

Disadvantages:

- × It can contaminate other crops or weeds via windblown seed/spores resulting in 'superweeds'.
- × Some people believe that genetically modifying a crop can eventually weaken it.
- × Some believe there is not enough research into allergies and build-up of allergens.



Things to think about *for discussion and thought*

Discuss the link between GM foods and their potential role in preventing food shortages, and the controversy surrounding the possible disadvantages of growing GM crops.

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Check your understanding

Ethical and moral beliefs linked to food choices

1. A vegan would be likely to refuse to eat... (1 mark)
 - a. honey
 - b. maple syrup
 - c. molasses
 - d. golden syrup
2. Vegetarians who eat milk and dairy can also be called... (1 mark)
 - a. pescatarians
 - b. ovovegetarians
 - c. lactovegetarians
 - d. fruitarians
3. Which of the following statements is FALSE about GM foods? (1 mark)
 - a. They are designed to produce a higher yield.
 - b. They may be linked to food allergies.
 - c. They have no impact on the environment.
 - d. Their flavour can be improved.
4. Complete the table to explain what food products are unlikely to be eaten if the following factors are important. (3 marks)

Local community	
Animal welfare	
Climate change	

5. Assess how environmental and animal welfare concerns influence an individual's food choices. (6 marks)

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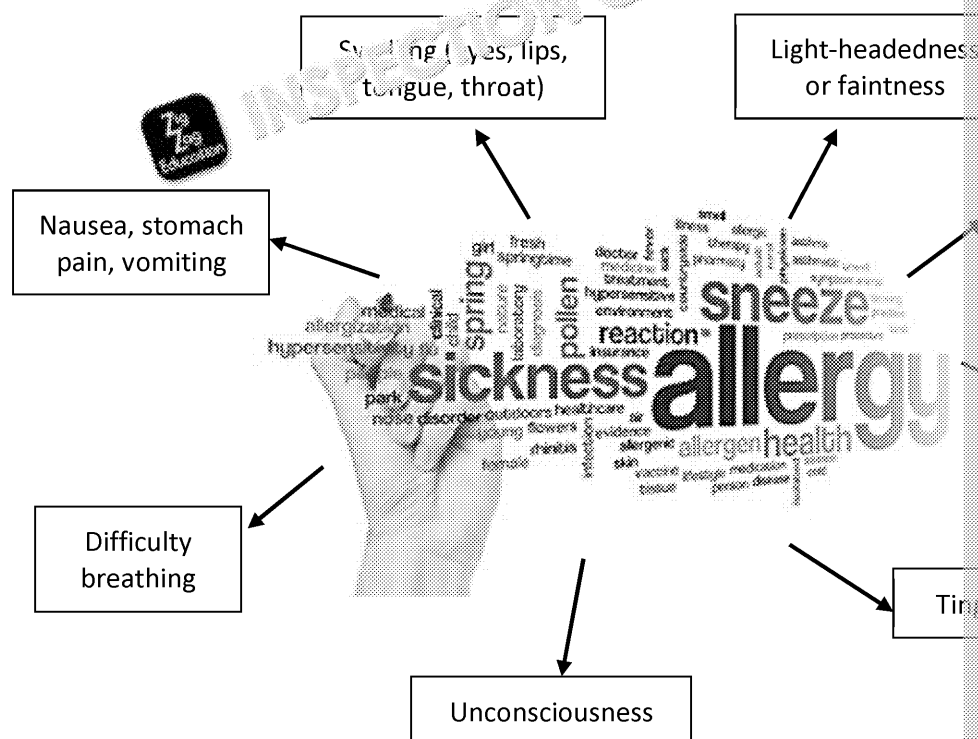
How medical reasons (intolerances and allergies) affect food choice

Earlier we briefly discussed various health reasons which affect people's food choices. Allergies also fall into that category. A food intolerance is an adverse reaction to food involving the digestive system. A food allergy is an allergic reaction to food involving the immune system.

Allergies

An allergy occurs when the body produces antibodies to fight a perceived invader that is considered safe and innocuous for most people, such as celery, but which causes an adverse reaction in an individual with a compromised immune system. An allergic reaction can be mild or severe, even death. Allergic responses may only take a few minutes to manifest or may take several days.

Signs of an allergic reaction include the following:



Anaphylactic Shock

Anaphylactic shock is a severe response to a food allergen or non-food related factor. Symptoms are swelling of the lips and throat, itchy skin / hives and difficulty breathing, unconsciousness or an asthma attack. People who are at risk of anaphylactic shock are provided with adrenaline in the form of a pen which they can inject.



Epinephrine
synthetic
adrenalin

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Allergens

It is a legal requirement for food handlers / caterers and manufacturers to inform food which may be allergenic. The 14 allergens which must be displayed in ingred

- soya beans
- milk / dairy produce
- cereals containing gluten, such as wheat, rye, barley and oats*
- crustaceans (e.g. prawns, crab, lobster)
- molluscs (e.g. oysters, snails, octopus)
- eggs
- fish
- mustard
- celery
- sesame
- lupin
- peanuts
- tree nuts (e.g. almonds, cashews)
- sulphites

*Oats are naturally gluten-free, but are processed in the same factories as other cereals and very often become contaminated with gluten!

Did you know?

Peanuts are not really legumes – edible seeds. For that reason, the groundnuts.

Storing and Handling Allergenic Ingredients

It is important that allergenic ingredients do not come into contact with non-allergenic ingredients. Therefore, non-allergenic ingredients **MUST** be stored and handled separately from allergenic ingredients. Colour-coding can help to identify allergenic ingredients in the storage area. Storage containers must be labelled so that allergenic ingredients can be **CLEARLY IDENTIFIED**.

All food handlers should be aware of their responsibilities when handling, preparing or storing allergenic ingredients, and of the danger that is posed to consumers with allergies when allergens are ingested. Allergies can be serious and allergens (such as peanuts) can be **FATAL**.

