

Year 8 Food and Nutrition Knowledge organiser

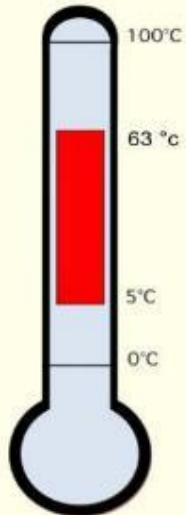
Food hygiene



To prevent bacteria spreading and multiplying

- Wash your hands
- Clean work surfaces
- Keep raw and cooked food separated
- Keep food covered
- Store high risk food in the fridge or freezer
- Cook food until the core temperature reaches 75°C

What happens to bacteria at different temperatures?



75°C Most bacteria is **destroyed** so food is safe to eat at this temperature.

5-63°C Bacteria **grows rapidly** at these temperatures. This is called the **danger zone**.

0-5°C Bacteria **grows slowly**, your fridge should be between these temperatures.

-18°C Most bacteria is **dormant** (asleep), your freezer should be under this temperature.

Using a food probe

1. Clean before use, place into the centre of the food
2. Make sure the probe is not touching the pan or tin
3. Ensure core temperature of food reaches 75°C
4. Leave the probe in place for two minutes
5. Clean the probe after use with an antibacterial wipe



Food poisoning is an illness caused by eating **contaminated food**. In most cases of **food poisoning**, the food is contaminated by **bacteria (microorganisms)** such as **Salmonella, E.Coli and Listeria**.

High risk foods are most likely to cause food poisoning if stored or cooked incorrectly. These foods have a use by date and are **high in protein**. Correct food storage prevents cross contamination and food Bourne illness.

The four C's



Cleaning

Wash and dry your hands and keep everything clean.



Chilling

Store high risk foods in the fridge (0-5°C).



Contamination

Keep raw and cooked foods separate.



Cooking

Cook food correctly, check it is cooked in the centre.

High Risk Foods



Meat



Poultry



Dairy



Fish



Eggs



Cooked Pasta and Rice



Food science



Coagulation

- When **proteins** are heated they undergo irreversible changes.
- Eggs will change from a liquid to a solid.
- The white **coagulates** (sets) at 60-65 °C, the yolk 65 -70 °C and beaten whole egg 68 °C.
- This is the process that will make your vegetable tart set.
- This also happens in meat for example the change from a raw to a cooked chicken breast.



Enzymic browning

Enzymic browning is a chemical process which occurs in fruits and vegetables when cut, grated or bruised.

The **enzyme** Polyphenol Oxidase (PPO) in the fruit reacts with oxygen to produce a brown pigment.



Shortening

- Flour is coated in fat which stops gluten forming when liquid is added.
- This results in a **softer, crumbly texture** instead of crispy and chewy.
- A good example of shortening is **pastry** which is **soft and crumbly** opposed to bread crust which is crusty and chewy.



Dextrinisation

Definition

The browning of starch that occurs when **dry heat** is applied.

How it happens

On dry heating the starch in food goes through a chemical reaction and produces dextrin resulting in a change in colour of food to golden brown.

Examples

Toasting bread and baking biscuits and cakes.



Gelatinisation



The process of gelatinisation occurs when starch granules are heated in a liquid, causing them to swell and burst, which results in the liquid thickening.

What happens at 60 °C ?

Starch granules begin to swell as they absorb the liquid.

What happens at 80 °C ?

Starch granules begin to burst open releasing starch molecules into the surrounding liquid.

What happens at 100 °C ?

Gelatinisation occurs and the sauce is fully thickened.

What happens when the sauce cools down?

It becomes a solid gel.

Bread making



Rubbing in



Knead



Prove/ferment



Knock back



Shape



Bake

Function of ingredients



Yeast is an **microorganism** capable of reproducing itself.

Moisture, food, warmth and **time** are needed to activate yeast.

Each yeast cell forms a centre around which **carbon dioxide** bubbles form. The gas bubbles make the bread dough **rise** and create the breadcrumb structure.



warm



Sugar

- It can take a while for yeast to wake up and get going if it has to gain its **food source** only from flour so adding sugar to the dough mixture **speeds up** the action of the yeast.



Strong flour

- Wheat flour contains two **proteins** called **glutenin** and **gliadin**.
- When water is added to wheat flour and stirred these two proteins grab each other and connect forming **gluten**.
- Strong flour** produces elastic dough because it has a **high gluten content**.
- Gluten is rather like chewing gum and can hold the carbon dioxide gas produced during **fermentation** to produce a good crumb structure in the finished loaf.



Fat

- In bread making fat provides **flavour** but more importantly **lubricates** the dough.
- This helps to retain the gases released during baking thus ensuring a **well risen** loaf which will have a **soft crumb**.
- It also helps it **stay fresh** for longer.



Salt

- Salt plays two important functions in bread. The first is **flavouring**, a basic loaf is going to taste bland without salt.
- Salt also slows the rising process, or **fermentation**, of a yeast bread dough, this gives the gluten in the dough time to strengthen and develop, resulting in a better crumb and a better crust.

Cooking methods & heat transfer



Steaming

- Food is placed in a container over boiling water and cooked in the steam produced.
- It's quick, gentle and avoids the loss of nutrients as the food is not submerged.

Stir frying

- Food is fried in a very small amount of hot oil while being stirred in a wok.
- The very quick, hot cooking preserves colour, texture and nutrients.

