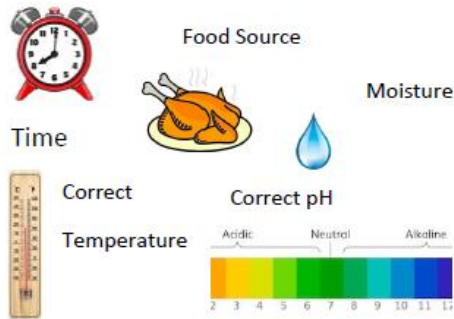


**Types of Micro-organisms**

For each, you will need to explain how they cause spoilage.

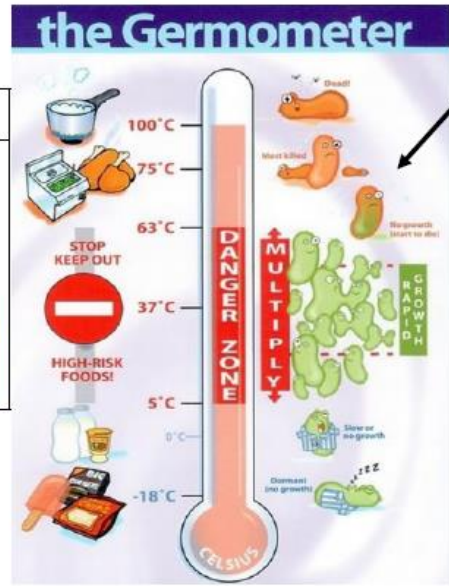
Bacteria	Mould	Fungi

**Conditions needed for growth of micro-organisms**



**Types of food poisoning bacteria**

Learn the names of key food poisoning bacteria, you will also need to know their symptoms and sources. For example, salmonella, E.coli, Campylobacter and Staphylococcus aureus.



**Key Temperatures**

Explain what happens to bacteria at different temperatures. Use the Germometer to help.

For example, when food is frozen at  $-18^{\circ}\text{C}$ , the bacteria becomes dormant. This means that it becomes inactive, however it does not kill it. When the temperature of the food rises, the bacteria will start to multiply.

**The Fridge**

You will need to explain how storing food in the fridge, slows down and can prevent food spoilage.

For example, the fridge temperature is  $1-4^{\circ}\text{C}$ . This prevents bacteria growth as bacteria will start to multiply at  $5^{\circ}\text{C}$ .



**Methods of Preservation** - You must be able to explain the different preservation methods, including the process and how it preserves the food.

Methods include: chilling, freezing, drying, vacuum packaging, MAP, canning, UHT and pasteurisation.



Remember you will need to be able to apply this information to exam questions. For example, discuss how storing food in a fridge reduces food spoilage. (8 marks)

Key words	Definitions
Cross contamination	The transfer of bacteria from one source to another
Danger zone	$5-63^{\circ}\text{C}$ The temperature range that bacteria will multiply
Optimum temperature	The temperature at which bacteria will multiply the most.
High risk food	A food that is easily contaminated by bacteria
Dormant	When bacteria becomes inactive, but it is not killed.
Pathogenic	Food poisoning bacteria

For each key word– learn specific examples and how they contribute to food spoilage or preservation.

**Food Safety Regulations -**

What are the key feature of the Food Safety Act 2013 and the Food Hygiene Regulations 2013?

Key ingredients	Functions
Strong bread flour 	This provides the structure for the dough. It has a high gluten content, this makes the dough elastic. The gluten is developed during kneading.
Yeast 	This can be dried or fresh. This produces carbon dioxide, which is trapped in the dough and helps it to rise. This is the fermentation process.
Salt	This adds flavour to the dough, it also helps to improve the dough.
Water	The water must be tepid or warm. It activates the dough and binds the ingredients together. Sometimes warm milk is used.

### How the key bread ingredients work together.

The flour (starch and sugar) provide food for the yeast. The water provides moisture and warmth within the dough. The yeast is distributed throughout the mixture during mixing as bread dough is kneaded natural proteins in the flour line up and strands of gluten form to create a matrix within the bread dough.

The gluten becomes elastic when developed by kneading and can be pushed up by the carbon dioxide produced by the yeast during fermentation.

Carbon dioxide expands when heated and releases alcohol which provides the aroma produced when bread is cooked. The gluten entangles the bubbles of carbon dioxide and when heated sets giving bread its open texture

Heat causes the sugar to caramelise which gives the crust a good colour (dextrinisation)



**WHAT IS PROOFING?**

- ✓ Proofing is the rise process a dough must make before baking
- ✓ This happens before and after the dough has been shaped
- ✓ Other names for proofing include: blooming, proving, bulk fermentation, first and second rise, final proof and/or shaped proof

The Science : What happens when bread cooks



- The dough rises quickly as the carbon dioxide expands in the heat.
- At 55c the yeast is killed and fermentation stops.
- The water is absorbed in the starch granules. They swell and gelatinize, this supports the structure of the bread.
- The gluten coagulates at 70c and provides the structure for the bread.
- Dextrin forms on the outside of the bread. This gives the bread the crust.



Some thinking questions.

- What would happen to the dough if the water was too cold or too hot?
- What is the purpose of kneading the dough?
- What does the word prove mean?