Preventing Cross-contamination

To prevent cross-contamination between allergenic and non-allergenic ingredients

- Clean utensils thoroughly after using allergenic ingredients and before preparing food for people with allergies.
- Food handlers should also ensure that spillages are wiped up promptly and thoroughly after touching allergenic food and then handling non-allergenic food.
- Store allergenic and non-allergenic foods separately.
- Clearly label allergenic ingredients.
- Clean work surfaces or use separate work surfaces and dedicated equipment.
- Changing into protective clothing can help to prevent cross-contamination of allergenic food.

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Food Intolerances

Food intolerance is different from an allergy and does not result in life-threatening anaphylactic shock. Food intolerances can necessitate a change in food choices and prevent symptoms. Typical symptoms of food intolerance can include bloating, stomach pain and headaches. Foods that can be the cause of food intolerances include:

Gluten (from wheat, rye, barley and oats*)

Wheat (bread, baked goods, cereals and many other foods)

Yeast
stomach
problems

Lactose
dairy

*Oats are naturally gluten-free, but are processed in the same factories as other cereals and can contain gluten!

Intolerance to milk can be caused by a missing enzyme (lactase) required to break down lactose in the body, which results in bloating, stomach ache and/or diarrhoea. An allergic reaction to milk can result in an allergic reaction with similar symptoms to lactose intolerance, making it difficult to distinguish between allergy and intolerance.

Exam Tip

Due to food intolerances and food allergies, it is important that ingredients are clearly listed on food items or menus.

If you modify a recipe for different religions, cultures or dietary groups, justify your reasons for the food choices you make.

In addition to dairy products, such as cheese and yoghurt, many other foods contain milk as an ingredient; for example, cake, biscuits, crackers, chocolate.

Exclusion or Elimination Diets

In order to find the cause of an allergy or food intolerance, a person must undergo a diet of excluding suspect foods from their diet and keeping a check on their symptoms. Once the cause is identified, the person can reintroduce an excluded food known to cause intolerance into their diet without causing a reaction as their body has built up a tolerance to it.

Apply

List one food that may be avoided due to food intolerance and one food ingredient that may be avoided due to food allergy.

1. Create a recipe for a lactose-free product and justify your reasons for the choices you make.
2. Modify a recipe for bread to meet the needs of a gluten-free diet.

Things to think about

Discuss how an individual with a food allergy could be at risk when eating out.

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Check your understanding: How me (intolerances and allergies) affect

- Which of the following foods is an allergen which must be displayed in a menu? (1 mark)
 - Lettuce ☐
 - Celery ☐
 - Cucumber ☐
 - Radish ☐
- Which of the following foods is most likely to contain gluten? (1 mark)
 - Tomato sauce ☐
 - Cottage cheese ☐
 - Cheese sauce ☐
 - Rice pudding ☐
- Anaphylactic shock is a life-threatening reaction characteristic of... (1 mark)
 - allergies ☐
 - food intolerances ☐

- The following recipe is for custard sauce:

4 large egg yolks
2 tbsp caster sugar
½ tsp salt
500 ml whole milk
1 vanilla pod

Identify one ingredient of custard sauce which can cause food intolerance and one which can cause food allergy. (2 marks)

Food-allergy-related agent	
Food-intolerance-related agent	

- During production of cheese, milk undergoes many changes. Explain why a lactose-intolerant person, but not for a person allergic to milk. (2 marks)

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[illegible]

1. A substance which causes an allergic response (8)
2. A non-life-threatening reaction to certain foods, causing symptoms such as d
3. Relating to food which has been treated with no, or a minimal amount of, an
4. Person who eats halal foods only due to religious restrictions (6)
5. This can affect when certain foods are available throughout the year (11)
6. An acronym that refers to an individual's activity level (3)
7. Slightly above the range of healthy BMI, but not obese (10)
8. An environmentalist may avoid certain foods due to moral reasons and what
9. The way that an individual eats, works and relaxes is referred to as what? (9)
10. Eggs from hens which have been allowed outside in the fresh air for at least
11. Produce that is sourced ethically to ensure that the buyers get a fair price (5)
12. Food which is permitted for a Jew (6)
13. This refers to an individual's energy requirements while at rest: basal metabolic rate



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Chapter 3: Food labelling and marketing influences

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Overview

In this chapter we will look at the importance of food labelling and how to interpret nutritional information. We will also explore various methods of marketing and how they affect food choices.

Learning outcomes

After studying this chapter you should be able to do:

- ☐ list mandatory information which should be included and recognise non-mandatory information
- ☐ interpret nutritional labelling
- ☐ understand how food marketing can influence choices

Key Terms

Allergen:	Usually non-harmful substance which can trigger an oversensitive immune system, causing an allergic reaction
Best before:	Date mark which applies to food quality
Consumer:	Someone who uses or purchases a product or service
Health claim:	Statement which directly links consumption of a food product to health benefits
Non-mandatory information:	Information which may appear on food labels but is not required by law (e.g. serving suggestions)
Nutrition claim:	Statement which indicates the content of a food product is beneficial for health in a food product
Pester power:	The ability of children to influence their parents' purchasing decisions, such as sweets and toys.
Use by:	Date mark which applies to food safety

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Food labelling and marketing in the UK

The information included on a food label and the way a product is displayed in a shop can influence people's food choices. Food labelling is subject to EU law, and all countries belonging to the EU have to apply these rules. This is to ensure that all European citizens have the possibility of making an informed choice when buying food. Various marketing techniques are used to make products appealing.

Food labelling

Food labelling can affect an individual's food choice, whether through providing information about the nutritional value, fat, sugar and/or salt content or by listing potential allergens or ingredients that need to be avoided by some people. Some information is mandatory, such as ingredients, and some information, such as serving suggestions, is non-mandatory. Food marketing can influence food choice by using ploys such as 'buy one, get one free' (BOGOF) offers and special offers.

