

Should beans be cooked with the lid on or off?

Introduction

Heston Blumenthal is one of the top chefs in the country – his restaurant, The Fat Duck, has three Michelin stars. He is noted for his scientific approach to cooking – he regularly asks the question '*why?*' rather than accepting what other chefs say, and he devises and carries out experiments to try to find answers.



Heston Blumenthal in The Fat Duck



What affects the colour and texture of cooked vegetables?

One question posed by Heston Blumenthal early in his career as a 'scientific chef' was '*Why do cooks add salt (sodium chloride) when cooking vegetables, for example green beans?*' Possible reasons suggested by cooks included:

- it keeps the beans green
- it raises the boiling point of water so the beans cook faster
- it prevents the beans going soggy
- it improves the flavour.

Some cooks believe that green vegetables (such as peas or green beans) will discolour, that is turn yellowy-green, if cooked with the lid on.

Practical work

Your task is to devise and carry out an experiment to test whether cooking green vegetables with the lid on or off makes any difference to their colour. You will need to take care to make the experiment a fair test by thinking about which factors you should keep the same and which you should change in each experiment. It is important that the person who is assessing the colour does not know whether the sample he or she is looking at has been cooked with the lid on or the lid off. He or she could compare the colour of cooked vegetables with that of uncooked ones. Another possibility is to show the tester three samples of beans, two cooked with the lid on and one with it off and see if they can pick the odd one out.

Apparatus and equipment

Your group will need:

- saucepan with lid or large beaker with clock glass to act as a lid
- access to a cooker or other means of heating (eg Bunsen burner, tripod, gauze and heatproof mat)
- a tea strainer is useful for draining the vegetables.



Lid on or off – is there a difference?

Chemicals

Your group will need:

- suitable green vegetables – peas (fresh or frozen) are convenient as are green beans which you can cut into approximately 1 cm lengths to make them easier to handle and so that you use fewer beans.



Safety

- Wear eye protection.
- Take care with boiling water.
- Make sure that you follow the hygiene precautions that your teacher explains to you.