## Methods of making (Processes)

Ingredient	Function
<b>Self-raising flour</b> Contains a raising agent Has a low gluten content	forms the structure of the cake, Dextrinization of starch gives colour,
<b>Sugar</b> Castor sugar gives a finer texture.	Sweetens Add Texture Add colour as the sugar caramelises on heating Softens the structure Traps air when creamed with butter
<b>Margarine</b>	Adds colour and flavour
<b>Eggs</b>  	Trap air to help the mixture rise. Acts as emulsifier in creaming and all in one cakes. Add colour. Helps form structure as they coagulate on heating Provide moisture which converts to steam on

Cake	Proportion of ingredients	Ratio	Raising Agent	Method	Outcome
<b>Rubbed in Cake</b> -Rock buns -Raspberry buns -Scones	200g SR Flour 100g marg 100g caster sugar 2 eggs 30ml milk	1:2 in cakes 1:4 in scones, contains baking powder	<b>Chemical</b> Baking Powder or Self Raising flour <b>Mechanical</b> Sieving Rubbing In	Fat is <b>rubbed</b> into the flour using fingertips Additional ingredients are added Liquid added to <b>bind</b> together dry ingredients Fat is <b>melted</b> with the sugars and syrups Dry ingredients added Liquids <b>bind</b> all ingredients together	Well risen product Rougher surface Dry, open crumb texture Short shelf life
<b>Melted Cake</b> -Flapjack -Gingerbread -Brownies	Mixtures vary in ingredients Usually a high sugar content	Varies depending on product.	<b>Chemical</b> Bicarbonate of soda	Fat and sugar are creamed together Eggs are slowly added a bit at a time Flour is <b>folded</b> in	Moist and sticky Soft even texture Flavour develops during keeping Long shelf life
<b>Creamed Cake</b> -Victoria Sponge -Small buns -Madeira Cake	100g SR Flour 100g caster sugar 100g soft marg 2 eggs	Equal quantities 1:1	<b>Chemical</b> Baking Powder or Self Raising flour <b>Mechanical</b> Creaming Sieving	Eggs and sugar are <b>whisked</b> until mixture has doubled in volume Flour is <b>folded</b> in	Light brown sponge with fine even texture Longer shelf life
<b>Whisked Sponge</b> -Swiss Roll -Gateaux -Flan case	50g caster sugar 50g plain flour 2 eggs	No added fat	Steam <b>Mechanical</b> Whisking Sieving	Eggs and sugar are <b>whisked</b> until mixture has doubled in volume Flour is <b>folded</b> in	Very light sponge with even, soft moist texture Short shelf life

Method	The science behind it
Beating the sugar and fat together	This is called creaming. Caster sugar has small crystals, so more air is added. The air bubbles are encased by a film of fat
Add the beaten eggs	The eggs add more air. The proteins set when heated and form a layer around the air.
Sieve and stir in the flour	The fat coats the flour and stops too much gluten forming
Bake the cake	Steam, air and carbon dioxide gas push up the stretchy gluten in the flour and protein. The egg proteins coagulate, the starch granules absorb the water and swell. The cake sets to form the structure. The cake goes golden brown due to dextrinization.

## The importance of milk in the diet

It can be eaten raw or used in many dishes

It is the single most complete food known naturally.



It contains the sufficient nutrients in correct proportions

The nutrients are in a form that is easily digestible.

The milk proteins are high biological value

It contains all the essential nutrients with the exception of Vitamin C, that is destroyed by processing

Activate Win  
Go to PC setting

Method	Outline of process– <b>Milk is processed to kill any harmful bacteria</b>
Pasteurisation	Milk is heated to 72c for at least 15 seconds then cooled rapidly. It must be stored in the fridge.
Sterilisation	Milk is heated in bottles to 113c for 15-40 minutes . It can be stored in the cupboard until it opened and then stored in the fridge.
UHT/ Ultra Heat Treatment.	The milk is heated to 132c for not more than 1 second, then it is rapidly cooled. This is also known as long life milk. It can be stored in the cupboard until it is opened and then stored in the fridge.
Homogenised	The milk is sprayed into a chamber at high pressure, this break down the fat particles, so that the fat is evenly distributed throughout the milk. <a href="https://www.bbc.co.uk/programmes/p011t4p1">https://www.bbc.co.uk/programmes/p011t4p1</a>

Thinking question– What is the difference between whole, semi skimmed and skimmed milk ?

### Nutritional Value of Milk

Table 1 Average composition of cow's milk

Component	Percentage
Water	87
Protein	3.5
Fat	3.4-4.0
Lactose	4.9
Minerals	0.7

Table 2: Mineral and vitamin concentrations in milk (mg/100 ml)

MINERALS	mg/100 ml	VITAMINS	µg/100 ml <sup>1</sup>
Potassium	138	Vit. A	30.0
Calcium	125	Vit. D	0.06
Chloride	103	Vit. E	88.0
Phosphorus	96	Vit. K	17.0
Sodium	58	Vit. B1	37.0
Sulfur	30	Vit. B2	180.0
Magnesium	12	Vit. B6	46.0
Trace minerals <sup>2</sup>	< 0.1	Vit. B12	0.42
		Vit. C	1.7

<sup>1</sup> µg = 0.001 gram

<sup>2</sup> Includes cobalt, copper, iron, manganese, molybdenum, zinc, selenium, iodine and others.

What happens when milk is heated ?

The science behind it .

**YOU MUST LEARN THIS !!!**

- Some of the water evaporates
- The protein ( casein) change its structures as it cools down the proteins dry out and form a skin.
- It breaks down the lactose (milk sugar) in the milk and this turns to glucose. This makes it taste sweeter.



Find out about other types of milk, for example what milk will be suitable for a vegan or some one who is lactose intolerant .

Could you explain, why milk is considered to be a complete food?

Classification of cheese	Find at least <b>two</b> examples of different types of cheese.
Hard pressed cheese	Cheddar, Double Gloucester
Lightly presses cheese	Wensleydale, Caerphilly
Blue veined cheese	Blue Stilton, Blue Wensleydale Dale
Cream cheese	Cream cheese, this can be flavoured
Acid curd cheese	Curs cheese, cottage cheese
Ripened cheese	Brie, Camembert
Unripened cheese	Ricotta , Cottage cheese

#### Nutritional Value of Cheese

- It is a good source of protein and calcium.
- It also contains riboflavin ( Vitamin B) and retinol ( vitamin A)
- Hard cheeses have a low water content and is higher in fat
- Soft cheeses have a higher water content and is lower in fat.
- To reduce fat content of a dish use a mature cheese as it will give it more flavour and you will not need to use as much.