Mandatory information:

Allergenic ingredients
Nutritional information
Date marks

Non-mandatory information:

Serving suggestions
Provenance (place of origin)

Influences



Mandatory Information

Mandatory information on labelling is currently governed by EU (European Union) legislation and mostly applies to pre-packed foods from December 2014. New mandatory legislation was introduced in December 2016. Mandatory information on food labels

Mandatory information on food labels

The name of the food	This must be the real name that meets certain naming standards for marketing purposes. For example, a fat spread made of 50% oil cannot be called 'butter'.
List of ingredients	This must include allergenic ingredients which must be emphasised. Ingredients must be listed by weight in descending value, which helps to ensure food safety as the consumer can assess whether it contains anything that might cause him/her harm. For example, if a product contains wheat flour, a coeliac will see it in bold and with an asterisk.
Quantitative ingredient declaration	Introduced as QUID, this provides a percentage of particular ingredients in a product (unless used in small quantities as flavourings).
Net quantity	This is the weight or volume of the food.
Nutrition labelling	From December 2016, food labels must include nutrition information, whether health claims have been made on the packaging, and sugar content (high caffeine content in drinks must be labelled for children, pregnant women or breastfeeding women. High salt content must be labelled if 150 mg per litre). The nutritional value for energy, fat, sugar, protein and salt has to be included either per 100 g or per 100 ml.
Date marks	This includes best before or use by dates.

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Mandatory information on food labels	
Name and address	This is the name and address of the food supplier. It is very important as the company is responsible for the product, as it helps to track it. For example, if a piece of glass found in a tin of mushy peas. Food safety can be traced back to the producer more easily and the producer can take steps to prevent a similar incident – or decide to withdraw a whole batch from the market if they encounter the problem.
Type of treatment used	This treatment could be: freeze-dried, refrozen, dried, smoked, etc. A label must indicate if an ingredient has been treated. It also has to indicate if the food contains GM organisms or is derived from GM animals and plants.
Country of origin	In some cases it is mandatory to label the country of origin. This is often seen on pictures on the packaging to help lead consumers. The country of origin for the fresh, chilled and frozen meat of sheep, pigs, goats and poultry must be stated.
Storage conditions	For example, a label may tell you to use product within a specified number of days to ensure the safety of food, as proper storage conditions are required to prevent microorganisms.
Added water	If it is more than 5%, it must be displayed on the label.
Added ingredients	Added proteins, sweeteners, aspartame and colourings must be listed. Liqueur must also be displayed on a label. An appropriate warning must be given as well, if applicable.

Ingredients: Sugar, Glucose Syrup, Flavourings & Colours May Contain **E102, E110, E122, E129, E132, E133, E139, E142, E155, E171. E no's listed in BOLD, may have an adverse effect on activity**
MOWBRAY Confectionery, Blackpool FY3 7UN ENGLAND

Allergens and additives which may have an adverse effect on health are often emboldened as a warning underneath it.

Date Marks

When checking date marks, ensure that you know the difference between 'best before' and 'use by' dates.

- **Best before** dates refer to the date at which the **QUALITY** of food will be affected. Food may still be safe to eat after this date. So 'best before' dates refer to *quality*.
- **Use by** dates are used for perishable foods such as fish or dairy products. Food should NOT be eaten. A 'use by' date refers to the **SAFETY** of the food.

It is important to check the date marks on food.

Non-mandatory Information

Non-mandatory information found on labelling includes serving suggestions, either in the form of pictures of the food inside, health and nutrition claims, etc.

A serving suggestion attempts to display the food product in the best possible way to make it look appetising and may also display pictures of ingredients or food not contained in the product.

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¹ <https://www.food.gov.uk/enforcement/regulation/fir/labelling>

Nutritional Labelling

Rehydrated dried figs
Ingredients
88% Dried Figs, Water, Preservative: Potassium Sorbate.
Allergy Advice
May contain Sulphites.
Storage and Use Instructions
Store in a cool, dry place. Once opened, keep refrigerated and consume within 10 days.
Vegetarian / Vegan Status
Suitable for Vegetarians and Vegans. Although every care has been taken to remove stories, some may remain.
Disposal: Bag – Not Currently Recyclable. Please check with your local council for further recycling information.

This food label displays information about ingredients.

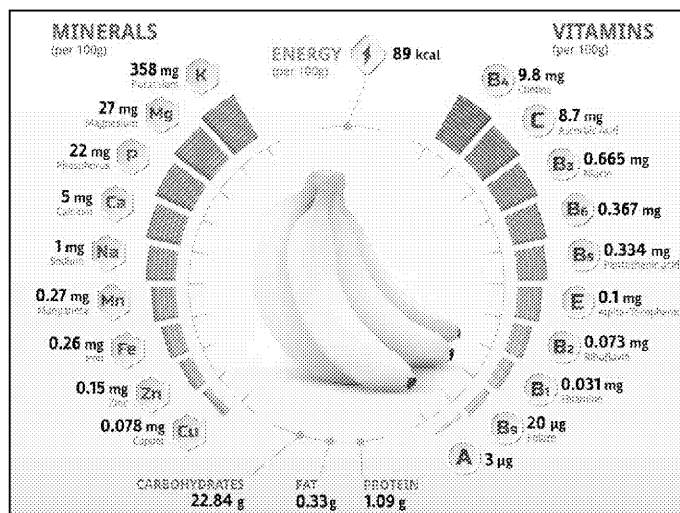
It also displays non-recycling suitability for various materials.

From December 2016 all packaging must include the following nutrition information (per 100 ml, or per portion).

- energy (in kJ and kcal)
- fat (in g)
- saturated fat (in g)
- carbohydrate (in g)
- sugars (in g)
- protein (in g)
- salt (in g)

The ingredients are displayed in the nutritional information per 100 g or per 100 ml.

If a claim has been made about any nutrient within the product, then the amount included in the nutritional information.



The nutritional information for 100g of banana shows that it contains 89 calories, 22.84g carbohydrate, 0.33g fat, 1.09g protein, and 1.09g sugar. Therefore, we can see that 100g of banana provides approximately 107 calories, 22.84g carbohydrate, 0.33g fat, 1.09g protein, and 1.09g sugar.

An average woman should consume around 2,000 calories per day. An average man 2,500 – 2,700 calories per day. An average banana provides 107, calories which is just over 5% of a woman's recommended daily calorie intake. The recommended calorie intake from a balanced diet is 45%–65% from carbohydrates, 10%–35% from proteins and 20%–35% from fat.



