Nutrition Umbrella

Macronutrients
- Carbohydrate
- Fat
- Protein

Micronutrients
- Vitamins
- Minerals

WATER
Beans, pulses, fish, eggs, meat and other proteins (pink section)
- Help the body to grow and stay healthy.
- Eat a range of meat, fish, eggs, nuts, seeds, tofu, beans, and pulses.

Fruit and Vegetables (green section)
- Aim for at least 7 portions a day
- Fresh, dried, frozen, canned and juiced they all count.

Potatoes, bread, rice, pasta and other starch carbohydrates (yellow section)
- Every meal should contain one of these
- Adds fibre, bulk and carbohydrates to the diet

The Eatwell Guide

Dairy and Alternatives (Blue section)
- Help bones and teeth to grow strong and stay healthy.
- Try lower-fat options.
- Provides calcium
- Provides protein
- Provides B vitamins

Oils and spreads
- Eat only small amounts of foods in this group
- Choose unsaturated oils (olive oil, vegetable oil, rapeseed oil) and unsaturated vegetable fat spreads
Protein

**Functions**
- Essential for the growth and repair of body tissue.
- It is crucial to the healthy functioning of the body.
- Growth especially in children and pregnant women.
- Repair of body tissue after illness, accidents and surgery, also renewal of cell proteins for all ages.
- Enzymes, vital for metabolism.
- Hormones (regulates).
- Secondary source of energy.

**What is protein? Macronutrient**

*Made up of Amino Acids.*

*There are 20 in total.*

12 non essential – This means these can be made by the body (not essential that we eat them).

8 Essential – Cannot be made by the body - Must get them from foods on a daily basis.

<table>
<thead>
<tr>
<th>Animal</th>
<th>Vegetable</th>
</tr>
</thead>
<tbody>
<tr>
<td>All meats</td>
<td>Soya Beans</td>
</tr>
<tr>
<td>Fish</td>
<td>Pulses</td>
</tr>
<tr>
<td>Cheese</td>
<td>Beans</td>
</tr>
<tr>
<td>Milk</td>
<td>Nuts</td>
</tr>
<tr>
<td>Eggs</td>
<td>Quorn</td>
</tr>
</tbody>
</table>

**HBV - High Biological Value** - These contain all 8 essential Amino acids

**LBV - Low Biological Value** - These DO NOT contain all essential Amino Acids

**Food Combining** - With careful meal planning, you can mix HBVs with LBVs or combine different LBV foods to create a complementary protein that contains all the essential amino acids your body needs. Good examples are beans on toast, lentil soup or rice and bean salad.
Protein

**Deficiency**
A deficiency of protein would cause:
- slow growth in children’s physical development
- May lose some of their hair
- Their skin and nails will be in poor condition
- Develop infections easily due to weaker immune system
- digestive problems due to insufficient enzyme production
- malfunction of the liver
- muscles to become weak, limbs thin and stomach distended.

**Excess**
Protein contains different chemical elements, including nitrogen. Too much nitrogen in the body is dangerous, so it is removed from the body in urine, which is excreted.

If the diet contains too much protein, the liver and kidneys have to work harder to get rid of the nitrogen. This puts them under great stress and could cause them to be harmed.

**Kwashiorkor**
Kwashiorkor is a protein energy malnutrition disease that occurs in children more frequently in less developed countries, where they are weaned from breast milk to a low protein diet.

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<table>
<thead>
<tr>
<th>Age/Gender</th>
<th>Grams of protein per day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child (1-10 years old)</td>
<td>14.5g-38.3g</td>
</tr>
<tr>
<td>Teenager (male aged 11-18)</td>
<td>42.1g - 55.2g</td>
</tr>
<tr>
<td>Teenager (female aged 11-18)</td>
<td>41.2g - 45.0g</td>
</tr>
<tr>
<td>Adult Male (up to 50)</td>
<td>55.5g</td>
</tr>
<tr>
<td>Adult Female (up to 50)</td>
<td>45.0g</td>
</tr>
<tr>
<td>Elderly</td>
<td>46.5g - 53.3g</td>
</tr>
</tbody>
</table>
Fats

Functions

• Fats are used by the body for energy and also form part of the structure to cells.
• Stored under the skin, fat helps insulate the body against the cold.
• Our vital organs, such as kidneys are protected by a layer of fat.
• Fat is a source of fat-soluble vitamins (ADEK).
• We eat fat because it gives food texture and flavour.
• Helps gives a feeling of fullness!

Key Facts

• Lipids is a general term for both fats and oils. Oils are fats that are liquid at room temperature.
• Fat is a macronutrient.
• Both are high in calories.
• However both are important for health and wellbeing.
• 2 different sources of fat – namely Animal and Plant.

Key Facts (cont.)

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• 2 different sources of fat – namely Animal and Plant.

Animal

<table>
<thead>
<tr>
<th>Animal</th>
<th>Plant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chicken</td>
<td>Avocado</td>
</tr>
<tr>
<td>Suet/lard</td>
<td>Pears</td>
</tr>
<tr>
<td>Dairy Products</td>
<td>Nuts</td>
</tr>
<tr>
<td>Fish (Oily)</td>
<td>Seeds</td>
</tr>
<tr>
<td>Beef</td>
<td>Sunflower Oils</td>
</tr>
</tbody>
</table>

Glycerol

Fatty Acid

Fatty Acid

The above diagram is a picture of a fat. This shows its chemical structure. Fats include, Glycerol, Fatty Acids, Carbon, Hydrogen and Oxygen.

 Unsaturated

Each carbon atom is combined with 2 hydrogen atoms.
Solid at room temperature.
Mainly found in animal foods.
**NOT GOOD FOR US!!**
Links with CHD, HBP, Diabetes and Obesity.

 Saturated

2 types: Monounsaturated and Polyunsaturated fatty acids.
Usually soft or liquid at room temperature.
Lower melting point.
Double Bonds - **Good for you!**
Fats

**Trans Fatty Acids**

Man made molecules produced when hydrogen is added to vegetable oils.

This process is called hydrogenation

Used to make solid margarines from oils.

BAD FOR YOU!! CVD (CARDIO VASCULAR DISEASE) and may increase risk of cancer!!

**Essential Fatty Acids (EFA's)**

The body can make most of the fats it needs from the diet. However, two essential fatty acids, **linolenic** and **linoleic acid**, cannot be made in the body and must be obtained from food.

These basic fats are found in plant foods and are used to build specialized fats called **omega-3** and **omega-6** fatty acids.

**Key points**

- Don't be scared of the science!
- Fat is a concentrated form of energy
- Excess fat in the diet is stored as body fat
- **35% of fat** total intake per day of our total diet
- Saturated fats bad for you - Links with cholesterol

**Key Words**

- Essential Fatty Acids
- Hydrogenation
- Lipids
- Monounsaturated
- Polyunsaturated
- Linolenic
- Linoleic

**Omega 3 – Oily Fish**

**Omega 6 - Vegetables**
Carbohydrates

Functions
- They provide the body with energy for physical activity
- They provide the body with energy to maintain bodily functions
- They provide dietary fibre to help digestion (NSP)
- They sweeten and flavour foods
- They are divided into sugars and starches also known as simple and complex carbohydrates

Key facts
- Carbohydrates are important macronutrients formed from carbon, hydrogen and oxygen
- We need 50% of our total diet made up of carbohydrates.
- Use to provide energy and during digestion they are broken down into their simplest form, glucose

There are 3 forms of carbohydrates:
- Sugar
- Starch
- NSP (Fibre)
Carbohydrates

Monosaccharide examples
- **Glucose** – this is one of the simple sugars
- Found where? – Fruits and vegetables
- Note: Although athletes often consume in a tablet form to provide a fast energy boost.

Disaccharides – 1 double bond within their chemical structure

Disaccharides examples
- Lactose – this is the disaccharide found in milk which some people think gives milk it slightly sweet taste.