#### How is cheese used in food preparation ?

- Eat on its own.
- As a garnish
- In sauces – to thicken and add flavour.

#### The science behind it: The effect of heat on cheese

##### You must Learn this !

- The fat melts first and separates.
- The protein (caseinogen) continues to coagulate.
- Overheating causes the protein to toughen and become stringy. This makes it less digestible.
- Eventually the cheese will burn.

#### How cheese is made :

Pasteurized milk is used , a special bacteria culture is added to convert lactose to lactic acid. The lactic acid helps to preserve the cheese. It is heated to 30c . Rennet is added ( this is an enzyme) and it makes the milk clot ( set) As the cheese set, a solid curd and a liquid whey is formed. The curd is cut and the whey is drained off. Additional ingredients are added and the curd is then pressed for 24 hours . The cheese is then left to ripen.

#### **Types of Yoghurts** <https://www.bbc.co.uk/programmes/p011lc0f>

Yoghurt can be made from different types of milks .

Link for how it is made

Types of yoghurts include:

**Set yoghurt:** it is set in a pot and has a much firmer texture.

**Live yoghurt :** the yoghurt has been fermented with a live culture bacteria.

**Greek ( strained ) yoghurt:** this is made from cows or ewes milk, it is quite thick and is higher in fat.

### What is cream ?

- Cream has all the of main components of milk but it has a higher fat content.
- Milk is left to stand for 24 hours and during this time the cream layer forms. It is then skimmed off and it is heat treated.
- It can be pasteurised, UHT, sterilised or cultured.

### Types of cream

- Clotted cream-55%
- Double cream -48% ( this will thicken when whipped)
- Whipping cream – 35%( this will thicken when whipped)
- Single cream- 18% ( this will not thicken)

### Use of cream in cooking

- To decorate
- To add to a sauce
- As an accompaniment.
- When whipped it has a firm structure and can be used for layers or holding other ingredients.
- It should be gently whipped.
- If it is over whipped, it will separate into large fat globules and liquid whey.



### How does cream thicken ?

- The fat content in the cream determines whether the cream will thicken or not.
- Cream with a fat content of over 35% will thicken.

### The structure of eggs.

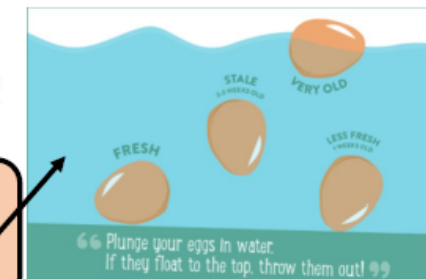
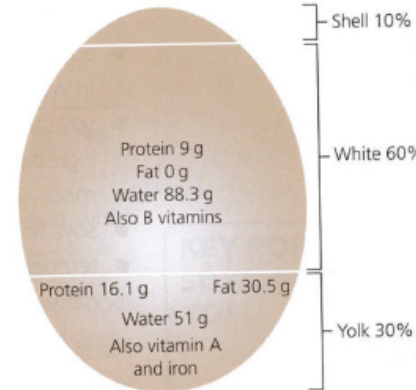
- An egg has a porous shell, this means that it has tiny holes that allows moisture and gases to pass through, it is 10% of the total egg.
- The egg white is 60% of the egg. It includes an inner and outer white the outer white is thinner than the thicker white.
- The yolk this amounts to 30% of the total egg.



### Where do eggs come from?



### The Nutritional Value of Eggs- Can you remember what each nutrient is needed for ?



Testing for freshness– Why does a fresh egg stay at the bottom and an older egg float ?

**The Uses of Eggs In Cooking**


Denature: This is when proteins are heated the bonds between the amino acids unravel and create a different structure.


This will happen when the protein is whisked, heated or put in vinegar.

Coagulate: this is when the proteins become thick and set.

**EGG FACTFILE**

Coagulation	Egg white proteins coagulate (set) at 60°C, yolk proteins at 70°C for thickening e.g. custard, lemon curd
Aeration	Air is trapped in a honeycomb, helping products to rise. E.g. swiss rolls, meringues and mousses
Emulsification	Egg yolks emulsify—preventing oil and water from separating. E.g. mayonnaise
Binding	Ingredients (especially dry ingredients) are held together. E.g. mincemeat in beef burgers
Coating	Prevents food from falling apart or absorbing too much fat. Product is dipped in beaten egg and then flour or breadcrumbs. E.g. fish fingers
Glazing	Gives an attractive golden finish e.g. on pastry products
Enriching	Add to mashed potato to improve it's nutritional value

**The power to change shape** 



Egg white = 60°C  
Egg yolk = 70°C

KEY WORDS: Amino acids Coagulate

**The power to force liquids together** 




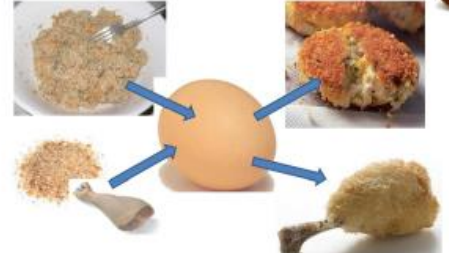
KEY WORDS: Emulsion Lecithin

**The power to expand** 




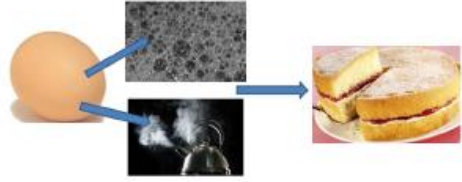
KEY WORD: Aeration

**The power to stick things together** 



KEY WORDS: Bind Coat/enrobe

**The power to make things rise** 



KEY WORDS: Aeration

**The power to colour and shine** 



KEY WORDS: Glaze Colour

Classification of meat - to include examples of :

- \* Animals: pigs, cattle and sheep.
- \* Poultry: chicken turkey, duck.
- \* Game: rabbit, venison, pheasant.
- \* Offal: liver, kidney, heart.