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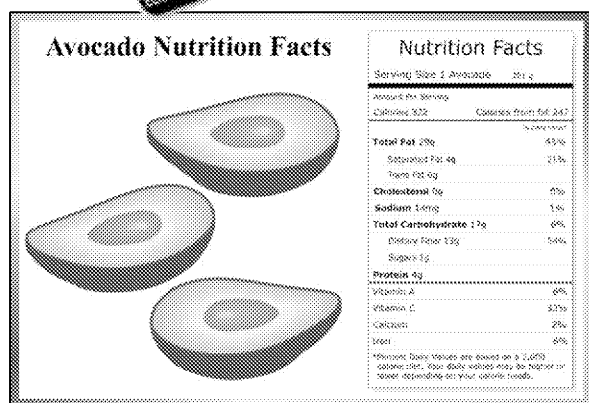


The recommended daily amount stated on nutritional labelling is now called the RDA – Guideline Daily Amount). The RI values are based on an average-sized female with an active lifestyle. The RI indicates the maximum recommended daily amount that can be consumed in a balanced healthy diet.

The RI for an average man and woman is:

	Woman	
Energy	8,400 kJ / 2,000 kcal	100%
Total fat	70 g	
Saturates	20 g	
Carbohydrate	260 g	
Total sugars	90 g	
Protein	50 g	
Salt	6 g	

The nutritional information is usually displayed as a percentage of the RI, so an average man would consume 100% of the total calories for an average woman.



The nutritional information for an avocado is shown as a percentage of the RDA. The recommended daily intake for an average man is 100%. Most of the fat in an avocado is unsaturated, which is good for you. You should consume approximately 70g of fat per day, so an average man would consume 100% of the recommended daily intake.

Research

Look up information on nutritional labelling at zzed.uk/8259-food-labelling

Nutrition and health claims

Although it is not mandatory to include nutrition and health claims on food packaging, many producers decide to include them to increase the attractiveness of the product.

Nutrition claims are statements which refer to a specific nutrient content in the given food product, e.g. 'source of omega-3 fatty acids' or 'high-calcium'.

Health claims are statements which describe the relationship between consuming the product and a health claim. Health claims have to be based on scientific research and approved by European Commission. An example is 'Probiotic contributes to normal digestion by production of hydrochloric acid in the stomach'.

Apply

1. Take a look at the nutritional content for a tin of garden peas and list the protein for half a can and the percentage RI for half a can.
2. Find out approximately how many calories there are in a biscuit, e.g. a Bourton Biscuit and list the percentage RI for an average adult male.
3. Look at the nutritional information on an average sized packet (35.4 g) of rice and list the percentage RI for an average adult male. What percentage RI is this for an average adult male?

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Check your understanding: Food

1. Which of the following statements is correct about mandatory information?
 - a. It is compulsory and required by EU food legislation.
 - b. It is at the manufacturer's discretion whether to display it or not.
 - c. It refers to marketing and advertising and is used to tempt consumers.
 - d. It refers to serving suggestions displayed on food products.
2. Nutrition information is displayed as the amount of each nutrient per volume or weight of food.
 - a. 50 g or 50 ml ☐
 - b. 100 g or 100 ml ☐
 - c. 100 mg or 100 ml ☐
 - d. 100 g or 100 kcal ☐
3. Which of these nutrients do not have to be included in the nutrition information?
 - a. protein ☐
 - b. saturated fats ☐
 - c. essential fats ☐
 - d. carbohydrates ☐
4. List three pieces of information which are included on a food label by law.
 1.
 2.
 3.
5. Explain the difference between nutrition claims and health claims. Give an example of each.

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6. Describe how to advise a consumer to work out their diet using recommended daily allowances for carbohydrates, protein, fat and calories. (4 marks)

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Food marketing

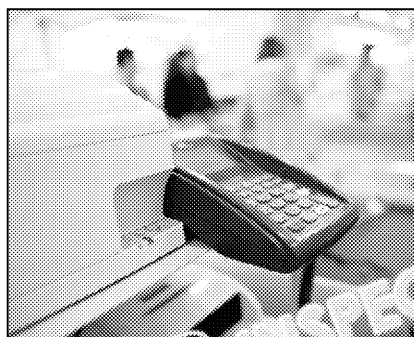
Food marketing or advertising can influence an individual's food choices by using and deals, such as meal deals, 'buy one, get one free' (BOGOF) and special offers.

Supermarket promotions can encourage consumers to buy more products, e.g. two for one, discounted products, buy one and get second half price, etc. Purchasing more than is needed can lead to food waste.

Meal Deals	BOGOF	
		
Meal deals are promotions that encourage a consumer to buy a product (such as a sandwich) and get a deal with it (such as a free drink).	BOGOF is a promotion that encourages consumers to buy an item and get another item free. Some offers are for buy one, get one half price. Food offers can lead to food waste if the surplus food products are not consumed.	Disco me t co (1 enc me

Point of Sale Marketing

Point of sale marketing refers to the attempt to increase sales at the counter or till place. Point of sale marketing tries to catch the attention of consumers waiting in line and encourages them to make an unplanned purchase. A queuing consumer has promotional displays while they wait, and may feel bored, thirsty or hungry and feel for snacks, drinks, sweets or magazines, particularly if there is a deal or discount. A consumer who is more likely to be tempted by point of sale marketing is referred to as an 'impulsive buyer'. Supermarkets may try to tempt customers back by giving a 'money off' coupon with their receipt.



Point of sale (POS) is where a purchase is made, such as a shop till or supermarket checkout.



Reward cards are a common way for supermarkets and shops to encourage consumers to return to their shop by providing points for every purchase made which can be redeemed against future purchases.

Did you know?

Eye level is 'buy level' and this influences where items are positioned on shelves near to point of sale.

Some consumers are tempted by brand names while others are tempted by value items (usually supermarket own brands).



