

SCIENCE OF COOKING FOOD

Raising Agents

- **Whisking:** whisking eggs to trap air and creating a foam, used for meringues and soufflés
- **Sieving:** Sieving will trap air, used for cakes and bread
- **Rubbing in:** Rubbing fat in to flour with add some air, used for cakes and biscuits
- **Creaming:** Mixing fat and sugar together traps air, used for cakes
- **Laminating:** Layers of fat in pastry will trap air when cooked, used for puff and flaky pastry

WHY DO WE COOK FOOD?

- To kill bacteria
- To make it easier to eat and digestible
- To improve the sensory attributes
- Adds variety
- To enable ingredients to perform their function

Acids & alkalis

- **Acids:** can soften connective tissue such as lemon juice or vinegar in a marinade. Can also be used to preserve foods by pickling.
- **Alkalis:** Bicarbonate of soda is used as a raising agent. Mixed with cream of tartar creates 'Baking powder'

Radiation



The transfer of heat by electromagnetic radiation. Example: Grilling or BBQ

Conduction



The transfer of heat by direct contact. Example: Frying

Convection



The transfer of heat via mass movement of particles. Example: Boiling, Poaching

Effect of heat on foods

- **Protein:** proteins denature (unravel) and coagulate. When protein and carbohydrate are heated the maillard effect occurs which turns meat products brown
- **Fat:** Fat melts and becomes soft, this is called plasticity. Fats can also brown adding flavour and colour.
- **Carbohydrate—starch:** When starch and liquid are heated gelatinisation occurs which makes the starch swell, used to thicken sauces. When direct heat is applied to starch Dextrinization occurs turning the food brown and crisp.
- **Carbohydrate—sugar:** When heat is applied to sugar caramelisation occurs which turns the sugar brown and in some cases will go crisp



Oxygen and Food

- Fruit and vegetables when contact with oxygen is made, this is called enzymic browning
- Meat that comes in to contact with oxygen will turn brown, this is a discolouration of the myoglobin
- Fats and oils that come in to contact with oxygen will go rancid where it develops an unpleasant odour and flavour.



Dry Cooking Methods

Roasting	Cooked in the dry heat of the oven and basted with hot fat
Baking	Cooked in the dry heat of the oven
Grilling	Cooked by the radiant heat of a hot grill

Frying Methods

Stir Fry	Cooked quickly over intense heat in a wok with little oil
Shallow Frying	Cooked in a shallow pan with hot fat
Deep Frying	Cooked submerged in very hot oil

Moist cooking Methods

Boiling	Cooked quickly in boiling water
Poaching	Cooked in gentle simmering water
Stewing	Cooked gentle and slow in liquid

EMULSION: a stable mixture of liquids that will not freely combine that has an agent such as egg yolk added to create an emulsion. Example Mayonnaise