Grilling

- A fast method of cooking using intense radiant heat from above.
- Excess fat drips off and there's no need to add oil or butter in the cooking process

Boiling

- Food is submerged in deep boiling liquid.
- There is no added fat but it washes away water-soluble vitamins and 60 to 70 percent of foods' minerals.

Microwaving

- Food is cooked by agitating the water molecules in food using microwaves.
- This is a very fast cooking method and preserves nutrients

Frying

- Deep-frying involves submerging food in hot oil.
- Shallow frying uses less oil but still allows food to soak up extra fat during cooking.

Heat transfer

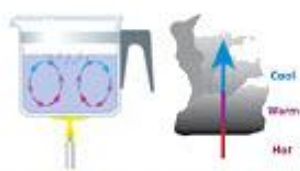
Conduction

Energy is transferred by direct contact



Convection

Energy is transferred by the mass motion of molecules



Radiation

Energy is transferred by electromagnetic radiation



Raising agents



Chemical – baking powder



- The **bicarbonate of soda** in **baking powder** produces **carbon dioxide** when heated.
- The **CO₂ gas bubbles** help to expand the air bubbles in the mixture making it rise.
- Baking powder is added to plain flour to make **self raising flour**.

Physical - steam



- Steam is used as a raising agent in batters e.g. **Yorkshire puddings** and **choux pastry (profiteroles, eclairs)**.
- When water is heated to 100°C it turns from a liquid into a gas and expands rising through the batter and escaping into the oven as **steam**.
- This is a **slower process** than the expansion of gas during a chemical reaction so is only suitable for mixtures with a **high water content**.

Biological - Yeast



- **Yeast** is a single-celled **microorganism** which feeds on sugars and converts that food into **carbon dioxide**.
- Each yeast cell forms a centre around which **carbon dioxide** bubbles form. The gas bubbles make yeasted doughs such as **bread** and **hot cross buns** rise and creates their breadcrumb structure.
- **Moisture, food, warmth** and **time** are needed to activate yeast.

Mechanical - whisking



- **Egg white** is a mixture of **proteins** and **water**.
- Egg white is able to hold up to **seven times its own volume of air** due to the ability of egg white protein to **stretch**.
- When egg whites are whisked the action of the **whisk rotating very fast traps lots of air bubbles**.



Nutrition

Eatwell guide



The **Eatwell Guide** shows the proportions in which **different groups of foods** are needed in order to have a **well-balanced and healthy diet**.

Food groups

Fruits and vegetables give us plenty of fibre, vitamins, minerals, including folate, potassium and vitamins A and C. This group is needed to keep the **gut healthy** and protect us against **diseases (good immune system)**.

Potatoes, bread, rice, pasta and other starchy carbohydrates Provide the body's **main source of energy**.

Beans, pulses, fish, eggs and meat are sources of **protein, vitamins and minerals**. Protein is needed to **build tissues** and cells in the body for **growth and repair**.

Dairy and alternatives are good sources of **protein and vitamins**, and they're also an important source of **calcium**, which helps to keep our **bones strong**.

Oils and spreads are a source of essential fatty acids such as omega-3 – "essential" because the body can't make them itself. **Fat** helps the body absorb vitamins A, D and E.

Foods with added sugar and high in saturated fat are **not needed in our diet**, so should be eaten less often and in smaller amounts. Foods with added sugar and high in saturated fat only have **detrimental** effects on the body and health.

Protein

Protein

Protein is a **macro nutrient**

(macro – needed in large quantities in our diet)

Our bodies need protein for the growth and repair of all cells.

<https://www.youtube.com/watch?v=KSKPgaSGSYA>

Animal protein



Meat



Poultry



Fish



Eggs and dairy



Vegetable protein



Beans and Pulses e.g. chickpeas, kidney beans and lentils



Mycoprotein e.g. Quorn (high protein fungus)



TVP (soya bean flour)



Tofu (soya bean curd)

Carbohydrates

Carbohydrates

- Carbohydrates are the main source of energy in our body
- **Dietary fibre** is a type of carbohydrate that help the body get rid of waste products by preventing constipation.

Starchy carbohydrates

- Starchy carbohydrates like potatoes, bread, rice, pasta, and cereals should make up just over a third of the food you eat, as shown by the Eatwell Guide.
- Choose **higher-fibre, wholegrain** varieties when you can by purchasing **whole wheat pasta, brown rice**, or simply leaving the **skins on potatoes**.



Sugars

- Sugars are a type of carbohydrate that taste sweet.
- They are quickly broken down and absorbed into the body causing a rapid rise in blood sugar level.
- Too much sugar in your diet can put strain on your pancreas which can lead to type 2 diabetes.
- Too much sugar is also a cause of obesity and tooth decay.



Food security & sustainability

What is food security?

The aim of food security is to make sure all people can buy enough safe, nutritious and affordable high-quality food to keep them fit and healthy.

- The world is facing problems with food security and many people are suffering from hunger.
- This problem will only increase as the world population continues to increase and the effects of climate change and other human activities affect food production.



How does meat production affect the environment?

- Loss of land for other uses
- Greenhouse gas production
- High water consumption
- Destruction of natural habitats



We can significantly reduce our environmental impact and improve food security by reducing the amount of meat we eat.

- A vegan diet* reduces greenhouse gas emissions by half.
- To get the same amount of protein from beef as you would from soy requires 32 times more land.
- If everyone were to swap meat for soy, agricultural deforestation would reduce by an estimated 94%.



*A vegan diet is based on plants (such as vegetables, grains, nuts and fruits) and foods made from plants. Vegans do not eat foods that come from animals, including dairy products and eggs.