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Media Influences

The media (magazines, newspapers, recipe books, TV programmes, diet DVDs/books, the Internet) all play a part in influencing the food choices of consumers, through health articles, diet advice, food scares, hype over 'superfoods', food provenance programmes (i.e. where your food comes from), advice on nutrition (such as vitamins and minerals), vegetarian/vegan societies' help and advice, and recipes in magazines, online and on TV. Some newspaper, online or magazine articles use results from recent food research to create (sometimes sensational or deliberately provocative) headlines to hook potential readers. Advertising on TV is designed to appeal to the average consumer and through clever use of imagery and jingles (short songs or tunes) that stick in the

An example of such action is *product placement*. In product placement, a popular TV show or series is asked to use a particular product so that the label can be clearly seen to create positive connotations in the consumer's mind and increases trust of the brand. Such products are often sought for, which increases sales and profit for the producer.

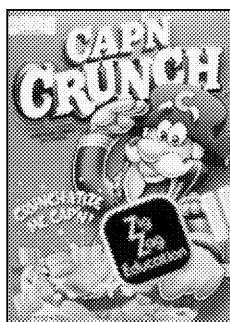


In this TV programme, the woman is drinking coffee from a popular brand. In the background, you can see a hotel's logo. This is an example of product placement in a TV programme.

Another technique involves hiring celebrities, actors and other well-known people to endorse products in TV adverts. This also helps to create positive feelings towards the product. The brain says 'if it is good enough for this superstar, it is good enough for me'.

Food producers can also attract consumers by using specific vocabulary. Keywords like 'traditional', 'like at home', 'real' are examples. Marketing techniques also involve using words like 'vegetarian' or 'vegan-friendly', so that when shopping vegetarians and vegans don't need to check which products are suitable for them.

It is also quite popular to use pictures of cartoon characters on foods which are targeted at children. Even if it is not the children who make the final choice at the till, they can use **pester power** to influence their parents.



These boxes of breakfast cereals are clearly aimed at children.



This selection of cereals is aimed at health-conscious consumers.

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Apply

What other marketing techniques can you name?



Things to think about

Discuss how advertising can influence food choices.



Check your understanding: Food

1. What does POS stand for? (1 mark)
 - a. Percentage of sales ☐
 - b. Point of services ☐
 - c. Point of sale ☐
 - d. Put on sale ☐
2. Which of the following does NOT refer to food marketing? (1 mark)
 - a. Selling a product at full price ☐
 - b. Selling a product half price ☐
 - c. Selling a product as part of a meal deal ☐
 - d. Selling a product with a BOGOF deal ☐

3. Explain why placing products at eye level in a shop may be an effective technique. (2 marks)



4. Impulse buying refers to unplanned decisions made right before the purchase. Define impulse buying and the technique which is aimed at impulse buyers. (1 mark)

5. Identify five marketing techniques which help to increase sales of products. (5 marks)



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How to make informed choices about food

A food label can provide you with a lot of information – ingredient lists, nutritional information. Marketing specialists also have their input, trying to convince you to buy their products with their colourful, eye-catching packaging or easy-to-remember slogans. But how can you make informed choices when buying your food?

What do you buy food for?

The first thing that comes to mind is – to satisfy hunger. That's mostly true, but there are other reasons why people buy food. For example, you can buy food for pleasure or enjoyment. You might want to host an official dinner or a barbecue. Depending on the occasion, you will seek different types of food. It is helpful, then, to write a shopping list beforehand so that you know what exactly you need.

How to choose?

When at the shop, pay attention to the freshness and quality of foods. Here are some things to look for:

- The packaging should be intact, without any unintended openings or cuts
- Date marks should be clearly visible (remember that foods that have passed their use-by date should not be sold)
- Quality of the product – all fresh foods, such as fruit, vegetables or meat, should be fresh and undamaged

It is also very important to pay attention to the ingredients list and nutrition information, which are mandatory on food labels. Always read the list of ingredients if you or any of your guests / family members are allergic to any food ingredient. Also pay attention to fat, salt and sugar content, especially if you or anybody is suffering from conditions such as heart disease or hypertension.

Using the nutritional information on the label, you can also work out how the food in question will fit into your diet. By calculating the number of calories and nutrients of foods you can quickly assess whether a food is suitable for you (or not to create a balanced diet) or not (e.g. contains too much sugar and shouldn't be eaten every day). An exception here may be celebration food, although it is more and more popular to have healthier options to meet the needs and requirement of today's consumers. The traffic light labelling system can be helpful in choosing low-sugar, low-salt or low-fat products – simply look out for the green colour.

It is also worth paying attention to non-mandatory labelling, as it may save you some money. For example, various logos are used to identify foods which are vegetarian and vegan, gluten-free, lactose-free, etc.

Apply

When you are at the shop, pay attention to the following:

-
-
-

Apply

During your next shopping trip, try to find as many products as possible which are 'natural'. Read the ingredient list to see if the claims are justified.

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Portion size

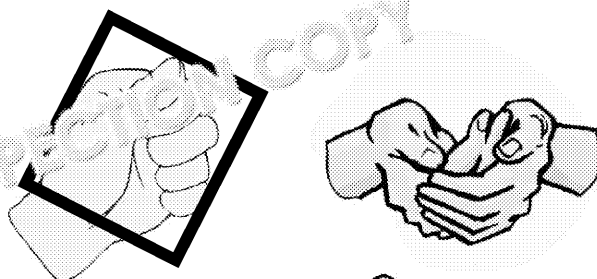
When planning a meal it is also recommended to control the portion size. A portion of food that is served to a person – a batch of a food usually contains multiple portions. A (whole pot) of tomato soup may contain around eight portions of the soup – depending on the size of the pot.

A portion which is suitable for an adult man will certainly not be good for a preschool child. Planning the portion size is important for a few reasons:

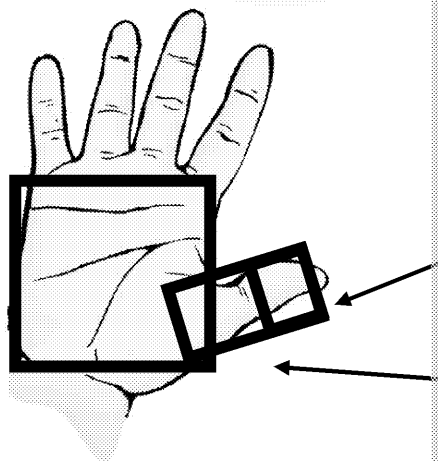
- it helps to ensure that nobody leaves the table hungry
- it helps to prevent overeating (which may lead to overweight and obesity in the long term)
- it prevents food waste (as there are no leftovers)

You can find some handy tips in the figure below.