Nutritional value of meat and Poultry

Outline the nutrients found in meat and poultry and what they are needed for.

To include: **Protein, fat, iron, calcium, Vitamins B6 and B12.**

*Top tip: remember that red meat and poultry vary in nutritional value. Red meat is higher in saturated fat and iron but poultry is much lower in fat and contains little iron.*

The structure of meat and Poultry

To include: muscle, connective tissue and fat.

You will need to know how the length of muscle fibres can influence the tenderness of meat.

Cooking of meat:

What are the main changes that take place when meat is cooked?

**Key words:**

Oxygen  
Myoglobin  
Denature  
Coagulate  
Maillard reaction  
Enzymes  
Collagen  
Elastin  
Gelatine

Marinating and Tenderising :

What is a marinade?

How does a marinade tenderise meat?

What other methods can be used to tenderise meat?

What else do you need to know?

What are the reasons why meat is cooked?

Methods of cooking different cuts of meat.

Safe storage of meat and cross contamination.



## Fish



**Classifications** of fish, to include examples:

- White fish, flat fish, oily fish and shell fish.



The **nutrients** that are found in fish and why they are needed by the body.

- Example: fish is a good source of HBV protein, this is good for growth and repair.

*Consider the minerals, such as iron and iodine, Vitamins A and D as well as the Omega 3 fatty acids.*

## Cooking of fish

Describe the methods of cooking fish, including fried, grilled, baked and steamed .



### The Science - What happens when fish is cooked?

Fish cooks quickly because the muscle fibre is short and the connective tissue thin

The connective tissue is made up of collagen and change to gelatine and coagulate at 75 degrees Celsius.

### Filleting a round and flat fish.

You will need to be able to explain the process for each type of fish.

Go onto BBC Good Food to watch the video

<https://www.bbcgoodfood.com/videos/techniques/how-fillet-flat-fish>

<https://www.bbcgoodfood.com/videos/techniques/how-fillet-round-fish>

## Preserving fish, to

include smoking, canning , salting and freezing.



Explain the process and how it preserves the fish.



## The structure of fish

Fish has less connective tissue than meat and no elastin. Muscle fibres are short, this makes the fish flaky. It is also easier to digest than meat



## Focus on Shortcrust Pastry.

The functions of ingredients in short crust pastry.

**The ratio of fat to flour is 1:2 , 1 part fat and 2 parts flour,. For example, 50g fat and 100g plain flour.**



**Plain flour**– Bulking agent, provides gluten to make the network to hold the pastry together. It improves the colour, through dextrinisation ( dry heat on starch)

**Butter**–It gives the pastry the **shortening** properties. The fat coats the flour, it stops long strands of gluten developing as the fat stops the water accessing the flour. It is therefore not stretchy and elastic. It provides a layered texture. Its also adds colour and flavour.

**Water**– It binds the ingredients together and enhances the development of the gluten.

### Thinking questions

- What does the term baking blind mean ?
- What is the most suitable fat for making pastry?
- What can be made using shortcrust pastry?
- What would happen to the pastry if the ratio of fat to flour ?

## What happens when pastry cooks?

The fat melts which produces steam that causes the pastry to rise.

Layers are formed due to the shortening process.



When heated the gluten sets that forms the structure of the pastry.

When it is cooked the pastry turns golden. This is called **dextrinisation**. The starch is converted to sugar which is caramelised, giving the pastry the colour.

### It is important to keep the pastry cool:

- To stop the butter from melting as it could become too sticky and difficult to handle .
- To stop the pastry from shrinking– putting the pastry in the fridge allows the gluten to settle.
- To stop the water being absorbed by the flour– the water is more easily absorbed in warm temperatures.
- Keeping it warm will enhance the gluten formation, making the pastry tough and elastic.
- Cold butter creates air pockets, this will give the pastry a tender structure.

## Choux Pastry: Ingredients and their Functions.



### **60g strong plain flour**

It has a high gluten content that helps the structure of the pastry and gives crispier

texture. Dextrinization takes place ( dry heat on starch) this gives it the golden brown

texture.

### **150g cold water**

This is needed to create the steam, when it is cooked, so that the choux pastry rises.

### **50g butter**

It will add flavour to the pastry and make the dough flexible.

### **2 eggs**

The eggs will act as an emulsifier to make the fat and the water combine together.

When the eggs are whisked they denature and trap air, which will make the pastry rise together.

When heated the protein in the eggs coagulate, which means that they set, this helps to give the structure of the pastry.

***If you do not weigh/measure the ingredients very accurately the mixture will become too runny and it will not work.***

Why do you need to whisk the egg in thoroughly ?

- Adds/traps air to help the mixture to rise.
- Combines eggs well into the mixture, so that they do not separate.
- Combines the ingredients evenly, so that you get a smooth/glossy finish.
- Gets rid of any lumps so that it can be piped easily.
- Develops the gluten, so that the gluten can stretch during baking and gives good structure to the final product.

## The science behind the process– what happens when choux pastry is cooked ?

- The fat melts. The fat and water do not mix together.
- When the flour is added to the mixture. Gelatinisation occurs. The starch granules absorb the water and when heated they start to swell and eventually the starch granules will swell causing the mixture to thicken.
- The eggs are whisked in causing aeration.
- When they are cooked, steam makes them rise. The gluten in the flour sets, giving the structure of the pastry. The eggs coagulate and then turn to a solid, causing the pastry to set.

How do we know choux pastry is cooked ?

- Golden colour, hollow centre and not soggy, crisp texture, light and airy, and well risen

Starch can be found on plants, like wheat, rice, potato and maize. Starches are used to thicken sauces, such as cheese sauce or a gravy.

The main properties of a starch in a sauce are:

- Clarity- how clear it is
- Viscosity- how thick it is.
- Taste- whether it has a bland taste.

There are different types of starches that can be used to thicken a sauce.

