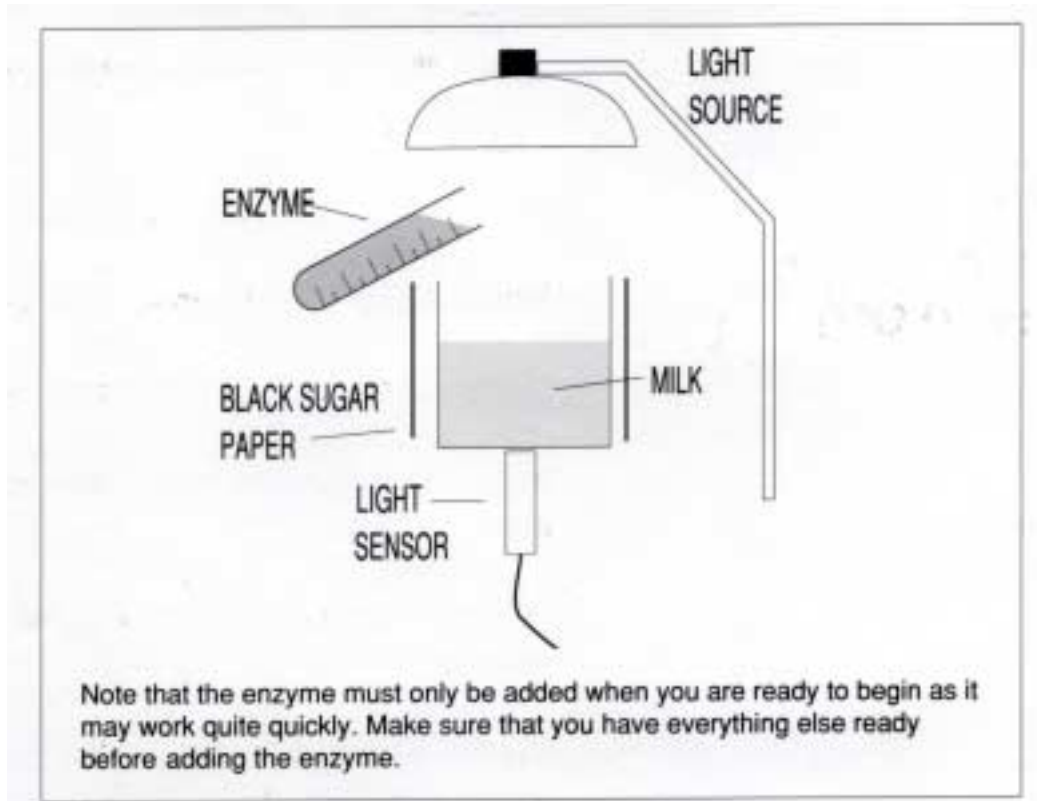


PLANTS AND ANIMALS

3. HOW EFFECTIVE IS AN ENZYME?

A new enzyme has been found which readily breaks down protein. A washing machine manufacturer has asked you to find out in which temperature range it works best. They require a report based on the 'milk test'. (An enzyme changes the milk from cloudy to clear as the protein is broken down).



PLAN How will you set up the experiment?

What are you going to measure?

Does the temperature of the mixture need to be controlled?

How much time do you need to allow the test to run?

How will you make sure that it is the enzyme breaking down the protein in the milk?

How will you ensure that it is a fair test?

APPARATUS

Light source and sensor
Temperature probe (optional)
Clamp and stands (2)
Masking tape
Black sugar paper
Beaker (50 or 100 ml)
Distilled water
Skimmed milk
Protease
Mixtures: 10 cm³ skimmed milk + 30 cm³ of water
5 cm³ of 2% enzyme solution

COMPUTER

Inputs: 1. Light
2. Temperature
Timespan 24 hours
Temperature range 0-45°C

DISCUSS AND FIND OUT

What was the light sensor actually measuring?

Work out the rate of reaction for each of the tests.

Which temperature range proved to be the best for the enzyme to work in?

Where in the body might you find protein-digesting enzymes?

Do the results suggest anything about one of the conditions that you might find here?

REPORT

Compile your report to the company, explaining what you have found out.

GOING FURTHER

Devise a test to see if the concentration of enzyme has any effect on the speed of the reaction. Explain how you did this and what you have found out.

What other factors might affect the rate at which protein-digesting enzymes work in the body? Can you devise an experiment to test your theory?