



# GOLD AWARD PROJECT IDEAS



typically 70 hours of project work



## What effect do additives have on bread?

**Before you start your investigation, you should carry out a risk assessment and have it checked by your teacher. For help with this, read through our health and safety information and look out for health and safety warnings in the text.**

Most shop-bought breads also contain a selection of different natural and artificial additives designed to make the bread last longer and keep it fresh during its shelf-life. Most bread that is produced for sale must display a full ingredients list on its packaging, including additives. In this project, you will investigate the role of different additives used to preserve and enhance the quality of bread and determine how effective different additives are.

### Getting started

Begin the project by carrying out research into the types of additives used in bread. You could also research additives that were traditionally used in bread-making before the advent of modern E-numbers. This might form part of your experiment where you compare traditional and modern bread-making and the effectiveness of the additives used. You can make contact with various organisations concerned with the bread industry, such as The Federation of Bakers, or companies who produce bread. Some of the different additives used are:

- Preservatives
- Emulsifying agents
- Added vitamins and minerals the bread is fortified with so it will meet the approved nutritional levels.
- Processing aids – aids such as certain enzymes are allowed for use in bread production. They are not listed as an ingredient as they are broken down during the process of bread-making.

Carry out a range of experiments making bread to compare different groups of additives using in bread-making, for example natural versus artificial preservatives.



Remember taste testing should only be carried out in a food technology room, following hygienic procedures and using food quality chemicals.

### How good is your bread?

Compare the different breads you make in a number of ways. This should include:

- The quality of the newly baked bread – you should make a list of what the important qualities of fresh bread are and decide whether your breads have these qualities.
- If the bread keeps its quality when used to make sandwiches.
- How well it keeps – in terms of how quickly it goes stale, how long before mould appears etc. Compare a sliced loaf and a non-sliced loaf of each type of bread.



If you have mouldy bread, you will need to plan its disposal in a way which will not allow spores to disperse.

### **Investigate the enzymes in your yeast selection**

- Determine the amount of CO<sub>2</sub> produced by different types of yeast.
- Determine the effect of temperature on enzyme activity in yeast.
- Determine the effect of pH on enzyme activity in yeast.
- Determine the effect of different substrates on enzyme activity in yeast.

Rank your selection of yeast types from high to low in terms of their suitability for bread making. Justify your decision based on the evidence from your enzyme experiments.

### **Investigate brewing**

Carry out a research exercise into the use of yeasts in the brewing industry. Explain how the factors you have investigated above are controlled. You might like to set up your own fermentation to compare the effectiveness of different yeasts/substrates etc. in the fermentation process.

