

### 2.3 Purpose of test

To demonstrate that an enzyme is pH sensitive.

#### Apparatus & Chemicals :

comboplate 3 x propette  
water bath thermometer  
lipase solution  
sodium bicarbonate solution  
universal indicator paper  
plastic putty  
\*full cream milk /fresh milk

**NB** Full cream milk contains fats.

#### Procedure

1. Using a propette, place 4 drops of milk into each of wells F1 and F2.
2. Using a propette, place 1 drop of lipase solution into each of wells F1 and F2.
3. Place a small piece of indicator paper into each of wells F1 and F2.
4. Using a propette, place 1 or 2 drops of sodium bicarbonate solution into F1 only to make the solution slightly alkaline.
5. Float the comboplate in a water bath at a temperature of 37°C–38°C for 2 hours. Top with warm water when necessary.
6. Use plastic putty to hold the thermometer against the inside wall of the water bath.
7. Observe colour of universal indicator paper in wells F1 and F2 at:
  - a) the start of the experiment
  - b) and after 2 hours

#### Observations and Questions

**NB** Note the digestion of fats in milk by the enzyme lipase - produces fatty acids and glycerol.

Observations		F1	F2
Start of test:	pH		
After 2 hours:	pH		

1. In which well has pH changed?

2. What was the difference between the F1 and F2 when the experiment was set up?
3. Did lipase action take place in F1? Explain your answer.
4. How did the change in pH come about in F1?
5. Did lipase action take place in F2? Explain.

### **Conclusions**

What do these results show about the enzyme lipase and the pH of the solution in which it works?