

Method 4 (carbon dioxide)

Aim

Making a batch of scones, and investigating the most effective raising agent in terms of external and internal appearance, texture, degree of rise and flavour.

Equipment

You will need for each variation:

- Digital scales
- Mixing bowl
- Sieve
- Small knife
- Flour dredger
- Rolling pin
- Scone cutter
- Scone rolling guides (if available)
- Palette knife
- Measuring jug
- Pastry brush
- Baking tray lined with greaseproof paper
- Oven gloves
- Cooling rack
- Ruler
- Digital timer / stopwatch / clock with a second hand
- Serrated knife

Method

- Preheat oven to 230°C (210°C if using a fan oven)
- Control – 115g plain flour, pinch of salt, 5g baking powder, 15g butter, 70ml fresh milk.
- Repeat the above experiment with the following variations:
- **Variation 1** – 115g self-raising flour, pinch of salt, 15g butter, 70ml fresh milk.
- **Variation 2** – 115g plain flour, pinch of salt, 15g butter, 2.5g bicarbonate of soda, 5g cream of tartar, 70ml fresh milk.
- **Variation 3** – 115g plain flour, pinch of salt, 15g butter, 5g bicarbonate of soda, 70ml fresh milk.
- Sift the flour, salt and raising agent/s into the mixing bowl.
- Cut the butter into small pieces, then use your fingertips to rub it into the flour until the mix resembles fine breadcrumbs.
- Add the milk all at once and mix quickly to form a soft dough. Knead gently for a few seconds until the dough becomes smooth, and then roll out onto a lightly floured surface to a 2cm height. Cut into rounds using a scone cutter, making sure that you use the same size cutter for each variation and that each scone is rolled out to the same thickness.

- Glaze the tops, not the sides, with milk. Bake at 230°C (210°C if using a fan oven) for 10 minutes.
- Remove from oven and transfer to a cooling rack. Make sure that the scones are clearly labelled so that they do not become muddled up.
- Use a serrated knife to cut one scone from the Control and each Variation in half, so that you have 2 half-moon shapes.
- Measure the height of each one with a ruler. Examine the texture and appearance (including the colour), and then taste the scones.

Results

Compare your findings in the table below:

Comments	Control	Variation 1	Variation 2	Variation 3
External appearance				
Internal appearance/ texture				
Degree of rise				
Flavour				

Conclusions

Summarise your findings here. You should consider the following:

- Rank samples in order of preferred rise.
- Rank samples in order of preferred appearance.
- Rank samples in order of preferred texture.
- Rank samples in order of preferred flavour.

In your opinion, which is the most successful sample? Explain your answer.

Write a paragraph explaining the action of the raising agents when scones are baked.

Extension task

Write a list of experiments that could be conducted with scones. For each experiment, make sure that you specify the aim of the experiment, and list the variations that you will use.

Find out the difference between Single and Double acting baking powders.

Question:

Why do scone recipes include cream of tartar with bicarbonate of soda? Why not include bicarbonate of soda only, and leave out cream of tartar?

Write down the chemical equation for the reaction of sodium bicarbonate (bicarbonate of soda) as a raising agent.

Write down the chemical equation for the reaction of sodium bicarbonate (bicarbonate of soda) with cream of tartar (potassium hydrogen tartrate) as a raising agent.

What happens to your scones if too much raising agent is added?

What happens to your scones if too little raising agent is added?