

2.4 Purpose of Test:

To demonstrate that an enzyme is sensitive to different ranges of temperature.

Apparatus & Chemicals :

3 x comboplates
3 x propettes
water bath
thermometer
lipase solution
sodium bicarbonate solution
universal indicator paper
plastic putty *boiling water *ice
*full cream / fresh milk

Procedure

1. In Comboplates A, B, and C use a propette to place in the well F1 of each comboplate.
 - a) 4 drops of milk.
 - b) 1 drop of lipase solution.
 - c) 1 drop of sodium bicarbonate solution
2. Place comboplate A in melting ice in a water bath - temperature 0° C and below.
3. Place comboplate B in warm water 37°C in a water bath
4. Place comboplate C in boiling water in a water bath - temperature about 100°C.
5. Support a thermometer in water bath B using plastic putty to fix it to the wall of the bath.
6. Set aside Comboplates, A, B and C in their water baths for two hours Top up the boiling water in C and ice in A to maintain the required temperature
7. After two hours use the indicator paper to test the pH of the contents in well F1 of Comboplates A, B and C.

Observations and questions

Well F1	Comboplate A	Comboplate B	Comboplate C
Temperature	-2°C to 0°C	37°C to 38°C	80°C to 100°C
pH at start	alkaline	alkaline	alkaline
pH an hour later			

1. Why is the solution made alkaline before lipase solution is added?
2. Why is the temperature 37°C used in a test of lipase action?
3. Where does the lipase action take place in the human digestive system?
4. Explain the pH observed for A. (-2°C to 0°C)
5. Explain the pH observed for B. (37°C to 38°C)
6. Explain the pH observed for C. (80°C to 100°C)