These can include :

Type of starch	What does it look like when cooked in water.
Wheat flour	Makes a thick gluey paste
Cornflour	Makes a firm, opaque gel. When it is cooked the water can leak out.
Potato starch	Absorbs more water than other starches. Mixture thickens at a lower temperature and therefore more quickly
Arrowroot starch	Forms a very clear paste, it used to glaze pies and puddings.

### Gelatinisation

Starch particles do not dissolve in liquid, instead they form something called a suspension.

If liquid is not stirred the starch granules sink to the bottom, stick together and start to form lumps.

### Gelatinisation

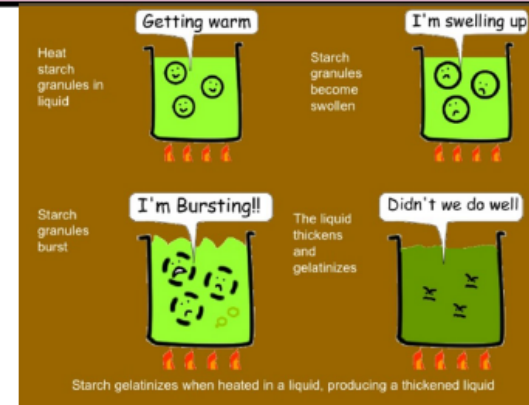
When heated at 60°C, the starch granules begin to absorb the liquid and swell

At 80°C the particles will have absorbed about five times their volume of water until they burst open and release starch, thickening the liquid.

**This process is Gelatinisation**

### Gelatinisation

Gelatinisation is complete when the liquid reaches boiling point 100°C  
When the sauce cools it goes even thicker, going into a Gel.



### Pasta

- Pasta is made from a flour that is called durum wheat, this contains a lot of starch and a good source of gluten that makes the pasta stretchy and strong.
- It is also made from eggs.
- When the pasta is kneaded, this helps to develop the gluten in the flour.
- The gluten forms the structure in the pasta when it is cooked.
- When cooked, pasta needs to be 'al dente' which means of the 'tooth' or chewy.

What happens when pasta is cooked.

The starch in pasta swells when it is cooking , as it is absorbing the water.

The pasta will start to soften .



The starch granules will gelatinise, this is when the starch granules, swell as the they are heated. Eventually they will thicken and burst.

The proteins in the pasta ( gluten from flour) will coagulate and set.

If you over cook pasta it will go very soggy and soft.

**Key Words :**

**Denature:** This is when the structure of the amino acids are altered. They change shape and unfold as the chemical bonds are broken. These can be changed by heat, a change in pH or through a mechanical action.

**Coagulate :** This is a form of denaturation. It causes a change in the texture of food and makes the food set.

**Gluten formation:** Gluten is the protein found in wheat flour. Gluten formation happens when water is added to wheat flour.

**Enzymic Browning:** This happens when enzymes in foods react with air (Oxygen) for example in fruit and vegetables.

**Oxidation :** This is a reaction with oxygen, this causes discoloration of foods and also the loss of vitamins in foods. Oxidation enables enzyme activity.

Types of protein denaturation	Examples
Heat	Cooking denatures proteins as the amino acids unfold.
pH	Using an acid denatures the proteins. Using an acidic marinade that includes lemon juice or vinegar, will denature the proteins in meat and make the meat more
Enzymes	Meat tenderisers cause protein denaturation. Enzymic tenderisers include papain and bromelain.
Mechanical actions	Whisking an egg white denatures the protein. This is called foam formation.

**Enzymic browning**

This happens when the surface of fruit and vegetables are cut and exposed to air. This is because the enzymes have reacted with the oxygen.

**To prevent this:**

Blanch them in boiling water.

Dip them in an acid such as lemon juice.

Remove the air ( Put them in water

Cook them

**Oxidation**

This enables enzyme activity and can cause discoloration.

**To prevent this:**

Cook vegetables in a small amount of water.

Use cooking water for gravy

Steam and do not boil vegetables

**Gluten formation**



**Bread making**

Gluten forms the structure of bread.

Gluten makes the bread stretchy and elastic.

The addition of salt and the process of kneading also helps gluten formation

**Pasta making**

The gluten helps the pasta to keep its shape.

The gluten makes the pasta more flexible and easy to shape



**Pastry making**

When making pastry, the process of rubbing the fat into the flour makes short gluten strands.

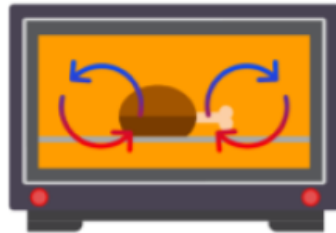
### Why do we cook food ?

- |  |  |
|--|--|
| To destroy harmful bacteria            | To make food easier to chew and digest     |
| To develop the flavour of the food     | To kill any natural toxins or poisons      |
| To make the food look and smell better | To enable food to set, thicken or dissolve |

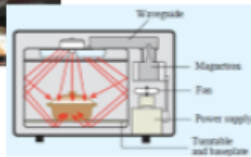
### CONDUCTION



Conduction– this is the transfer of energy . This happens when heat is directly touching a piece of equipment . It heats up the equipment, the heat energy is transferred into the food or a liquid that is heated up and then cooks the food,



Convection– this happens in liquids or gass.  
 In the oven, hot air rises and cooler air falls. The heat waves are transferred form the outside in  
 In a pan, a convection current is caused by hot air rising, allowing cooler liquid to drop down



Radiation– this occurs through space and open air. Radiation transfers energy through space using electro-magnetic waves . These are infrared , when you put food under a grill or microwaves . Microwaves are absorbed by the foods, making the molecules vibrate and heat the food , this makes the food cook. It cooks from the inside to the out.  
 Metals must not be used a it reflects the microwaves.

