

What does pepsin do to egg whites?

Pepsin is an enzyme released by cells in the stomach lining which digests proteins into smaller pieces (called peptides). Because pepsin digests proteins, it would destroy the cells in which it is made. To avoid this, the enzyme is produced in an inactive form called pepsinogen which only becomes active when in the acidic environment of the stomach (which has a pH of 1.5-2). In this activity, you will explore the effect pepsin has on the protein found in egg white.

Procedure

- Q1.** a) Write a hypothesis about the effect pepsin will have on egg white.
b) What evidence would confirm your hypothesis?

1. Label 8 small test tubes (10 mL size) 1 through 8.
2. Prepare the tubes as outlined in Table 1. Use a piece of egg white small enough to fit inside the tube and try to make the pieces of egg white and potato the same size. Once you have the egg white and potato, slice each into four or five smaller pieces.

Table 1. Preparation of the tubes

Tube	Solution	Food
tube 1 & 2	5 mL water	-
tube 3 & 4	2.5 mL water + 2.5 mL 0.2% hydrochloric acid	egg
tube 5 & 6	2.5 mL 1% pepsin + 2.5 mL 0.2% hydrochloric acid	egg
tube 7 & 8	2.5 mL 1% pepsin + 2.5 mL 0.2% hydrochloric acid	potato

3. Vortex the tubes to mix the contents thoroughly.
4. Leave the odd numbered tubes at room temperature and place the even numbered tubes in the incubator at 37°C.
5. Let the tubes incubate overnight. Observe the tubes the next day and record your observations.

Questions

2. a) Describe the appearance of the egg white and the liquid in tubes 1-6. Account for any differences by explaining the specific effect pepsin is having on the egg white?
b) Do these results support or refute your prediction?
3. a) Why were tubes 1/2 and tubes 3/4 used?
b) Why was egg white used?
4. a) Why was the experiment performed at two different temperatures?
b) Describe and explain the effect, if any, of temperature. Was this expected?
5. Which test tube most closely resembles the conditions in the human digestive system?
6. a) What do you think happened in tubes 7 and 8?
b) Why were these tubes included?