

You must be able to know and understand the reasons why food is cooked and how heat is transferred to food. **You must** know the methods used for cooking foods and how to maintain the nutritional value of food through preparation and **you must** know the reasons for selecting different cooking methods.

Key Terms	
Radiation	Transferring heat by infrared waves which pass through the surface of the food.
Conduction	Transferring heat through a solid object into food e.g. a fried egg.
Convection	Transferring heat through air or liquid to cook food e.g. rice.
Coagulation	During cooking, proteins denature and coagulate.
Maillard's reaction	When protein and a carbohydrate are heated with a dry heat, this reaction occurs and flavour compounds are created.
Plasticity	Because fats contain water, they soften upon heating. This property is called plasticity. The chemical make up of fat determines its hardness at room temperature and how quickly it will soften or melt.
Dextrinization	The browning of starch with heat.
Caramelisation	This happens when sugar is heated, the food gradually turns brown and flavour changes e.g. caramel.
Gelatinisation	The change that starches undergo during cooking.

Why do we cook food?
To kill pathogenic bacteria : make food safe to eat
To improve the flavour of food
To make food edible and aid digestion
To make food aesthetically appealing
To preserve food
To change the properties of food e.g. egg coagulates to make a fried egg
To add texture and colour to food e.g. caramelising
To improve the shelf life of food
To give a variety of food in the diet
To have hot food in cold weather

Vitamins and minerals are unstable. **Water-soluble vitamins** (B and C) are dissolved in water and these vitamins can be easily destroyed during food storage and preparation. Nutritional losses are caused by: enzyme activity in the food, oxidation, heat, light, alkalinity and solubility in water or fat.

All foods lose some vitamin content as they are processed and/or cooked. The water-soluble vitamins (B and C) are the most susceptible. It is therefore important to use the correct cooking techniques:

- cook vegetables in the minimum amount of water
- cook vegetables for the minimum amount of time
- consider steaming vegetables or stir frying where water is not used as a heat medium
- use vegetable water to make gravy and sauces.

Methods of cooking

Moist methods of cooking

Boiling, simmering, poaching : fast method of cooking.

Steaming : perfect for maximum nutritional value of vegetables, can steam traditional puddings e.g. Christmas.

Braising/stewing/sous vide : slow method of cooking, good for tough cuts of meat to make them tender.

Dry heat

Roasting, smoking, BBQ in general.

Grilling : bacon.

Dry frying, stir frying in very little fat.

Oil and fats

Deep frying : battered fish, scotch eggs.

Shallow frying : frying in a small amount of fat.

Roasting: in the oven in hot fat e.g. beef joint.

Key points

1. Cooking food makes it safe, allows it to keep for longer and makes it more palatable.
2. Cooking methods can achieve specific characteristics in food.
3. Heat is transferred by conduction, convection and radiation. Cooking commonly uses a combination of heat transfer methods.
4. Heat alters the flavour, texture, appearance and volume of food because of the effect of heat on the water, fat, protein and starch that is found in food.
5. 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 a whole egg 68°C. This also happens in meat, for example, the change from a raw beef patty to a cooked beef burger.
6. **Starch** particles will not dissolve in cold liquids. The liquid must be heated so the particles swell and rupture. At 60°C, liquid is absorbed by the starch. The particles will swell and rupture, heating continues to 80°C and the mixture becomes thick and viscous. The starch has gelatinised (a gel has formed). Upon cooling, it sets and becomes solid.