### Methods of cooking

These can be **dry methods, Water-based or fat based methods**

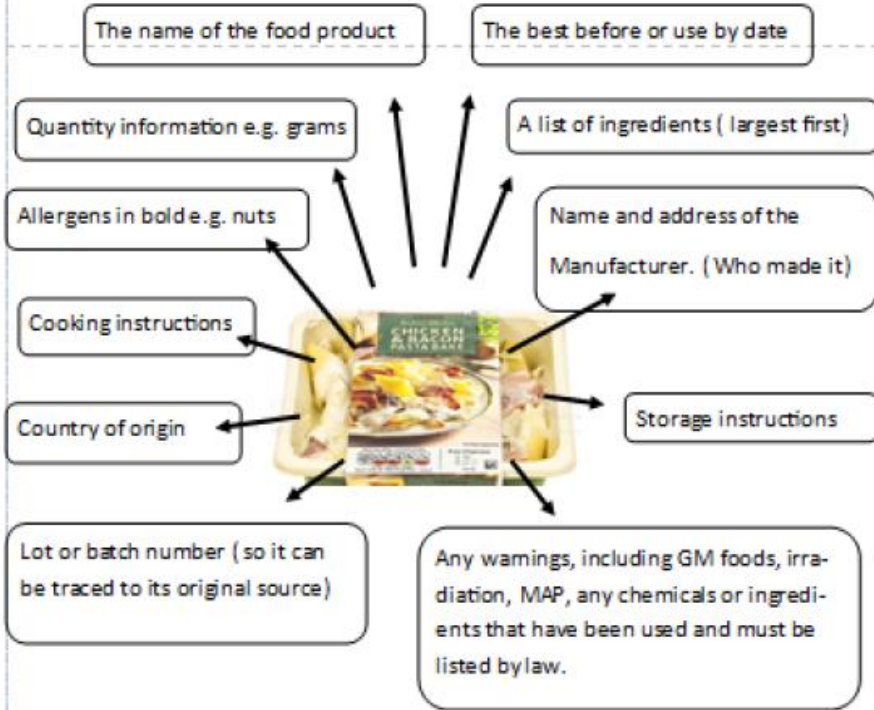
### You will need to know:

- \* The process
- \* Advantages and disadvantages
- \* Examples of foods

Boiling		Baking	
Steaming		Grilling	
Blanching		Roasting	
Poaching		Barbequing	
Simmering		Dry Frying	
Braising		Stir-frying	
Stewing		Shallow frying	

### Food Labelling

By law there are certain pieces of information that must be on a food label. You will need to be able to explain how this information will help the consumer.



Other information that maybe on a label.

- Nutritional information
- Reference Nutritional Intakes (RNIs)
- Traffic light labelling



### Food Packaging

You will need to know some of the advantages, disadvantages and uses of the following packaging materials.

Metals      Plastic      Paper      Card

### How can packaging help the consumer.

Packaging has many uses, below it an overview of how packaging can help to protect the consumer. For each point, you will need to be able to explain them, giving examples.

*For example: it will help to protect the food from damage, such as sometimes apples and peaches are put in a tray, this stops them from bruising and will last longer.*

**To protect the food from damage.**

This could be physical such as bruising

**Safety and hygiene**

To prevent contamination from chemicals and insects.  
To stop cross contamination from other foods

**To give information**

This includes labelling information

**To increase the storage life**

It helps to keep the food in condition that the consumer would expect

**Packaging**

Why do we package food?

**To help to reduce waste**

This could be reseal able packaging, keeping the food cool to stop over ripening.

**For the storage, transportation and selling of the food.**

It keeps the food in prime condition  
Also helps the retailers to stack food in the warehouses.

**To contain the food**

To keep it in the appropriate condition for consumption

*Link to different types of food packaging, linking to Advantages and disadvantages. Also name food products.*

## Primary Processing

When raw foods are changed or converted into foods that can be eaten immediately or into ingredients that can be used to produce other food products.

- washing salad vegetables e.g. spring onions/radishes
- squeezing fruit e.g. fruit juice
- chopping, slicing or cutting e.g. meats or poultry- chicken breasts
- sorting, shelling, peeling vegetables e.g. carrots, potatoes, peas
- heat treatments e.g. pasteurisation of milk
- milling, rolling, sieving e.g. cereals – wheat
- refining e.g. sugar beet/cane
- extraction and refining e.g. vegetable oils

These flours are classified according to the amount of gluten that they have in them as well as the extraction rate of the flour. The extraction rate is how much of the wholegrain of the wheat it has in the flour.

For example : Wholemeal flour has more wholegrain in than plain white flour.

Secondary processing

Converting primary processed foods into other food products.

Examples





Using flour to make bread, cakes, biscuits, sauces, pancakes.

Using milk to make cream, cheese and yoghurt

Using fruit to make jam or jellies

## Primary and Secondary processing

- Flour is made from wheat. The wheat ground down to make the flour. This is an example of primary processing.

Plain flour	Strong bread flour	Self raising flour	Cornflour
Weak gluten content	High gluten content	Weak gluten content	No gluten
No raising agent	No raising agent	Baking powder- this gives off CO2 and makes the product rise.	No raising agent.
Pastries and biscuits	Bread and choux pastry	Cakes	Thickening agent
			

## What are technological developments?

**Man-made smart materials** are raw ingredients that have one or more properties that can be significantly changed in a controlled fashion by external stimuli, such as agitation, temperature, moisture or pH.

e.g.

- Modified starch
- Pre-gelatinized



## Biotechnology/Genetic Modification

**Biotechnology:** This technology is based on science, biology, medicine, agriculture and food to genetically engineer biological systems or living organisms to make or modify products or processes for specific uses.

<https://www.youtube.com/watch?v=2G-yUuiqIZ0> (GM video)

**Genetic modification:** This is a branch of biotechnology, the potential to create change in the quality, variety and quantity of food available world wide.

**Genetically modified (GM) foods** are modified or engineered to alter specific characteristics.

- **Functional foods:** have specific health promoting or disease preventing properties/ lowering cholesterol beyond the basic function of supplying nutrients.