Monosaccharide examples
- **Fructose** – is smaller in structure than glucose
- Found where? – some fruits but mainly in honey
- Sweetest of all sugars, and is used by manufacturers instead of sucrose (less sugar content)

Disaccharides – 2 double bonds within their chemical structure

Disaccharides examples
- **Maltose** – A natural sugar found in Other pistachios, sweet potatoes, and fruits such as kiwi, dates, blueberries and cherries.
- Malt is sometimes used in some food production and as a dietary supplement.
- Malt, an ingredient in beer (making), contains maltose
- Not as sweet as sucrose (1/3)

Monosaccharide examples
- **Galactose** – formed in the body during digestion of lactose
- Where from? – foods which contain milk and sugar

Disaccharides examples
- **Sucrose** – is the most common disaccharide. This is the sugar you use at home!
- In industry it is known as sugar cane.
- It provides the body with energy
- Examples: granulated, icing, syrup, treacle or brown!
Carbohydrates

How do we eat sugar?

We eat sugar in two different forms:

**Intrinsic** - found inside the cells of fruit and vegetables

**Extrinsic** - in the ones you can physically see (cakes, biscuits, cane)

Problems with eating too much sugar

- **Tooth decay** - most common. This is caused by bacteria in your mouth as it feeds on sucrose and produces acid!
- **Diabetes** - Type 2
- Intrinsic sugars are less harmful as it is easier for the body to absorb them.

Polysaccharide examples: **Starches**

These are complex carbohydrates formed from hundreds of glucose molecules
Found where? - Bread, rice, pasta, cereals and grains.
Starches take longer than sugars for the body to digest, So you feel “full” for longer.
50% of our diet should be made up of these

Functions of starch in the diet

- Broken down slowly into simple sugars to provide energy.
- Adds bulk to our diet.
- Makes you feel “full” for longer.
- Excess is converted into fat.

Fibre/NSP (Non starch Polysaccharide)

Non digestible cellulose in plant foods
It cannot be digested so passes straight through the digestive system.
Helps push other food through the system.
Cleans the intestine walls of bacteria
We need 18g day
Can be soluble or insoluble

Functions

- Holds water and keeps faeces soft.
- Helps prevent various bowel disorders, constipation, bowel cancer, appendicitis and piles.
- Helps to control your weight & lower cholesterol.
## Vitamins

### Functions
- To maintain health
- To help prevent deficiency diseases such as rickets and Beri Beri
- To regulate the repair of body cells
- To help combat the ageing process
- To help process carbohydrates and release energy in the body.

### Beri Beri
**Deficiency of Vitamin B1 (Thiamine)**

**Symptoms of dry beriberi include:**
- Difficulty walking.
- Loss of feeling (sensation) in hands and feet.
- Loss of muscle function or paralysis of the lower legs.
- Mental confusion/speech difficulties.
- Pain.
- Strange eye movements (nystagmus)
- Tingling.
- Vomiting.

### Fat Soluble
- Vitamins ADEK (You do not need to know about E&K)
- Found in the fat of foods
- Stored in the liver
- Used in the body when needed

### Water Soluble
- Dissolve in water
- The include B group and C.
- They cannot be stored in the body (as they would dissolve)
- So foods which contain these must be eaten regularly

### Rickets
**Deficiency of Vitamin D AND Calcium**

**Symptoms of Rickets include:**
- Rickets can lead to bone pain, poor growth and deformities of the skeleton, such as bowed legs, curvature of the spine and thickening of the ankles, wrists and knees.
- Children with rickets are also more likely to fracture their bones.
<table>
<thead>
<tr>
<th>Vitamin</th>
<th>Sources</th>
<th>Functions in the body</th>
<th>Effects of deficiency (not enough in the body)</th>
<th>Effects of excess (too much in the body)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (Retinol)</td>
<td>Animal Sources, eggs, liver</td>
<td>Vision, Bone growth and healthy immune system</td>
<td>Night Blindness, Weak immune system and slow growth rate</td>
<td>Poor bone strength</td>
</tr>
<tr>
<td>A (Carotene)</td>
<td>Animal and vegetable sources</td>
<td>Can make own vitamin A, Aids digestive system</td>
<td>Eye problems, dry skin and hair</td>
<td>Can interfere with absorption of vitamin K</td>
</tr>
<tr>
<td>D (Cholecalciferol)</td>
<td>Sun, Oily fish, meat, meat products</td>
<td>Increase flow of calcium to bloodstream - teeth and bones, Allows minerals to be absorbed</td>
<td>Bones thin and brittle, Liver and kidney disorders, Rickets</td>
<td>Skin Cancer, Can lead to kidney damage</td>
</tr>
<tr>
<td>E</td>
<td>Mainly found in plant foods such as Soya, corn oil, olive oil, nuts and seeds</td>
<td>Antioxidant (these help prevent chemicals picking up oxygen so they cannot damage the body's cells)</td>
<td>RARE</td>
<td>RARE</td>
</tr>
<tr>
<td>K</td>
<td>Plant and animal foods such as green leafy veg, liver, cheese green tea (also make in the larger intestines by bacteria)</td>
<td>Enables blood to clot when the body is injured</td>
<td>RARE - however some babies in the UK have to be given a vitamin K injection when born</td>
<td>RARE</td>
</tr>
<tr>
<td>Vitamin Water soluble</td>
<td>Sources</td>
<td>Functions</td>
<td>Effects of deficiency</td>
<td>Effects of excess</td>
</tr>
<tr>
<td>-----------------------</td>
<td>---------</td>
<td>-----------</td>
<td>-----------------------</td>
<td>------------------</td>
</tr>
<tr>
<td><strong>B1 - Thiamin</strong></td>
<td>Pork, Liver, Whole grains</td>
<td>Helps release energy from carbohydrate foods during respiration</td>
<td>Metal confusion, muscle weakness, impaired growth</td>
<td>Abnormal liver function</td>
</tr>
<tr>
<td><strong>B2 - Riboflavin</strong></td>
<td>Liver, Milk, Dark green vegetables</td>
<td>Helps release energy from carbohydrate, protein and fat foods during respiration</td>
<td>Cracks at corner of the mouth, dermatitis</td>
<td>Abnormal liver function, cramps</td>
</tr>
<tr>
<td><strong>B3 - Niacin</strong></td>
<td>Liver, fish, poultry, meat, peanuts</td>
<td>Helps release energy from foods during respiration</td>
<td>Skin Disorders, Weakness, irritability</td>
<td>Cramps, nausea, abnormal liver function</td>
</tr>
<tr>
<td><strong>Folate - Folic Acid B9</strong></td>
<td>Green leafy Vegetables, Meats, fish</td>
<td>Works with B12 to make red blood cells</td>
<td>Fatigue, cramps, difficulty in sleeping</td>
<td>Nausea, decreased appetite</td>
</tr>
<tr>
<td><strong>Vitamin B12 - Cobalamin</strong></td>
<td>Liver, meat, fish, cheese and in fortified breakfast cereals (added by manufacture)</td>
<td>Works with folate to make red blood cells Healthy nerves</td>
<td>Anaemia</td>
<td>RARE - as can be stored in the liver for 2 years +</td>
</tr>
<tr>
<td><strong>C - Ascorbic Acid</strong></td>
<td>Citrus Fruits, Strawberries, Broccoli</td>
<td>Helps absorbed iron Maintain cells Antioxidant</td>
<td>Anaemia bleeding gums, wounds not healing Rough skin and scurvy</td>
<td>Diarrhoea, cramps, bloating</td>
</tr>
</tbody>
</table>
**Minerals**

**Iron**
- **Function:** Important for blood and muscles and the transportation of oxygen
- **Sources:** Liver, Red Meat and Egg Yolk
- **Deficiency:** Anaemia – Red blood cells lower than normal

**Calcium**
- **Function:** Important for strong teeth and bones.
- **Sources:** Milk and Milk products
- **Deficiency:** Weak bones (rickets) stunted growth.

