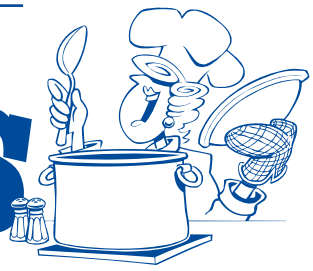
activities



How bread is made in New Zealand

The Rising Experiment

Aim:

To set up an experiment using a control dough and a dough with a manipulated variable.
To measure the fermentation process over time.

Materials:

A Bread Recipe and the ingredients needed (see 'Bread Recipe' Information Sheet)
2 Measuring cylinders (beakers or test tubes)
Stopwatch
Graph paper and pencil to record results

Method:

Prepare the standard bread recipe and call this your CONTROL.
Prepare the same bread recipe as for the control dough but choose one of the variables outlined below to change. Call this your MANIPULATED dough.

Variables to reduce the time needed for fermentation:

A high kneading speed, e.g. 20-25 minutes on high speed in a mixer.
A high temperature in the rising area, e.g. higher than 26°C (79°F).
Insufficient water added to the dough, e.g. the dough is too firm or stiff.
Double the yeast added to the mixture.

Variables to increase the time needed for fermentation:

A slow kneading speed. Instead of using a mixer, knead the dough by hand.
An extremely low dough temperature (below 22°C (77°F)). Use cold water for mixing or let the dough rise in a cold room or refrigerator.
Use too much water.
Use half the yeast stated in the recipe.
(Note: only one change must be made to the manipulated dough.)

Label one measuring cylinder CONTROL and the other MANIPULATED.
Place a small piece of each dough (enough to cover the bottom of your cylinder) in each measuring cylinder.
Record the fermentation process for each dough at zero time (when you first put the dough in the beakers) and then every 30 minutes for three hours. At each time use the marked measurements on your cylinder to measure the volume (centimetre^3) of the fermentation.
Record your information in a table.

TIME (minutes and seconds)	CONTROL VOLUME (cm^3)	MANIPULATED VOLUME (cm^3)	DIFFERENCE IN FERMENTATION
0.00			
0.30			
1.00			
1.30			
2.00			
2.30			
3.00			

Results:

Record your results on a line graph. On the Y-axis record how much the dough has risen and on the X-axis record the time. Plot each doughs' measurements on the same graph. Include a key for each line. Compare your results. Are there any differences in the fermentation over the three hours? Is there a period of time where fermentation is faster or slower for one dough but not for the other?

Buy different types of bread that are available in the shops and describe the differences between them. Prepare plates with a slice of bread from each different loaf. Label each plate with the type of bread. Challenge a friend who has not seen your preparations to name each type of bread with a blindfold on. On a table in front of your blindfolded friend place one plate at a time. Your friend can taste, smell and feel the bread to guess what it is. Write down his/her answer. Give your friend a drink of water in between tastings so that he/she does not get confused with his/her answers. When finished naming all the breads, take the blindfold off and share the answers.

If this activity is too difficult, read a list of answers your friend could choose from for each type of bread. To challenge your friend, have 2 plates set up with the same type of bread (but don't tell your friend!)

Try under mixing (short mixing time) and over mixing (long mixing time) dough and compare the loaves when baked.

Visit your local bakery. Watch and record all the steps involved in bread production. Design a flow diagram or chart which shows all the different processes involved in making bread and the jobs people do. Explain your diagram/chart to someone else.