*These foods are also known as nutraceuticals.*

- Plant sterols & stanols
- Prebiotic
- Probiotic
- Nutritional modelling using CAD to create food products (ie low in fat/cholesterol)

<https://www.youtube.com/watch?v=TJlvfwTW90>  
(probiotics video)



## Nanotechnology

<https://www.youtube.com/watch?v=cDUV3hUQ2C8>  
(1<sup>st</sup> 2 mins only)

**Nano technology:**

- **Nano-capsule protection** which can bind flavours or fortifying nutrients, and allow controlled release into a food product. E.g. drinks.
- **Nano- food synthesisers** which can create or alter food molecules.



- **Nano- sensors** that can detect the presence of pathogens, changes in pH or temperature.
- **Nano-bots** are minute robots used to destroy bacteria, making food safe to eat.
- **Nano-emulsions** to create double/triple emulsions to improve the texture of sauces.

### Growing food

What foods are grown in the UK ?

- Cereals such as wheat and barley.
- Vegetables such as potatoes and carrots.
- Fruits such as strawberries and apples
- Sugar beet
- Oilseed rape for cooking oil.

How are crops grown.

- Using arable farming
- The weather conditions determine what we grow.

To grow the crops , the following process is used:

- Preparing the soil, sowing the seeds, watering, pest control, harvesting.

Soft fruits are often grown in polytunnels, to provide protection from the weather.



Intensive farming: use pesticides and fertilizers to grow high-yield crops.

Organic farming: grow foods as naturally as possible. They do not use chemical such as pesticides . They use organic fertilisers.

### Rearing food

What foods are reared in the UK ?

- Pigs, cattle and sheep
- Poultry, including chicken, turkeys, geese and ducks.

How are they reared ?

Factory farms:

- They have a large number of animals
- They have limited space
- They may be fed hormones to make them grow more quickly.
- Milk producing cows live in large sheds.
- Chickens and turkeys are also reared in large sheds.
- The food will be cheaper.

**Organic farms– they put the welfare of the animals are put first.**

- They have access to fields and be free-range.
- Living conditions are much higher.
- They are given a natural diet– no hormones.
- They will be more expensive.

### Caught Food

Fishing methods in the UK are determined by :

- The type of fish being caught
- The area that is being fished.
- Small or large scale fishing.
- What technology the fisherman has.

Types of fishing include:

- Trawling– using a net that is dragged behind the trawler.
- Purse seining– drawing a huge net around a school of fish, such as tuna and herring.
- Dredging– towing metal cages across the bottom of the sea.
- Line fishing—most environmentally friendly.

#### **Farmed fish**

Fish are raised in fish farms, this could be large tanks or huge cages enclosed in rivers or lakes. This includes salmon, trout, cod or sea bass. They are fed wild fish and given hormones to increase growth

There are also organic fish farms that grow the fish naturally, this is more expensive.

### Food miles

This is the **distance that the food has travelled** from its original source to the plate that it has been served on.

It also can include the distance that the customer has travelled to buy the food.

### Carbon footprint

This is the total amount of carbon emission

Produced during the rearing processing and transportation of a product.

Transporting food by air and road, produces polluting gases such as carbon dioxide from the fossil fuels being burnt. These gases contribute to **global warming. This is the heating of the earth's atmosphere.**

### Buying food locally

- This supports the local economy and keep the money in the local area.
- It creates jobs.
- It is often less expensive.
- It reduces the carbon emission and is better for the environment,
- Food can be brought in season.
- The food is fresher and often higher in nutrients.

### Sustainability

This means producing food that is not harmful to the environment. It enables use to keep producing food for future generation's

To do this, we must:

- Avoid food waste
- Reduce the impact on the local environment.
- Think about buying local and season foods.
- Take into account growing and farming methods.

### Local and global markets

**Local markets** are farmers market, refer to buying food locally.

**Global markets** make sure that food is available in the supermarkets all year round.

Food has to be passed through many countries before it ends up in supermarkets. It travels many food miles.

**Community farming** is when local communities come together to grow and produce organic foods . The land is rented by the local farmer. Communities invest and work on the farm together, and they raise money .

### Food poverty

**Food poverty is when an individual or family cannot get enough food for a nutritious diet**

Families experiencing food poverty will often rely on cheaper foods that are often high in fat, salt and sugar.

People may sometimes have to miss meals, if they cannot afford to buy them. Often food banks are used.

Food poverty can happens for many reason:

- Low incomes or benefit changes
- Food prices rising faster than incomes

### Food security

This defined by the World Health Organisation (WHO) as ' all people at all times have sufficient, safe, nutritious food to maintain a healthy active life, in both physical and economic terms' , or more simply countries having enough food to feed the populations.

Key factors that influence food security:

- Disease
- Safety of food sources
- Reduced incomes
- Increases population
- Cost of food production
- Climate and weather changes
- Food waste

### British traditional dishes

Traditional dishes are typical meals associated with the country or it could be a particular area of a country.

Examples of traditional dishes include:

- Steak and kidney pie
- Fish and chips
- Bangers and mash
- Full English breakfast
- Roast beef and Yorkshire pudding
- Cornish pasty

Typical foods: bread, potatoes, vegetables, meat such as beef, pork, lamb and chicken.

### British meal structures

- We generally eat three meals a day: breakfast, lunch and dinner (some call it dinner and tea)



#### Modern British cuisine

British food has changed – more traditional dishes are being reinvented through the style of cooking used.

An example traditionally we would roast our meat in the oven for a long period of time. This would often give the meat a dry texture.

Sous vide is a new method – the food is put into a vacuum sealed bag and then cooked slowly at low temperature. This makes the meat keep its colour and it stays tender.

### Italian cuisine

- Traditional dishes include:
- Pasta recipes
- Lasagne
- Minestrone soup
- Pizza
- Panna cotta
- Antipasta (small bites before a meal)



### Key ingredients

- Olive oil, pasta, tomatoes, garlic, cheeses, seafood, meats such as salami, prosciutto, and pepperoni.
- They also use a range of herbs.