**Phosphorus**
- **Function:** Essential for bone formation and nerve function
- **Sources:** Meat, Poultry and Fish
- **Deficiency:** Tiredness and possibly depression.
# Minerals

## Sodium

**Function:**
A mineral that regulates body fluid volume and concentration.

**Sources:**
Cheese, bacon, smoked meats, fish and processed foods.

**Deficiency:**
Effects the acid balance in your muscles and water however it is highly unlikely in the UK.

## Fluoride

**Function:**
Strengthens teeth against decay.

**Sources:**
Fish, tea, drinking water and toothpaste.

**Deficiency:**
Tooth Decay.

## WATER

The human body is about 65% water.
We need a lot of water each day. Some one can die within hours if not enough is consumed. Lack of water can be more harmful than shortage of food.

**Functions of water**
- Regulate temperature (sweat evaporates and cools the body)
- Water helps flush out harmful toxins from the kidneys
- Water transports nutrients, o2 and co2 around the body.

In some areas of the UK, where the level of fluoride found naturally in water is low, fluoride is added to the supply of drinking water. This process is known as fluoridation.
Flour

- Wheat is made into flour. There is a large variety of flours available and they are used for making many different products.

- **Flours are described by their extraction rate** (how much of the whole grain is used)

- Wholemeal flour - 100% extraction rate - nothing has been removed - light brown in colour
- Brown Flour - 85-90% extraction rate - 10-15% of the grain is removed as bran - light brown in colour
- White flour - 70-75% extraction rate - the bran, germ, fat and some minerals have been removed. - white in colour

  *(In the UK white flour has to be fortified with Iron, calcium, thiamine and Niacin)*

- All flours are fortified with calcium.

**Definition** Fortification - process of adding nutrients to foods which have been lost in the processing stages of production.

Examples:
- Strong Flour - high gluten content
- Soft Flour - Lower gluten content
- Self raising Flour - Chemical raising agent added to it
- Gluten free flour - Protein has been removed (this is for people who have coeliac disease)
- Gluten - Protein in wheat products.
Other Cereals

**Rice**

2 main different types:

*Long grain* - The grains remain separate when cooked - basmati rice

*Short Grain* - Tend to clump together when cooked often used in desserts (Rice pudding)

**Maize**

Good source of Vitamin A

Corn on the cob is the most popular way to eat Maize

It can be grounded into white powder called Corn flour. This is used to thicken products.

**Oats**

Good Source of Carbohydrates, B vitamins, calcium and Iron.

Usually rolled rather than crushed.

Sold by grain (coarse, medium and fine) - all this means how thick/thin they are.

**Barley**

Good source of carbohydrate.

Used in the brewing industry

Can often be found in breakfast cereals as flaked barley.
Meat & Fish

**Structure of meat:**
Meat is the muscle of tissue of animals.
The muscles are fibres which are bundled together and surrounded by connective tissue.

**Why do we get different types of meat:**
The parts of animals which do the most work (neck and skin) have large long fibres. These tend to be tougher cuts of meat. They need long slow methods of cooking to make them tender.

**Classification of fish**
- White - Cod, Haddock, Plaice
- Oily - Sardines, Tuna, Trout
- Shell Fish - Prawns, Crab, Lobster

**Nutritional value of fish:**
- Protein
- Fat
- Minerals
- Vitamins A+D

**Why do we get different types of meat:**
Alternatively meat which has been processed (minced) this breaks down the fibres so they are much shorter and not as tough to eat.
Meat which comes from young animals or the parts of the animal that do not do as much work (breast, rump or ribs) have much shorter fibres. These can be cooked for much shorter amounts of time.
**Vegetables and their colours**

Very similar to fruits. The only difference is that vegetables can have different thicknesses of cellulose and contain more water.

They come in a variety of colours. The colour depends on:

1. **Chlorophyll** – provides the green colour
2. **Carotenoids** – Yellow and orange
3. **Anthocyanin’s** – Red and blue

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**Categories of fruit**

**Citrus** – Lemons, Limes and oranges

**Soft or berry fruits** – Raspberries, strawberries, blueberries and blackcurrants

**Hard fruit** – Apples and Pears

Some fruits do not fall into any category – Kiwi, Pomegranate, Melon and Banana.

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**Nutrient** | **Sources**
--- | ---
Vitamin C | Rich sources – Blackcurrants
| Good sources – Citrus fruits, strawberries, gooseberries and raspberries.
| *Remember vitamin C is destroyed by heat.*
Vitamin A | Apricots
Carbohydrate | Found in the form of sucrose and fructose in ripe fruit. Fibre is also found in the skin and fibrous parts of the fruit.
## Fruits and Vegetables

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protein</td>
<td>Only found in pulses and beans. It is of LBV except soya beans.</td>
</tr>
<tr>
<td>Carbohydrate</td>
<td>Root vegetables and tubers are the best source of carbohydrate in the form of starch. Vegetables are a good source of fibre.</td>
</tr>
<tr>
<td>Vitamin C</td>
<td>Rich Sources – Watercress, sprouts, cabbage, green peppers Reasonable sources – Peas, bean sprouts, potatoes</td>
</tr>
<tr>
<td>B Vitamins</td>
<td>Pulses provide a good source of thiamine. Most vegetables contain some of the B group.</td>
</tr>
<tr>
<td>Vitamin A</td>
<td>Carrots and dark green vegetables.</td>
</tr>
<tr>
<td>Calcium and Iron</td>
<td>Found in some vegetables such as watercress, cabbage and spinach.</td>
</tr>
</tbody>
</table>
**Milk**

**Structure of Milk**
- Milk is mainly water. It is an emulsion and has tiny drops of fat suspended in it.
- As oil and water do not mix, the fat will rise to the top of the milk.
- This is seen in the cream line at the top of the milk.
- Most of the milk today that we buy is homogenised which means the fat is distributed evenly through-out.

**Homogenisation**
- This is where milk is forced at high pressure through small holes. This breaks up the fat globules in order to spread them evenly through-out the milk.

**Nutritional Value of Milk**
- Water - 86.4%
- Protein - 3.5%
- Fat - 3.8%
- Carbohydrate - 4.8%
- Vitamins and Minerals - 1.5%

**Nutrients**

<table>
<thead>
<tr>
<th>Nutrients</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protein</td>
<td>• HBV protein</td>
</tr>
</tbody>
</table>
| Fat       | • Varies depending on the type of milk  
• By law milk must contain 3% fat  
• Contains both saturated and unsaturated |
| Carbohydrate | • In the form of lactose  
• It does not taste sweet  
• Lactose free milk can now be purchased for those who have intolerance. |
| Vitamins  | • Vitamin A (retinol and carotene)  
• Vitamin D (more in the summer)  
• B vitamins 1,2,3 |
| Minerals  | • Calcium and Phosphorus |

**Types of milk**

**Whole Milk**
- Has nothing added or removed

**Semi Skimmed milk**
- Most popular in the UK
- 1.7% fat content

**Skimmed Milk**
- Fat content 0.1-0.3%
- More calcium than whole milk
<table>
<thead>
<tr>
<th>Minerals</th>
<th>Function in the body</th>
<th>Main food sources</th>
<th>Deficiency</th>
<th>Excess</th>
</tr>
</thead>
</table>
| Calcium  | Makes teeth and bones strong  
|          | • You need vitamin D for calcium to be absorbed  
|          | • Allows nerves and muscles to work properly  
|          | • Helps blood clotting | Milk, cheese, yogurt, green leafy veg | • Weak bones  
|          |                       |                   | • Rickets  
|          |                       |                   | • Muscles and nerve malfunction  
|          |                       |                   | • Blood will not clot | VERY RARE - but could cause kidney failure |
| Iron     | Makes haemoglobin (oxygen absorption) in red blood cells  
|          | • Vitamin C needed for iron absorption | Red meat, liver, brown bread, green leafy veg | Anaemia  
|          |                       |                   | Issues with babies (need iron stores from mum) | Too much is poisonous to the body |
| Sodium   | Controls amount of water in the body  
|          | • Helps body to use energy  
|          | • Controls nerves and muscles | SALT | Muscle cramps | High blood pressure  
|          |                       |                   | Strain on heart and kidneys |
| Fluoride | Strengthen bones and enamel in teeth and bones  
|          | • Prevents tooth decay | Fish and seafood, water, tea, toothpaste | Weak teeth and enamel  
|          |                       |                   | Tooth decay | Permanent yellow teeth |
| Iodine   | Produces the hormone thyroxin - which controls metabolic rate | Seafood, vegetables, milk and dairy foods | Swelling in the neck - Goitre | RARE |
| Phosphorus | Along with calcium makes teeth and bones strong  
|          | • Essential for energy release and other chemical reactions | Most fruit and vegetables | RARE | RARE |
## Functions of ingredients