A fist helps to judge how much carbohydrate you need – such as pasta, rice, potatoes.



A palm is the recommended portion size of meat, fish or other protein-rich food.



To measure the correct portion, you can also use various utensils, such as measuring spoons, measuring cups, measuring jugs, measuring ladles or kitchen scales.

Costing of recipes

The cost of food is an important factor when buying and cooking food, especially for those on a budget. It is important to consider the social benefits. Using the available, cheap ingredients to make a healthy meal for a family can be difficult, but certainly isn't impossible. If you wish to keep the cost of food low, there are several things you can do:

- **offers and discounts** – foods sold in larger packs or multi-packs are usually cheaper than those sold in small packages; it is worth considering when buying dry foods, such as rice, pasta, etc. – you may spend more money at once, but in general the cost of food will be lower.
- **seasonal foods** – fruit and vegetables tend to be cheaper in their harvesting season. For example, kiwis and oranges are usually cheaper in winter, while strawberries may be a bit more expensive.
- **special offers on foods which are nearing their expiration date** – some food items, such as fruit, meat, and dairy, can be sold for less if their use by date is close; it is worth using them immediately – but remember that they cannot be stored.

Apply

Sunday roast is among the most popular British foods. Try to cost the recipe (both per batch and per portion). Think about how to lower the cost of the dish.



Apply

Food banks can help to reduce food waste by putting surplus food on the table. By using typical food parcel contents (e.g. rice, tinned beans, tinned fruit, sugar and biscuits) as ingredients only, try to

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Chapter 3: Quiz-ine

Fill in the answers to the questions below to reveal a word relevant to food labelling. The shaded squares (the black squares are spaces between words).

1															
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															

- Marketing technique where a food stand is located near the till to attract the customer (5, 2, 4)
- Date mark which applies to food quality (4, 6)
- Type of fats indicated on the food label by law (9)
- 'Contains calcium and vitamin D' is an example of a _____ (9, 5)
- Listed in descending order by weight on a food label (11)
- Where food comes from (6)
- Marketing technique which involves showing branded products in films (7-9)
- Promotion which encourages consumers to buy an item to get another one (8)
- Has to be stated on the food label if more than 5% of this substance has been added (9, 6)
- Date mark which applies to food safety (3, 2)
- Recommended daily amount stated on nutritional labelling (9, 6)

The shaded squares reveal these words:



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Answers

Chapter 1: Sensory perception

Sensory evaluation

Things to think about: (p. 4)

Our olfactory system influences our food preferences. Food smells (in the form of tiny molecules) reach the scent receptors in the nose; the olfactory system transmits the signal to the brain and on to the brain. We then react to the smell by finding it appetising or unappetising. Food molecules can be received by special sensors at the top of the nose. Our senses of smell and taste are linked, so a blocked nose affects your sense of taste.

Things to think about: (p. 9)

Controlled conditions are important for taste tests to ensure reliability of the results. Testers should ensure that the tester does not become distracted by smells, appearance or sound, and that the food sample is consistent.

Check your understanding:

1) B 2) B 3) B 4) B (1 mark for each correct, max. 4 marks)

5) 1 mark for each correct, max. 2 marks

Any two from:

- golden brown colour
- soft
- glossy
- caramelised
- sweet aroma

Other suitable answers may be accepted.

6) 2 marks for each fully described point, max. 6 marks:

Any three from:

- Choose the correct target group – for a muscle-building plant-based product, men and women who are physically active and potentially vegetarians or vegans.
- Aim of the product – to build up muscles, to support healthy body composition and to protect from degenerative diseases.
- How to set up the taste panel – testers can be both experienced and non-experienced; a size of a third of a cup (not a whole one, as this might be too much); a chart to record results and an explanation of how to use it, etc.
- For this product, the taste panel should be consumers of protein drinks who exercise. This is to ensure that the product is assessed by a relevant group, who are most likely to buy the product.
- Although sex is not necessarily a criterion for this test, more men than women consume protein drinks and would be more likely to be in the age range of 18 to 50.
- As this is a plant-based drink, the taste panel should contain a proportion of vegetarians and vegans to be the likely consumers, although non-vegans may also buy the product and therefore should be included.

Other suitable answers may be accepted.

Chapter 1: Quiz-in

1. Olfaction
2. Umami
3. Eyesight
4. Triangle
5. Subjective
6. Organoleptic
7. Ranking
8. Hedonic
9. Preference
10. Star profile

The shaded fields reveal these words: **taste panel**

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Chapter 2: Factors affecting food choices

The range of factors affecting food choices

Things to think about (p. 23)

Low-income families could maintain a healthy diet by finding alternatives to more expensive ingredients, such as using sunflower oil instead of coconut oil, and by replacing fresh ingredients with tinned or frozen ones. Supermarkets sell fresh foods at cheaper prices when they are near their sell-by dates. Families could also buy foods which would normally be out of their price range. Foods that are easy to grow at home or year-round are generally easier to find and cheaper to buy.