#### Cooking methods

Pan- roasting  
Oven roasting  
Sauteing  
Braising  
Pan – searing

### Chinese cuisine

- Main dishes include: chicken chow mein, sweet and sour dishes, spring rolls, peking dishes dumplings.



### Key ingredients

- Rice, noodles, vegetables such as bean sprouts, bamboo shoots, eggs, fish, tofu, soya sauce, fish sauce, ginger and cinnamon

For breakfast in China, there are different styles in different cities. The most common breakfast food is soya-bean milk, deep-fried dough sticks, porridge, steamed stuffed buns, or rice noodles.

They have a fast lunch, normally rice or noodles

They have a big dinner- that normally include soup, meat and vegetables

### Italian meal structures

- Lunch is considered to be the most important meal of the day.
- A typical lunch will consist of a first course of a rice or pasta dish, a second course that would be meat, meat fish and vegetables. Fruit is then eaten at the end of the meal.
- For celebrations, a typical meal would be 6 courses.



Method of cooking  
Stir frying using a wok  
Steaming  
Blanching  
Deep frying



What are the key features of the Eatwell Guide?

How will it help to improve the health of the nation?

What impact could this have on the NHS?

How can it improve the health of individuals?

**Eight guidelines**

- Base your meals around starchy foods.
- Eat fruit and vegetables
- Get active
- Do not skip breakfast
- Drink plenty of water
- Two portions of fish
- Eat less salt
- Cut down on sugars and saturated fats.

You will need to explain each of the eight guidelines and why it is important to follow them as part of your daily diet.

**Consequences of a poor diet on individual health.**

You need to know what causes each of the diet related illnesses, what impact it has on health and how to reduce/prevent it.

- ◊ Coronary heart Disease ( CHD)
- ◊ Type 2 Diabetes
- ◊ Tooth Decay
- ◊ High Blood Pressure
- ◊ Rickets
- ◊ Obesity

**An example**

**Anaemia**—this is when the body has a deficiency in iron. Iron is needed for the formation of red blood cells, these carry oxygen around the body.

Symptoms of anaemia include tiredness, breathlessness, lack of energy, pale skin and dizziness.

To prevent this eat foods that are a good source of iron, such as green leafy vegetables and red meat.



### Target groups

#### For each of the target groups:

- Pregnancy
- Babies and toddlers
- School children
- Teenagers
- Adults
- Older adults

#### You will need to know

- Nutrients they need in their diet.
- Why they need these nutrients
- Other guidelines that they should follow in order to follow a balanced diet.

### Vegetarians

The reasons why a person may choose to become a vegetarian. For example, moral reasons.

The types of vegetarians.

Types of meat alternatives– soya, TVP, Quorn, tofu.

Nutritional implications– lack of protein, iron, too much fat.

You will need to have an understanding of other specific diets:

Lactose intolerance

Celiac disease

Nut allergy

The causes and consequences of each condition.

Practical ways of adapting recipes

### Food Choice

You need to understand the factors that influence our choice of food. You need to state them and give them an example.

- ◇ **Biological** - hunger, palatability, preferences.
- ◇ **Social**– time of the day, lifestyle, medical.
- ◇ **Economic**– seasonal foods, cost/income, availability
- ◇ **Physical**– access, skills/education, time available.
- ◇ **Social**– family, cultural, ethical
- ◇ **Attitudes**– knowledge about food, peer pressure.

You must know : the **function** ( what it is needed for), the **sources** ( the food where it is found) , the **deficiency** ( what happens if the body does not have enough) and the **excess** ( what happens if the body has too much) of all the **Macro** ( nutrients that are needed in large quantities) and **Micro** ( nutrients that are needed in small quantities) nutrients.

### Micro Nutrients

<u>Vitamins</u>	<u>Minerals</u>	<u>How do the nutrients work together?</u>
<p>A– Retinol and carotene</p> <p>B group to include B1, B2, B3, B12 and folic acid</p> <p>C</p> <p>D</p> <div style="border: 2px solid orange; padding: 5px; margin-top: 10px;"> <p>Classify the vitamins into water and fat soluble.</p> <p>Find out what happens when foods are cooked. For example, Vitamin C is destroyed by heat .</p> </div>	<p>Calcium</p> <p>Magnesium</p> <p>Iron</p> <p>Iodine</p> <p>Sodium</p> <p>Fluoride</p> <p>Potassium</p> <p><u>Water</u></p> <p>What are the functions of water in the diet? For example, it is needed for the chemical reactions in our body.</p> <p>What happens if we have too much or too little water?</p>	<p>Iron and vitamin C-</p> <p>The vitamin C helps with the absorption of iron</p> <p>Calcium and vitamin D-</p> <p>Work together for the development of strong bones and teeth.</p>

You must know : the **function** ( what it is needed for), the **sources** ( the food where it is found) , the **deficiency** ( what happens if the body does not have enough) and the **excess** ( what happens if the body has too much) of all the **Macro** ( nutrients that are needed in large quantities) and **Micro** ( nutrients that are needed in small quantities) nutrients.

### Macro Nutrients

<u><b>Protein</b></u>	<u><b>Fats</b></u>	<u><b>Carbohydrates</b></u>
Structure	Difference between a fat and oil	Classification of carbohydrates, including starch, sugar and NSP.
Amino acids	Functions in the diet	Monosaccharides, disaccharides and polysaccharide
HBV and LBV ( definition and sources)	Saturated fats and their impact on health	Function of carbohydrates
Functions	Essential Fatty Acids	Complex and simple carbohydrates
Deficiency of protein.	Unsaturated fats and their benefit for health	Insoluble and soluble fibre.
Consequences of having too much protein in the diet.	Practical ways of reducing fat in the diet.	The consequences of having too much and too little carbohydrates in the diet.
	The link between fat and poor health e.g Obesity, CHD , Type 2 diabetes.	