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Function</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Flour</strong></td>
<td>Forms the main structure of a product due to its gluten content</td>
<td>• Bread (strong plain flour) - high gluten content.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Cakes (soft plain flour) - low gluten.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Crumble - topping</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Pastry - casing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Cakes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Sauces</td>
</tr>
<tr>
<td></td>
<td>Bulking</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Raising agent is self-raising flour is used to thicken (gelatinisation)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Fat</strong></th>
<th>Adds colour and flavour if butter or margarine is used. Holds air bubbles during mixing to create texture and volume Helps extend shelf life To shorten a flour mixture and make crisp or a crumbly texture Shortening Frying To form emulsions</th>
<th>• Cakes, biscuits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>• Cakes and biscuits</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Pastry</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Pastry</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Certain types of biscuits and pastry</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Stir fry</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Salad dressings</td>
</tr>
</tbody>
</table>

| **Oils**   | Binds Ingredients | • Salad dressings |
# Functions of ingredients

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Function</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Egg</td>
<td>Adds colour and flavour&lt;br&gt;Holds air when whisked&lt;br&gt;Forms an emulsion when mixed with fat&lt;br&gt;Binds ingredients together&lt;br&gt;Coagulating/setting&lt;br&gt;Glazing&lt;br&gt;Coating/enrobing</td>
<td>• Cakes&lt;br&gt;• Meringue, whisked sponge&lt;br&gt;• Mayonnaise&lt;br&gt;• Beef burgers, fish cakes&lt;br&gt;• Quiche&lt;br&gt;• Pastry&lt;br&gt;• Holding dry coatings such as breadcrumbs onto a surface and forming a barrier during cooking processes, e.g. fried breaded fish</td>
</tr>
<tr>
<td>Sugar</td>
<td>Sweetens&lt;br&gt;Develops flavour&lt;br&gt;Increases bulk of the mixture&lt;br&gt;Hold air&lt;br&gt;To aid fermentation&lt;br&gt;To preserve</td>
<td>• Desserts, cakes&lt;br&gt;• Soft brown sugar, or treacle in a gingerbread&lt;br&gt;• Cakes&lt;br&gt;• When creamed with fat, e.g. victoria sandwich&lt;br&gt;• Bread&lt;br&gt;• Jam</td>
</tr>
</tbody>
</table>
## Functions of ingredients

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Function</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquid</td>
<td>Acts as a raising agent when converted to steam</td>
<td>• Cakes and batters</td>
</tr>
<tr>
<td></td>
<td>Binds ingredients together</td>
<td>• Pastry</td>
</tr>
<tr>
<td></td>
<td>Glazing (milk)</td>
<td>• Scones</td>
</tr>
<tr>
<td></td>
<td>Enrich (milk)</td>
<td>• Bread</td>
</tr>
<tr>
<td>Salt</td>
<td>Helps develop flavour</td>
<td>Pastry</td>
</tr>
<tr>
<td></td>
<td>Strengthens gluten in flour and control the action of yeast</td>
<td>Bread</td>
</tr>
<tr>
<td></td>
<td>To preserve</td>
<td>Fish</td>
</tr>
<tr>
<td>Baking Powder</td>
<td>To aerate</td>
<td>To make a cake rise</td>
</tr>
<tr>
<td>Yeast</td>
<td>To aerate</td>
<td>To make bread rise</td>
</tr>
<tr>
<td>Fruit and vegetables</td>
<td>Adds colour and flavour</td>
<td>Savoury and sweet dishes</td>
</tr>
<tr>
<td></td>
<td>Adds texture</td>
<td>Savoury and sweet dishes</td>
</tr>
<tr>
<td></td>
<td>To thicken</td>
<td>When cooked and pureed - soups and sauces</td>
</tr>
<tr>
<td></td>
<td>Adds nutritional value</td>
<td>Tomato</td>
</tr>
<tr>
<td></td>
<td>To garnish</td>
<td>Potato on shepherds pie</td>
</tr>
<tr>
<td></td>
<td>To add a topping</td>
<td></td>
</tr>
<tr>
<td>Herbs and spices</td>
<td>Improve and add flavour</td>
<td>Curry, chilli</td>
</tr>
<tr>
<td></td>
<td>To garnish</td>
<td>Parsley</td>
</tr>
<tr>
<td>Gelatine</td>
<td>Setting</td>
<td>Jelly, chilled desserts - cheese cakes or soufflé</td>
</tr>
<tr>
<td>Chocolate, icings</td>
<td>To coat or decorate</td>
<td>Biscuits, cakes, desserts</td>
</tr>
</tbody>
</table>
# Functions of ingredients

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Function</th>
<th>Example</th>
</tr>
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<tbody>
<tr>
<td>Baking Powder</td>
<td>To aerate</td>
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</tr>
<tr>
<td>Yeast</td>
<td>To aerate</td>
<td>To make bread rise</td>
</tr>
<tr>
<td><strong>Fruit and vegetables</strong></td>
<td>Adds colour and flavour</td>
<td>Savoury and sweet dishes, savoury and sweet dishes, when cooked and pureed - soups and sauces</td>
</tr>
<tr>
<td></td>
<td>Adds texture</td>
<td></td>
</tr>
<tr>
<td></td>
<td>To thicken</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Adds nutritional value</td>
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</tr>
<tr>
<td></td>
<td>To garnish</td>
<td>Tomato</td>
</tr>
<tr>
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<td>To add a topping</td>
<td>Potato on shepherds pie</td>
</tr>
<tr>
<td>Herbs and spices</td>
<td>Improve and add flavour</td>
<td>Curry, chilli, parsley</td>
</tr>
<tr>
<td></td>
<td>To garnish</td>
<td></td>
</tr>
<tr>
<td>Gelatine</td>
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<td>To coat or decorate</td>
<td>Biscuits, cakes, desserts</td>
</tr>
</tbody>
</table>
**Diet, nutrition and Health**

- **Obesity**
  - Caused by not being in energy balance
  - Too many processed foods
  - BMI used to show whether overweight
  - Can cause serious affects on the body

- **Cardiovascular disease**
  - Can lead to CHD - links to a lot of salt in the diet
  - Smoking can cause CV disease
  - Sedentary lifestyle
  - Stress

- **Skeletal disease**
  - Rickets, Osteoporosis, tooth decay

- **Iron deficiency Anaemia**
  - Lack of iron supply in the diet to make haemoglobin
  - Common in teenage girls due to puberty and periods
  - Lack of energy, tiredness, pale complexion, feeling cold and weak muscles are all symptoms
  - Red meat main source of iron.

