Your notes

GCSE Food Preparation and Nutrition: revision notes

Functional and chemical properties of food

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Proteins

- **Denaturation**: the structure of a protein unfolds because of heat, acid or mechanical action (such as whisking).
- **Coagulation**: denatured proteins join together and set, such as egg setting when cooked, or a quiche setting.
- Gluten formation: two proteins in wheat flour (glutenin and gliadin) form gluten when mixed with water and kneaded, making dough stretchy so it traps gas.
- Foam formation: whisking egg whites traps air; the stretched proteins hold the air bubbles, as in meringue.

Carbohydrates

- **Gelatinisation**: starch granules absorb liquid and swell when heated, thickening a sauce. It happens as the mixture heats to around boiling, so sauces must be stirred.
- **Dextrinisation**: dry heat breaks starch into dextrins, turning food brown, such as toast.
- **Caramelisation**: sugar melts and turns brown when heated, adding flavour and colour, such as caramel.

Fats

- **Shortening**: fat coats flour particles, stopping long gluten strands forming, so pastry is crumbly and short.
- Aeration: creaming fat and sugar together traps air, helping cakes rise.
- Plasticity: solid fats soften over a range of temperatures, so they can be spread and shaped.

- **Emulsification**: oil and water don't mix, but an emulsifier such as lecithin in egg yolk holds them together, as in mayonnaise.

Raising agents

- Mechanical: air added by sieving, creaming, whisking, rubbing in or folding.
- Chemical: bicarbonate of soda and baking powder give off carbon dioxide when heated with moisture.
- Steam: water in the mixture turns to steam and expands, as in choux pastry and Yorkshire puddings.
- Biological: yeast ferments sugar, producing carbon dioxide. It needs warmth, moisture, food and time.

Key terms

Denaturation	The unfolding of a protein's structure, caused by heat, acid or whisking.
Coagulation	Denatured proteins setting, such as egg setting.
Gelatinisation	Starch grains swelling and thickening a liquid when heated.
Dextrinisation	Starch breaking down into dextrins with dry heat, causing browning.
Caramelisation	Sugar melting and browning when heated.
Shortening	Fat coating flour so gluten strands stay short.
Emulsification	Holding oil and water together using an emulsifier.
Raising agent	Something that adds gas to a mixture to make it rise.

Quick questions

Cover the answers and test yourself: remembering is what makes it stick.

1. What is coagulation?
2. What happens during gelatinisation?
3. What causes toast to turn brown?
4. What is caramelisation?
5. Which ingredient acts as an emulsifier in mayonnaise?
6. What does shortening do in pastry?
7. Which raising agent produces carbon dioxide by fermentation?
8. Which raising agent makes choux pastry rise?

Answers

1. Denatured proteins setting
2. Starch granules swell and thicken a liquid when heated
3. Dextrinisation

Your notes

4. Sugar melting and browning when heated
5. Egg yolk
6. Fat coats flour so gluten strands stay short
7. Yeast
8. Steam

What to do next

Practise 11 questions on this topic

Try 5 exam questions, with mark schemes

Read the lesson, one step at a time

Free revision for GCSE and KS3 at lycolearn.co.uk. Some notes are for one exam board only, and say so in brackets.

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