Check your understanding

- 1) A 2) A 3) C 4) D (1 mark for each correct, max. 4 marks)
- 5) 1 mark for each correct, max. 3 marks
Only one nutrient for each need is identified.
- Total fat / sugar
 - Salt / sodium / saturated fat / total fat / trans fat
 - Saturated fat
- 6) Any two from: (1 mark for each correct, max. 2 marks)
- During celebrations, people eat more food in general.
 - During celebrations, new, unknown foods can be introduced.
 - During celebrations, people tend to choose foods of higher energy content.
 - Celebration-specific foods are often higher in fats than everyday food.
 - Celebration-specific foods are often higher in sugars than everyday food.
 - Celebrations often require special, festive foods, which are not eaten during everyday life.
 - People may choose to drink more alcohol.
 - Or any other suitable answer.
- 7) Any three from: (1 mark for each factor identified, 1 mark for a relevant description, max. 6 marks)
- Factor:** lifestyle
 - How to select recipes:** check how busy the members of the family are and calculate their energy needs; then choose products which are the most suitable for the family. If the family is very active, high in dietary fibre if the family is not so active but still needs energy.
 - Factor:** cost
 - How to select recipes:** as the family is of low-income, it is important that the diet is of good quality but also of low price; for this reason, it might be better to choose cheaper ingredients such as soya, beans and legumes, and eggs (which are fairly cheap), and red meat (due to the high price of meat); the diet could also include dairy products such as milk, which is cheap and provide many necessary nutrients; also, the most expensive ingredients could be replaced by cheaper substitutes, e.g. olive oil with sunflower oil, to lower the cost of the diet.
 - Factor:** availability of food
 - How to select recipes:** it may be a good idea to choose the foods which are readily available. For example, seasonal foods – as these are usually cheaper – and offered in abundance. It could also be to bulk-buy products to create various recipes (e.g. dough, pasta or potatoes).
 - Factor:** health condition
 - How to select recipes:** all foods and dishes should be suitable for all family members. For example, they should be gluten-free if someone is suffering from coeliac disease, and low in fat and sugar if someone has diabetes. The recipes should also follow the healthy eating guidelines in terms of food groups.
 - Factor:** personal preferences
 - How to select recipes:** all foods and dishes should appeal to all family members. Consider their likes and dislikes when designing a menu; for example, do not select recipes based on onion if nobody in the family likes onion.
 - Factor:** ethical and moral concerns
 - How to select recipes:** when selecting recipes, one should take into account if any family members are vegetarian or vegan; the recipes can then be selected to either cater for all (e.g. family members eat the same dish) or so that the ingredients of animal origin can be separated. For example, if one family member is vegetarian, it would not be suitable to cook two different dishes (one vegetarian, and one non-vegetarian) as this would increase the cost, which is an important factor for a low-income family.

Accept other suitable answers.

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How religion affects food choices

Things to think about (p. 26)

Consider that Islamic law forbids eating pork only, while most Hindu are vegetarians and avoid alcohol.

Check your understanding

1) A 2) C 3) D (1 mark for each correct, max. 3 marks)

4) 1 mark for each correct, max. 3 marks
Only one suggestion is needed for each row.

Beef mince	It has to be ensured that the animal was killed in the proper way. If not, the beef has to be replaced with kosher beef or a protein alternative.
Beef stock	Beef stock doesn't need to be replaced or modified, as Jews can eat it. It follows Jewish laws surrounding kosher.
Milk	If beef is used in a recipe, milk has to be replaced, e.g. with plant-based milk.

Accept other suitable answers.

5) 1 mark for a nutrient identified and 1 mark for a relevant justification, max. 2 marks
Any one from:

- **Protein** – complete protein is present in animal foods, such as meat, fish, eggs, and plant-based foods such as soya and quinoa; since many Hindus are strict vegetarians, they get complete protein from the foods they eat (these include milk and dairy, and plant-based foods).
- **Vitamin B12** – vitamin B12 comes exclusively from animal-derived foods and is often found in insufficient quantities just from milk and dairy.
- **Vitamin D** – vitamin D is provided in a diet with fish and fish oil, whole milk, and fortified products. Depending on the amount of animal-derived foods in the Hindu diet, it can be very low.

Other suitable answers may be accepted.

6) Any three from: (1 mark for each correct, max. 3 marks)

- When selecting recipes, pay attention to the meat content of the dish/meal.
- The dishes cannot include any pork, pork blood or gelatine.
- The dishes cannot be made with the use of pork fat (lard).
- Pay attention to the alcohol content of food, as Muslims cannot drink any alcohol.
- Pay attention to how the meat was obtained, as only halal meat can be eaten.
- The food and beverages must be caffeine-free, as Muslims should also avoid caffeine.
- Pay attention to the time of meals; for example, during Ramadan food can only be eaten after sunset.
- Accept other suitable answers.

Ethical and moral beliefs linked to food choice

Things to think about (p. 32)

The link between GM foods and their role in preventing food shortages is the potential to grow pest- and disease-resistant crops. This would, potentially, make food more available. There is also the possibility of creating foods with a longer shelf life which can have its nutritional value altered. Using GM crops can also potentially create higher yields of biofuel. Some people are against biofuel and feel that growing large amounts of GM crops will increase allergies. Some research has been conducted to find out possible long-term effects, such as weakening the immune system. There are concerns that windblown seeds or spores from GM crops can end up elsewhere, resulting in superweeds which are resistant to herbicides.

Check your understanding:

1) A 2) C 3) C (1 mark for each correct, max. 3 marks)

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- 4) 1 mark for each correct row (max. 3 marks). Other responses may be accepted.

Local community	e.g. bananas, oranges, kiwis and other imported foods, as foods which are produced locally (this helps to support local communities)
Animal welfare	e.g. eggs from barn- or cage-bred hens and milk from intensively reared cows. Consumers would rather choose foods which were made with consideration for animal welfare (e.g. organic or free-range beef) or else become vegetarian/vegan.
Climate change	e.g. conventionally grown and reared foods and imported foods with a lower carbon footprint, e.g. locally produced foods.

- 5) Any three from (1 mark for indicating how the concerns influence food choices and 1 mark for explanation/description, max. 6 marks):

- choosing foods from sustainable sources (e.g. fish, palm oil) – the consumer chooses foods produced in a way that limits the negative impact on the environment
- choosing animal-derived foods (e.g. eggs, milk, meat) which are labelled as Assured, Red Tractor, etc. – many people care about the conditions the animals are kept, and, therefore, will choose to buy such products to support animal welfare
- choosing foods which were not genetically modified – GM foods have a large impact on the environment, decreasing species diversity and leading to extinction of less-immune species. Non-GM foods can help to support species diversity and natural habitats
- choosing Fairtrade foods – as they are also often produced in a sustainable way
- choosing seasonal foods and locally produced foods – as this helps to lower the carbon footprint, helping to limit the impact on the environment and decreasing production of carbon dioxide

Other suitable answers may be accepted.