- **Type 2 Diabetes**
  - Body not being able to get a supply of glucose to and around the body
  - Can be prevented through diet, exercise and maintaining a healthy weight
  - Body can feel weak, weight loss, frequent urination and blurred vision are all symptoms
  - Reduce the amount of sugar intake
  - Stay Active
# Types of dietary requirements

<table>
<thead>
<tr>
<th>Dietary Requirements</th>
<th>Key points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetics</td>
<td>Medical condition where glucose in the blood stream is not balanced correctly. 2 types Insulin dependent (type 1) and type 2 which tends to occur in later life and is treated by change of diet/tablets. Diabetics must watch their sugar intake.</td>
</tr>
</tbody>
</table>
| Vegetarians             | 3 main reasons people become vegetarians, moral, religious beliefs and medical reasons. 2 main types  
  • lacto-ovo (do not eat meat, poultry, lard, fish oils or gelatine as it involved in killing an animal) and vegans. Will eat Quorn as an alternative.  
  • Vegans - avoid all animal products. |
| Coeliac (Gluten)        | A disease triggered by sensitivity to the protein GLUTEN found in Wheat, Barley and Rye. The gluten damages the lining of the intestine and prevents other nutrients from being absorbed. Gluten free products are available. |
| Calorie Controlled      | Where people watch the amount of calories they are consuming. Men should be having 2500kcal and women 2000kcal. People often reduce the amount they intake to lose weight usually because of BMI readings. |
| Nut Allergy             | Can cause Anaphylactic shock (difficulty breathing). Manufacturers now have to state whether nuts are present in their products. |
| Heart Disease (CHD)     | One of the main causes of death. Increased chances of this by smoking, high blood pressure, high cholesterol, obesity and low levels of exercise. Linked to the amount of fat you have in your diet. |
| Pregnancy               | Women must pay attention to, the amount of protein, Calcium, vitamin D, Folic Acid, Iron, vitamin C and Fibre they consume to aid the babies development. |
Why is food cooked?

Cooking causes chemical reactions e.g.: fats to melt (cakes), meat to soften (coagulate), Combined ingredients that work together

To develop the flavours in food

To make food safe to eat

To improve its shelf life

To give people a variety of foods in their diet.

To improve the texture and appearance

Some foods must be cooked thoroughly to avoid food poisoning bacteria

Destroy harmful micro-organisms such as bacteria and mould.

Cooking causes chemical reactions e.g.: fats to melt (cakes), meat to soften (coagulate), Combined ingredients that work together

Rice to soften (gelatinisation)

Sauces to thicken (béchamel)

Potatoes to go soft

Raw veg – cooked veg

To give people a variety of foods in their diet.
How is food cooked?

<table>
<thead>
<tr>
<th><strong>Conduction</strong></th>
<th><strong>Convection</strong></th>
<th><strong>Radiation</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat is transferred by contact with heat</td>
<td>Heat moves through convection currents. Hot air rises and cool air falls</td>
<td>Direct rays pass from the heat source to the food</td>
</tr>
<tr>
<td>Boiling, Baking, Frying, Microwaving, Roasting</td>
<td>Boiling, Baking, Frying, Roasting, Steaming</td>
<td>Microwaving, Grilling, BBQ</td>
</tr>
</tbody>
</table>

**How is Heat Transferred?**

There are THREE ways heat can move:

- Conduction
- Convection
- Radiation
# Methods of cooking

<table>
<thead>
<tr>
<th>Method of cooking</th>
<th>Method of heat transfer</th>
<th>Examples of suitable foods</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Boiling</strong> - cooking food in water at 100°C</td>
<td>Conduction -&gt; Convection</td>
<td>Eggs, rice, pasta, vegetables</td>
</tr>
<tr>
<td><strong>Braising</strong> - Sealing meat in hot fat, then cooking it slowly in a covered dish with a little liquid</td>
<td>Conduction -&gt; Convection</td>
<td>Meat, poultry, vegetables</td>
</tr>
<tr>
<td><strong>Poaching</strong> - Cooking food in a shallow pan of water or wine at just under boiling point</td>
<td>Conduction -&gt; Convection</td>
<td>Fish, eggs, fruit</td>
</tr>
<tr>
<td><strong>Simmering</strong> - Cooking food in a liquid just below boiling point, so it bubbles gently</td>
<td>Conduction -&gt; Convection</td>
<td>Vegetables, soups, stews, meat sauces</td>
</tr>
<tr>
<td><strong>Steaming</strong> - Cooking food in the steam rising from a pan of boiling water beneath</td>
<td>Conduction -&gt; Convection</td>
<td>Green vegetables</td>
</tr>
<tr>
<td><strong>Stewing</strong> - Cooking food by simmering gently in a covered pot either in the oven, on the hob or in a slow cooker</td>
<td>Conduction -&gt; Convection</td>
<td>Meat, poultry, sausage casseroles,</td>
</tr>
<tr>
<td><strong>Sautéing</strong> - Frying food gently in a little oil in order to soften the food and develop the flavour</td>
<td>Conduction</td>
<td>Onions, vegetables</td>
</tr>
</tbody>
</table>
# Methods of cooking

<table>
<thead>
<tr>
<th>Method of cooking</th>
<th>Method of heat transfer</th>
<th>Examples of suitable foods</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Shallow frying (pan frying)</strong> - Frying food in a shallow frying pan in a little oil</td>
<td>Conduction</td>
<td>Eggs, fish, sausages, burgers, onions</td>
</tr>
<tr>
<td><strong>Stir frying</strong> - Frying food for a short period of time in a Wok, using very little oil</td>
<td>Conduction</td>
<td>Finely cut vegetables, mushrooms</td>
</tr>
<tr>
<td><strong>Roasting</strong> - Cooking food in some oil or fat in a hot oven</td>
<td>Convection -&gt; Conduction</td>
<td>Meat, Poultry, root vegetables, potatoes</td>
</tr>
<tr>
<td><strong>Deep fat frying</strong> - Frying food in a deep pan of very hot oil, so that the food is fully immersed in the oil</td>
<td>Conduction -&gt; Convection</td>
<td>Fish, Chicken pieces, spring rolls, samosas</td>
</tr>
<tr>
<td><strong>Baking</strong> - Cooking food in a hot oven</td>
<td>Convection -&gt; Conduction</td>
<td>Cakes, breads, biscuits, cookies</td>
</tr>
<tr>
<td><strong>Grilling</strong> - Cooking food by intense radiant heat on a metal grid or grill rack either on a heated element or via BBQ charcoal or flames.</td>
<td>Radiation</td>
<td>Meat, poultry, fish, sausages, burgers</td>
</tr>
<tr>
<td><strong>Toasting</strong> - Cooking starch based products with dry heat from a grill or flame.</td>
<td>Radiation</td>
<td>Bread, buns, crumpets</td>
</tr>
</tbody>
</table>
# Methods of cooking

<table>
<thead>
<tr>
<th>Method of cooking</th>
<th>Method of heat transfer</th>
<th>Examples of suitable foods</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dry frying</strong> – Cooking food that naturally contains oil or fat in a frying pan without adding oil</td>
<td>Conduction</td>
<td>Minced meat, beef, lamb or pork.</td>
</tr>
<tr>
<td><strong>Microwaving</strong> – Cooking food by electromagnetic waves called microwaves in a microwave oven</td>
<td>Radiation</td>
<td>Sauces, cake and sponge puddings</td>
</tr>
<tr>
<td><strong>Induction cooking</strong> – A method of cooking where heat energy is transferred quickly to a pan through a specially designed ceramic cooking surface, over an induction coil that creates a magnetic current. Pan that are used on induction hobs must be made from metals that contain iron.</td>
<td>Conduction</td>
<td>Any types of foods that can be cooked on the hob</td>
</tr>
</tbody>
</table>
**Food science**

**Key terms:**
- **Coagulation** – To set.
- **Denaturation** – Breakdown of proteins into a different shape when referring to its chemical structure.
- **Chemical Bonds** – The structure that proteins are made up of.
- **Gluten** – Protein located in strong flour.
- **Foam** – When a gas (air) is trapped inside a liquid to create a foam.

**Key terms:**
- **Gelatinisation** – The swelling of starch granules when they are cooked with a liquid to the point where they burst and released starch molecules.
- **Dextrinisation** – The breaking up of starch molecules into smaller groups of glucose molecules when they are exposed to dry heat.
- **Caramelisation** – The breaking up of sugar (sucrose) when heated, which changed the colour, flavour and texture of the sugar as it turns into caramel.

**Key Terms**
- **Plasticity** – The ability to soften/shaped over a range of temperatures.
- **Shortening** – The ability of fats to shorten the length of gluten molecules.
- **Aeration** – The ability of some fats to trap air bubbles when beaten together with sugar.
- **Emulsification** – Keeping either water and oil together without letting it separate.

