

### ***The science in baking***

#### **Rising agents:**

Raising agents make bread and cakes rise in the oven so that they have a spongy texture.

Raising agents put a gas (air or CO<sub>2</sub>) in the mixture. Then, in the oven the heat makes the gas expand and pushes up the mixture. The mixture is able to stretch because of the gluten in the flour. After a while the heat in the oven sets the gluten so that the mixture keeps the risen shape. There are several types of rising agents:

#### **Natural raising agent: Air**

- Used alone in sponge cakes and pastry or with another raising agent in other baked goods.
- Air is put into mixtures by
  - (a) Sieving
  - (b) Rubbing fat into flour
  - (c) Creaming sugar and fat
  - (d) Whisking eggs with sugar



#### **Chemical Raising Agents**

- These depend on a chemical reaction to make the gas in the dough.
- An alkali and an acid react to make a gas called carbon dioxide (CO<sub>2</sub>)



#### **Biological Raising Agent**

- Yeast
- Tiny living organisms make CO<sub>2</sub> in the dough
- In the oven the bubbles of CO<sub>2</sub> expand and pushes up the dough, until the gluten sets the dough
- The heat also kills the cells



#### **Proteins:**

Denaturation->the process of altering a protein's molecular characteristics or properties.

Coagulation-> The process of turning a liquid into a solid. Example: eggs

#### **Carbohydrates:**

Gelatinization->When heated a moisture thickens as starch particles absorb water. Example: white sauce.

Caramelization->Sugars change color and flavor when heated. Example: onions.

Dextrinization->Browning that happens when starches are cooked. Example: toast.

#### **Fats:**

Plasticity->The ability of fat to hold its shape or melt.

#### **Water:**

Evaporation->When water is heated, it turns into a gas.

WHAT HAPPENS  
WHEN FOOD IS  
COOKED?

### Function of carbohydrates in sauces

Sauces are thickened by **gelatinisation**



### Sauce Making

Sauces are liquids that are thickened and included in dishes to add moistness, nutritional value, flavor, richness and to improve the appearance of the dish

Sauces can be made using the **blended method** (cornflour is mixed with a liquid and heated) or the **roux method**.

They can be used to as a pouring or coating sauce or to bind other ingredients together

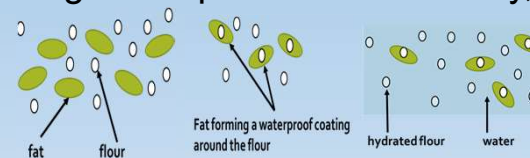


	Proportions of ingredients	Ratio	Outcome
Pouring white sauce	15g plain flour /fat 250g milk	1: 1: 16	Smooth well flavoured sauce, pours freely in thin flow
Coating white sauce	25g plain flour/fat 250ml milk	1: 1: 10	Smooth, well flavoured, thick enough to coat back of a spoon, served with cauliflower, fish, etc
Binding white sauce	50g plain flour/fat 250ml milk	1: 1: 5	Smooth, well flavoured. Very thick to hold other ingredients or bind them together, eg egg white in soufflé, dried ingredients in a meat loaf

Pouring	Coating	Binding / Panada
A <b>pouring</b> sauce, at boiling point, should just glaze the back of a wooden spoon, and should flow freely when poured.	A <b>coating</b> sauce, at boiling point, should coat the back of a wooden spoon, and should be used as soon as it is ready, to ensure even coating over the food.	A <b>binding</b> sauce or <b>panada</b> should be thick enough to bind dry ingredients together, so that they can be handled easily to be formed into croquettes, cakes etc

### Function of fat in pastry

Fats have a '**shortening**' effect in pastry and biscuits. When fat is rubbed into flour it forms a waterproof coating around the flour particles which reduces the amount of water that can be mixed with the flour. When only a little water is absorbed by flour less gluten is produced and so the mixture is shortened. This shortening effect produces a crumbly, melt-in- the-mouth texture (**plasticity**).



Fats can also be used for aeration, flakiness, retention of moisture and glazing.

Fats can be:

- saturated
- unsaturated
  - Monounsaturated
  - Polyunsaturated

Carbohydrates can be divided into three groups:

- monosaccharides
- disaccharides
- polysaccharides.