How Medical reasons (intolerances and allergies) affect food choice

Things to think about (p. 36)

Allergens can be hidden within food and be served unknowingly to an allergic individual. Symptoms, such as hives, sneezing or anaphylactic shock. Individuals could be served food containing allergens without their knowledge, such as:

- nuts or sesame seeds within sauces (e.g. satay sauce)
- sulphites used as preservatives within packaged or processed foods or in frozen products
- shellfish or crustaceans within sauces and soups; soya beans within a variety of foods
- cereals such as wheat within soups, sauces, gravy and thickeners
- eggs and milk within a variety of foods; or celery within vegetable stock and soups

Serving food that has been in contact with an allergen to an allergic individual can have serious consequences. For peanut allergy sufferers (dust from peanuts or other nuts can cause a fatal reaction), food must be kept away from food that will be served to an allergic individual. People with allergies must be asked about every food item they order – it is a requirement for all caterers to supply these to customers. To prevent an allergic reaction occur, that catering staff, including the first aiders, would not be trained. Allergic individuals are at risk if they do not make their allergy known or carry medication in case of an emergency.

Check your understanding

- 1) B 2) C 3) 1 mark for each correct, max. 3 marks)

- 4) 1 mark for each correct row, max. 2 marks

- Food allergy-related agent: egg, milk (one from)
- Food intolerance-related agent: milk (lactose)

- 5) 2 marks for a detailed explanation, 1 mark for a basic explanation, max. 2 marks
Indicative content:

- During production of cheese, lactose in milk is fermented into lactic acid. For lactose-intolerant people, cheese contains very little or no lactose, so poses no threat for a lactose-intolerant person.
- During production of cheese, protein in milk coagulates and denatures, but is still present. In fact, the protein content of cheese is much higher than that of milk. For this reason, people with milk protein allergies cannot eat any dairy products.

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Chapter 2: Quiz-ine

1. Allergen
2. Intolerance
3. Organic
4. Muslim
5. Seasonality
6. PAL
7. Overweight
8. Ethical
9. Lifestyle
10. Free-range
11. Fairtrade
12. Kosher
13. Metabolic

The shaded squares reveal these words related to animal welfare

Chapter 3: Food labelling and marketing

Food labelling

Check your understanding

- 1) A 2) B 3) C (1 mark for each correct, max. 3 marks)

- 4) 1 mark for each correct, max. 3 marks

Any three from:

- Name of the food
- List of ingredients
- Quantitative ingredients
- Net quantity
- Nutrition labelling
- Date marks
- Name and address of the manufacturer
- Country of origin
- Storage conditions
- Added water
- Type of treatment used
- Content of GM ingredients

- 5) 1 mark for each description (max. 2 marks), 1 mark for each example (max. 2 marks)
Indicative content:

- **Nutrition claim:** a statement which refers to the content of an ingredient in a food.
Examples could include: source of protein, low fat, contains vitamin C or no added sugar.
- **Health claim:** a statement which shows the direct link between consumption of a food and health benefits. Examples could include: helps to lower blood cholesterol levels, supports heart health or helps to boost immunity.

Accept other suitable examples.

- 6) 1 mark for explaining how to calculate the amount of each of the nutrients (max. 1 mark), 1 mark for explaining how to calculate the calorie intake (max. 1 mark) (total max. 4 marks)
Indicative content:

- A healthy diet should provide on average 2,000 kcal for a woman and 2,500 kcal for a man. These calories come from carbohydrates (50%), fats (35%) and proteins (15%).
- The number of calories from carbohydrates for a woman would be 1,000 kcal (equivalent to 250 g carbohydrates), and for a man 1,250 kcal (equivalent to 312–333 g carbohydrates).
- The number of calories from fats for a woman would be 700 kcal (78 g fats).
- The number of calories from proteins for a woman would be 300 kcal (75 g proteins).

The answer should include a reference to either a woman or a man (reference to both is acceptable). The amounts above were calculated using the following indicators: 1 g of carbohydrate provides 4 kcal; 1 g of fat provides 9 kcal; 1 g of protein provides 4 kcal.

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Food marketing

Things to think about (p. 47)

Advertising can affect a consumer's food choice through descriptive words, colourful product appearance, and so on. Advertising can also make us want to buy products. Claims about diet, lifestyle, nutrition, or by appealing to our ethical or moral judgement.

Check your understanding

- 1) C 2) A (1 mark for each correct, max. 2 marks)
- 3) 2 marks for a detailed explanation, 1 mark for a basic explanation, max. 2 marks
Indicative content:
- This is a marketing technique.
 - In this technique, the most expensive products are usually placed at the shelf closest to the consumer.
 - It means that items aimed at adults are placed at their eye level, and items aimed at children are placed a bit lower.
 - Items aimed at toddlers are usually marketed at their parents, since they are the ones who buy for them.
 - Parents tend to buy things more often if those items are placed comfortably at their eye level.
 - Other items, e.g. cheaper or less attractive ones (e.g. value brands), are often placed on lower shelves and are more difficult to reach.
- Other suitable answers may be accepted.
- 4) 1 mark for the correct answer (max. 1 mark)
Point of sale
- 5) 1 mark for each correct statement, max. 5 marks
Any five from:
- An example of such technique is using pictures of popular cartoon characters on packaging aimed at kids.
 - Packages of these products are often very colourful and eye-catching.
 - Items aimed at children are often placed at their eye level (lower shelves).
 - Items aimed at children are often placed on special stands, which are specifically designed for the youngest consumers.
 - Items aimed at children are often described as 'natural' or bear health or nutrition claims, e.g. the given product is good for children, e.g. provides calcium and supports the growth of children.
 - Point of sale technique is also often used to sell products for children, such as toys, games, etc.
 - All these techniques are appealing to children and make them pester their parents for specific products.
 - Products for toddlers usually bear specific vocabulary and are aimed at their parents.
 - The point of this is to convince them that the product is the best for their own good and their proper growth and development.
- Other suitable answers may be accepted.

Chapter 3: Quiz-line

1. Point of sale
2. Best before
3. Saturates
4. Nutrient density
5. Ingredients
6. Origin
7. Product placement
8. BOGOF
9. Water
10. Use by
11. Reference intake

The shaded squares reveal these words: **pester power**

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