---

**Amino acids**

**Emulsifier**

- **Hydrophilic** – Loves Water
- **Hyrophobic** – Hates Water
# Raising agents

## Air

**Co2 (Carbon Dioxide)**

- **Steam**

- **Air** – is trapped in mixtures in a variety of ways
  - *Creaming* – mixing butter and sugar together
  - *Whisking* – electric or manually adding air to the mixture
  - *Rolling* – pastry
  - *Folding* – flour

## Co2 - Carbon dioxide gas is produced by either bicarbonate of soda and yeast

- Bicarbonate of soda produced CO2 when heated

## Yeast needs the right conditions to grow and produce CO2 which include

- Warmth
- Food
- Time
- Moisture

## Steam – when water is a liquid, the molecules join together with hydrogen bonds. When water is heated to 100°C, the hydrogen bonds break and molecules of H2O start to break free and are released into the air as steam (water vapour)

- Used in the following foods
  - Yorkshire puddings
  - Profiteroles (Choux Pastry)
  - Flaky pastry/puff pastry
# Food spoilage and contamination

**Microorganisms**

- They are tiny forms of life
- They can be both plants and animals
- Can only be seen under a microscope
- Also known as *Microbes*
- Found in water, air, dust, on people, on surfaces, on food, clothing etc

<table>
<thead>
<tr>
<th>3 main types of microorganisms</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Bacteria</td>
</tr>
<tr>
<td>- Moulds</td>
</tr>
<tr>
<td>- Yeast</td>
</tr>
</tbody>
</table>

*ALL CAUSE FOOD POISONING*

<table>
<thead>
<tr>
<th>Bacteria</th>
<th>Moulds</th>
<th>Yeasts</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Conditions to grow</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suitable temperature</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suitable PH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moisture</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**What are enzymes?**

- Natural substances (mostly proteins) found in foods and all living things
- Catalysts
- Cause ripening of fruit
- Cause animal tissue to break down
- Cause denaturation

**Enzymic browning**

The discolouration of a fruit or vegetable due to the reaction of enzymes with plant cell substances and oxygen from the air.

There are a few ways to prevent this from happening which include:

- Placing the fruit in something acidic such as lemon juice
- Blanching the fruit
- Placing in a mug/bowl of cold water
- Cook the food
- Cover the food in an air tight container to prevent oxygen reacting with the enzymes.

**Key words**

- **Germinate** - this is the process that happens when a spore from a mould starts to grow on a food.
- **Food spoilage** - Making food unfit and unsafe to eat.
- **Contaminate** - Making a food unsafe to eat by allowing it to come into contact with microorganisms that will grow and multiply in it.
- **Pathogenic** - Something that is capable of causing illness.
- **Food poisoning** - An illness caused by micro-organisms contaminating food.
- **High risk foods** - Foods that contain a lot of moisture and nutrients especially protein (cream, milk, eggs, meat fish) and easily support the growth of pathogenic micro-organisms particular bacteria. Also known as perishable foods.
- **Enzyme** - The name given to natural substances in living things that speed up chemical reactions.
- **Catalyst** - A substance that speeds up the rate of a chemical reaction.
## Food poisoning

<table>
<thead>
<tr>
<th>Name of food poisoning bacteria</th>
<th>Foods/drinks/places where it is often found</th>
<th>Symptoms of food poisoning</th>
<th>Incubation time (how long it takes for symptoms to appear)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Campylobacter</td>
<td>Raw poultry and meat Milk Untreated (dirty) water</td>
<td>Diarrhoea (often with blood in it) Abdominal pain Nausea Fever</td>
<td>48-60 hours</td>
</tr>
<tr>
<td>E.coli</td>
<td>Beef (Especially minced beef) and other meat Raw milk (milk that has not been heat treated) Untreated (dirty) water</td>
<td>Diarrhoea Abdominal pain Vomiting Fever Kidney damage or failure</td>
<td>12-24 hours</td>
</tr>
<tr>
<td>Salmonella</td>
<td>Raw and undercooked poultry, eggs and meat Raw milk (milk that has not been heat treated)</td>
<td>Diarrhoea Abdominal pain Vomiting Fever</td>
<td>12-36 hours</td>
</tr>
<tr>
<td>Listeria</td>
<td>Soft cheeses Cheese made from unpasteurised milk Salad vegetables Pates</td>
<td>Flu-like symptoms Can cause miscarriage in pregnant women or affect the unborn baby</td>
<td>1-70 days (can be very difficult to remember what has cause the illness)</td>
</tr>
<tr>
<td>Staphylococcus Aureus</td>
<td>People – Especially on hands, in their nose and mouth, on the skin, in cuts and skin infections. Raw milk, cold cooked meats and dairy products</td>
<td>Abdominal pain Vomiting Low body temperature</td>
<td>1-6 hours</td>
</tr>
</tbody>
</table>
**Key temperatures**

100°C - Boiling temperature

75°C - Minimum temperature to which meat needs to be cooked to

63°C - Hot holding temperature - minimum temperature for food to be served at from a retail outlet

37°C - Body temperature - optimum temperature for bacterial growth

5°C - 63°C - DANGER ZONE - Temperature range in which bacterial multiplies

5°C - Fridge temperature

0-5°C - Fridge temperature range

-18°C - Freezer temperature - bacteria is dormant
Packaging and the law

What information IS required by law?
- Product Name
- List of ingredients
- Storage instructions
- Date marking
- Manufacturers name and address
- Weight/volume
- Product description
- Instructions for use
- Place of origin
- Allergies

What is NOT required by law?
- Barcode
- Price
- Serving instructions
- Nutritional information

Q - Why include them then?
A - So the customer can make an informed decision

Date Markings
- Use by date - for high risk foods e.g. raw and cooked meat - date and month is shown
- Best before - for low risk foods e.g. biscuits, crisps - day/date/year is shown
- Display until - informs the retailer to remove from the shelves before it is unsafe to eat - few days before use by date.

Nutrition

Traffic light system

4+4 labelling
Buying and storing foods

Key terms

Cross contamination – How bacteria are spread from one source onto different foods

Shelf life – How long a food product will last before it becomes unsafe/unpalatable to eat.

Ambient – Room temperature 19-21°C

Tainted – When a foods picks up the smell or flavour of another food nearby which spoils its palatability.

<table>
<thead>
<tr>
<th>Type of storage</th>
<th>Foods stored</th>
<th>Key points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry foods storage</td>
<td>Cans</td>
<td>Well ventilated</td>
</tr>
<tr>
<td></td>
<td>Bottled foods</td>
<td>Free from moisture</td>
</tr>
<tr>
<td></td>
<td>Packaged foods</td>
<td>Must be protected from pests</td>
</tr>
<tr>
<td></td>
<td>Ingredients (flour etc)</td>
<td>Regularly check dates</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Once opened kept in sealed packets</td>
</tr>
<tr>
<td>Fridge (order)</td>
<td>High risk foods</td>
<td>Cheese and dairy</td>
</tr>
<tr>
<td></td>
<td>Perishable foods - fruits</td>
<td>Cooked meats/pies and pates</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Raw meats, poultry and fish</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Salads in lidded boxes</td>
</tr>
<tr>
<td>Freezer</td>
<td>* rating</td>
<td>No moisture</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Clearly labelled</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Do not freeze for too long</td>
</tr>
</tbody>
</table>
What to look for when buying different types of food

- Bright red gills
- Firm flesh
- Clear, shiny eyes that are not sunken
- Moist skin but not slimy
- Firmly attached scales - not loose or flaking off
What to look for when buying different types of food

- Not too much fat
- A bright red or pink colour
- A fresh smell
- Moist flesh, but not wet or slimy
- A firm, springy texture
What to look for when buying different types of food

- A good, bright colour
- Undamaged skin
- A smooth, unwrinkled skin
- No mould growth
- A firm, crisp texture (not wilted and soft)
- Not too much soil on the skin of root vegetables
Chopping boards

- Raw meat/poultry
- Raw fish
- Cooked meat/fish/poultry
- Vegetables (root)
- Salad/fruit
- Bakery items/dairy foods
Factors affecting food choice

- Health
- Physical activity level
- Nutrition
- Culture
- Tradition
- Ethics
- Moral beliefs
- Religion
- Food preferences
- Eating habits
- Availability/seasonality
- Lifestyle
- Cost
- Enjoyment
- Celebration/occasion
- Medical conditions
- Time of the day/time available to cook food
- Enjoyment
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- Medical conditions
- Availability/seasonality
- Lifestyle
Food choices related to religion and culture

Buddhism

Principles and beliefs in relation to food

The Buddha instructs Buddhists to stop and think about the foods they are eating in 5 ways
1. What is food
2. Why we eat food
3. Where food comes from
4. When food should be eaten
5. How food should be eaten

Buddhism considers living things to be sacred and this belief means that many Buddhists are vegetarian or vegan. Violence towards animals is considered to cause human aggression, so most Buddhists follow the principle of Ahimsa (non violence or harmlessness) and avoid all foods related to processes where animals are harmed.

Foods that CANNOT be eaten
Some Buddhists avoid meat and dairy products whilst others only avoid meat.
No alcohol

Special occasion linked to food
Buddhist monks fast (do not eat any food) during the afternoons
# Food choices related to religion and culture

## Christianity

### Principles and beliefs in relation to food
- Food and drink is regarded and celebrated as part of God creation.
- The freedom to eat and drink healthily is regarded as part of the salvation that Jesus brought to men and women.
- There are no strict views about food and drink that modern Christians are expected to obey.
- Fasting is practiced by some Christians as a way of remembering people who are starving or malnourished.

### Foods that CANNOT be eaten
- No restrictions

### Special occasion linked to food
- **Shrove Tuesday (Pancake day)** - This occurs in February or March on the day before Ash Wednesday, which is the first day of Lent. Traditionally on Shrove Tuesday, people use up the foods that are not allowed to be eaten during Lent, including ingredients used to make pancakes: Butter, cream and eggs.
- **Lent** - 40 days and nights before the celebration of Easter, Christians avoid consuming certain foods and drinks.
- **Good Friday** - Some Christians avoid eating meat. Hot cross buns are eaten to celebrate the end of Lent and remind Christians of the crucifixion of Jesus and the spices that were put onto his body afterwards.
- **Easter** - Easter eggs are eaten to celebrate new life and represent Jesus’ empty tomb.
- **Christmas** - Special food and meals are eaten to celebrate the birth of Jesus, including mince pies, roast turkey or goose, roasted potatoes, carrots, parsnips, Brussel sprouts, cranberry sauce, stuffing, Sausages wrapped in bacon (pigs in blankets), gravy, Christmas pudding and mulled wine.
Food choices related to religion and culture

**Hinduism**

<table>
<thead>
<tr>
<th>Principles and beliefs in relation to food</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Food is believed to contain particular energies that people take in when they eat.</td>
</tr>
<tr>
<td>• Many Hindus are vegetarian, but it is not compulsory not to eat meat.</td>
</tr>
<tr>
<td>• Some Hindu communities practice fasting.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Foods that CANNOT be eaten</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beef: The cow is held in high regard as a symbol of abundance and so it is not eaten by Hindus. The cow is seen as sacred.</td>
</tr>
<tr>
<td>Onions and Garlic are avoided or only eaten occasionally as they are thought to affect the search for spiritual enlightenment. This also applies to alcohol.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Special occasion linked to food</th>
</tr>
</thead>
<tbody>
<tr>
<td>Holi - This festival celebrates the start of spring. There is much dancing and singing and the throwing of coloured powder paint.</td>
</tr>
<tr>
<td>Diwali - The festival of lights. This happens in October/November. Many Indian sweets called Mithai are eaten. Savoury Diwali snacks (often deep fried) are also made and their ingredients include chickpeas, rice, lentils and others. Other foods include puris, Dahl’s, pakoras and vegetable curries. Special foods are also eaten:</td>
</tr>
<tr>
<td>Gujiyas - pastries filled with shredded coconut, dates and sultanas</td>
</tr>
<tr>
<td>Colourful sweets made from milk, sugar and condensed milk</td>
</tr>
<tr>
<td>Kachoris - Round puff pastry filled with spices and lentils</td>
</tr>
<tr>
<td>Savoury rice coloured with saffron, sweetened and garnished with nuts, sultanas and cardamom.</td>
</tr>
</tbody>
</table>
Food choices related to religion and culture

Islam

**Principles and beliefs in relation to food**

- Muslim dietary laws are found in the Qur’an (the Islamic holy book)
- The laws state what is lawful (halal) and require that poultry birds and meat animals have to be slaughtered in a special ritual called Zibah.

**Foods that CANNOT be eaten**

Pork, pork products that contain gelatine
Alcohol

**Special occasion linked to food**

- **Ramadan** - Held in the 9th month of the Islamic calendar (lunar calendar). Each day during Ramadan, Muslims must fast (not eat or drink anything) from dawn to dusk. One meal is eaten before sunrise and another after sunset.
- **Eid-ul-Fitr** - A big celebration held at the end of Ramadan. A wide variety of foods are in in many different countries
- **Sheer Khurma** - A breakfast dish made from Vermicelli (a type of pasta), whole milk, sugar and dates, with other ingredients added such as cardamom, pistachios, almonds, saffron, raisins and rose water.
- **Baklava** - A rich pastry made from layers of filo pastry filled with chopped nuts, honey or syrup.
# Food choices related to religion and culture

## Judaism

### Principles and beliefs in relation to food

- Jewish food laws are called Kashrut.
- Food that is allowed to be eaten is called Kosher, such as fish that have scales and fins, animals that chew the cud (eat grass) and have cloven (split) hooves such as cows and sheep.
- Saturday is called the Sabbath, when no work may be done, so food (e.g., a stew) is prepared the day before and left to cook slowly so it can be eaten on the Sabbath.

### Foods that CANNOT be eaten

- Pork
- Shellfish

Dairy foods and meat must not be prepared or eaten together.

### Special occasion linked to food

- **Yom Kippur** (The day of atonement) Jews must fast (not eat and drink) for 24 hours.
- **Passover and Rosh Hashanah** - Celebrate the birth of the Jewish nation and the New Year.
  - A Seder plate is prepared and contains specific foods that remind Jews of the Passover story.
  - A roasted bone - symbolises the Pesach offering Jews brought to the Holy temple in Jerusalem.
  - A hard-boiled egg - Symbolises another offering brought to the Holy Temple.
  - Horseradish root - symbolises harsh suffering and bitter times endured when the Jews were slaves.
- **Gefilte fish** - This dish is made from a poached mixture of deboned fish, carp, whitefish and is usually eaten as an appetiser.
## Food choices related to religion and culture

### Rastafarianism

**Principles and beliefs in relation to food**
- Rastafarians follow the dietary rules of I-tal
- Foods must be natural and clean and include plenty of fruit, vegetables and herbal teas.

**Foods that CANNOT be eaten**
- Pork
- Fish no longer than 30cm
- Many do not drink alcohol, milk and coffee.

**Special occasion linked to food**
- **Ethiopian Christmas (7th January)** - This includes a large feast, where the food eaten is often vegetarian or vegan.

### Sikhism

**Principles and beliefs in relation to food**
- Many Sikhs are vegetarians

**Foods that CANNOT be eaten**
- Some do not drink alcohol, milk and coffee.

**Special occasion linked to food**
- **Gurpurbs**: These are festivals associated with the lives of Gurus (spiritual teachers)
  - There are several Gurpurbs throughout the year and food is an important feature in them.
  - **Laddoos** are sweets often eaten at these festivals and are made from Flour, Minced dough and sugar.
## Sensory analysis

### Preference tests

<table>
<thead>
<tr>
<th>Name of test</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paired preference test</td>
<td>In this test, people are given two similar samples of food and have to say which on they prefer.</td>
<td>Diet coke, Sugar free coke</td>
</tr>
<tr>
<td>Hedonic Rating test</td>
<td>People are given their opinion on one or more products.</td>
<td>🙄 😞 😞 😞 😞</td>
</tr>
</tbody>
</table>

### Discriminatory Tests

<table>
<thead>
<tr>
<th>Name of test</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Triangle test</td>
<td>In this test, 2 samples are identical and the other something has changed - find the odd one out</td>
<td>Lemonade (1 expensive 2 x cheap)</td>
</tr>
<tr>
<td>A not A test</td>
<td>Opposite of the above - given one sample then asked to find the same one out of the next 2</td>
<td>As above but 2 x expensive 1 x cheap</td>
</tr>
</tbody>
</table>

### Grading Tests

<table>
<thead>
<tr>
<th>Name of test</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grading test</td>
<td>Range of samples given asked to rank out of a scale 1-5</td>
<td>Biscuits</td>
</tr>
<tr>
<td>Rating test</td>
<td>Range of samples given, asked to rank in order based on characteristic e.g.: crunchiest</td>
<td>Range of crisps</td>
</tr>
<tr>
<td>Profiling test</td>
<td>Rank intensity 1-5 of a set of sensory descriptors e.g.: spiciness</td>
<td>Salsa dips</td>
</tr>
</tbody>
</table>
How to set up a food tasting panel

- Set up a quiet area where people will not be disturbed.
- Always have a glass of lemon water or small piece of apple to clear the palate.
- Use small quantities of food on a plain and identical sized plates/dishes.
- Use coloured lighting.
- Use the same garnishing or decoration.
- Try not to serve too many samples at once.
- Serve at the correct temperature for the product being tested.
- Use clean spoons or forks each time. Do NOT allow people to put dirty spoons into your dish.
- Use codes for the products to prevent the testers being influenced by the name of the product (blind testing)
- Have any charts ready before you begin.
- Make sure the testers know how to complete the charts you are using.
## Food Sources

### Where and how ingredients are grown, gathered, reared and caught?

- Growing
- Rearing
- Gathering
- Catching

### Genetically Modified

**Benefits:**
- Better resistance to pests and diseases
- Faster or stronger growth rates
- Different nutrient profile
- More intense flavour or colour

### Seasonal foods

*The time of the year that plants/food are in season (ready to be eaten)*

### Carbon footprint

*The measure of the amount of CO2 gas that is released into the atmosphere from the activities of people, communities, industry, transport etc.*

### Advantages of buying klocally produced food

- Cheaper
- Better quality
- Promotes local farming
- Support local businesses

### Key words

- **Food provenance** - Where foods and ingredients come from
- **Pesticides** - Chemicals sprayed onto plant crops to prevent insect and mould attack and weed growth, and produce strong plants.
- **Grown ingredients** - Plants grown for food (herbs, fruits, vegetables, cereals)
- **Reared ingredients** - Animals, birds and fish specially bred in captivity and brought up to be ready to eat.
- **Gathered ingredients** - Plant foods gathered from the wild for eating (e.g. herbs, berries)
- **Caught ingredients** - Animals, birds, fish and shellfish hunted and caught from the wild for eating.
- **Intensive farming** - Growing or rearing of large numbers of the same type of plants or animals in one place
- **Organic farming** - Producing food using manure, compost and natural methods of weed, pest and disease control rather than chemicals
- **GM Genetic modification** - A scientific technique that enables a particular characteristic from one plant or animal to be inserted into the genes of another

### Food waste

*The amount of waste which is created by food products*
**Sustainability and the 6R's**

**Reduce**
- Reduce the effects of health by using balanced recipes, low in fat, salt and sugar
- Reduction in the use of processed foods
- Reduce energy in methods of cooking
- Eco Footprint
- Reduce food waste
- Reduce the use of pesticides

**Reuse**
- Products that can be reused for either the same purpose or as a new product
- Reuse leftover ingredients to make other food products
- Buy product with little or no packaging

**Rethink**
- Rethink the average UK high-fat diet
- Examine the impact of food products on health
- Rethink the use of healthy ingredients in creative designs

**Recycle**
- To reuse a product
- The choice of packaging materials
- Recycling of tins, plastic card and paper
- Composting

**Repair**
- The function of nutrients in repairing and maintaining a healthy body.

**Refuse**
- Issues related to sustainable design in packaging
- Refuse high in fat, salt and sugar.
<table>
<thead>
<tr>
<th>Symbols</th>
<th>Eat well guide</th>
<th>At least 5 a day</th>
<th>Lactose free</th>
<th>Irradiation symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A pictorial representation of the types of food we should be eating and the rough guide/amounts per serving.</td>
<td>At least 5 portions of fruit and vegetables to be consumed on a daily basis</td>
<td>Lactose free means the product does not contain lactose. Lactose is the sugar which is found in milk.</td>
<td>Tells the consumer if the product has been irradiated (type of food preservation)</td>
</tr>
<tr>
<td>Symbols</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>---------</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>RSPCA Assured</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If there's an RSPCA Assured label on the packaging of the eggs, fish and meat that you buy, you know the farms - and everyone else involved in the animals' lives - have been assessed and meet RSPCA animal welfare standards.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Uk red tractor symbol</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>This is a farm and food quality assurance scheme. The food industry introduced it to promote clearer food labelling and assure consumers that farms and food companies follow high standards of food safety and hygiene, animal welfare and environmental protection.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Forest stewardship council</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>This system allows consumers to identify, purchase and use wood, paper and other forest products produced from well-managed forests and/or recycled materials.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Marine Stewardship Council</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MSC logo means the Marine stewardship council - an organisation that promotes sustainable fishing practices.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Symbols

- **Recycling**: This is the recycle symbol. This is used to tell members of the public that the packaging is suitable to be recycled which means it can be reprocessed and created into something else.

- **Fairtrade**: Fair trade mark is an independent consumer label which guarantees that disadvantaged producers are getting a better deal. It also guarantees farmers in developing countries are getting a fair price for their products, which covers their costs.

- **Traidcraft**: Traidcraft only use ethically produced materials and ingredients which help both the producers and the manufacturers in developing countries.

- **Soil Association**: Organic production is better for the environment, less intensive farming and foods containing fewer pesticides. Restricts the use of artificial chemical fertilisers and pesticides. The soil will also not contain any genetically engineered ingredients. Only natural fertilisers can be used.
<table>
<thead>
<tr>
<th>Symbols</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Gluten Free symbol" /></td>
<td>This symbol tells consumers that the product contains no gluten. This is the protein in products such as Wheat, Barley and Rye. The disease of this would called <strong>Coeliac Disease</strong>. This is an autoimmune disease triggered by sensitivity to the protein gluten.</td>
</tr>
<tr>
<td><img src="image" alt="Vegetarian symbol" /></td>
<td>Vegetarian logo is used on products to let consumers know that the product is suitable for vegetarians therefore it contains no meat.</td>
</tr>
<tr>
<td><img src="image" alt="CE Mark symbol" /></td>
<td>CE Mark is a stamp which is issued to any industrial equipment. This means that it has been tested and conforms to the European Standard.</td>
</tr>
<tr>
<td><img src="image" alt="Average Quantity symbol" /></td>
<td>This symbol you would find on packaging. This is to tell the consumer the average weight of the product. This may vary from product to product.</td>
</tr>
</tbody>
</table>
Symbols

**Cooking Instructions**
Cooking instructions symbol is found on the packaging of products. This would then be next to instructions of how to cook the product to the correct temperature/desired way to achieve the best results.

**Suitable for microwaving**
Suitable for microwaving. This is found on the packaging of food products and it informs the consumer that the product can be microwaved.

**Suitable for freezing**
Suitable for freezing. This is found on the packaging of food products and it informs the consumer that the product can be frozen.

**Keep Britain tidy**
Keep Britain tidy. This is found on the packaging of food products and it informs the consumer that the packaging should be thrown in a bin after use and to keep the country tidy and free of litter.
Symbols

Carbon Footprint

This is the term used to refer to the measurement of our actions on the environment. This is the symbol which is used to represent this.

Global unity

This logo is used to show that we live in a global society.