

Name:	Date:
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## Experiment: Proteins in Food Clotting of protein

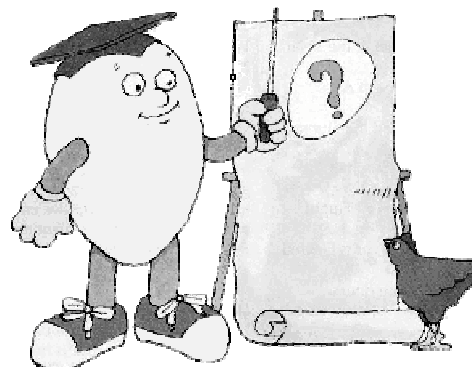
### Equipment

Hotplate, beakers, test tube racks, spatula or spoon

### Materials

Chicken egg, milk

Reagents: table salt, table vinegar (5 %), copper sulfate solution  
(5 g copper sulfate in 100 mL water)



### Safety and disposal guidelines

Copper sulphate solution: environmentally hazardous, R 52/53, S 61

Do not dispose of the solutions with copper sulphate through the drain, but collect it in a waste bottle.

### For all experiments:

Do not eat or drink during the experiments. After finishing the experiments put used gloves into the waste and always wash your hands thoroughly.

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### Introduction

Protein is an important nutrient for us. Proteins fulfil vital tasks in the human body. Not only chicken eggs, but also many other food products contain protein. Protein has an important characteristic that you are likely to know from your everyday life. Think of an egg you have for breakfast. How does it change when you boil it?

### Experiment

#### Preparation of an egg-white solution:

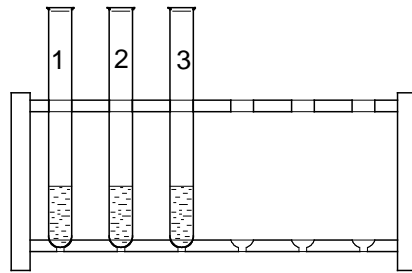
One or two pupils can prepare the egg-white solution as the prepared volume is sufficient for the whole group.

#### Preparation of a saline egg-white solution

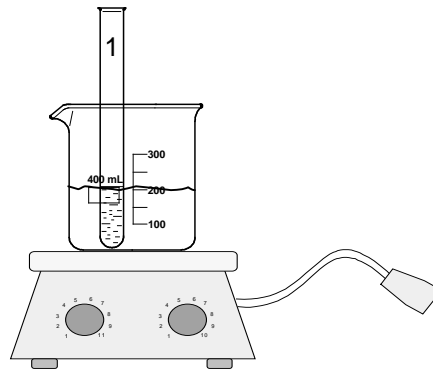
Add 15 g (about 3 teaspoons) of table salt to 150 ml of water and stir well until the salt is completely dissolved. Separate the egg white and yolk. Add the egg white to the salt solution and stir well.

**Experiment part A: Analysis of the egg-white solution**

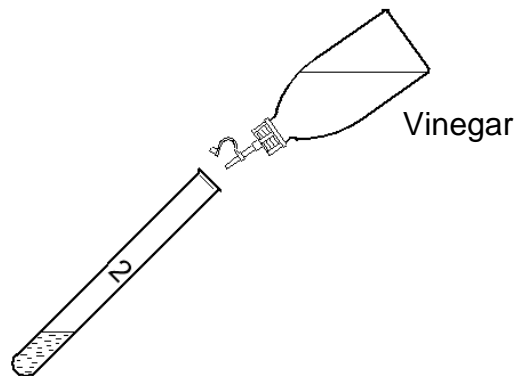
Pour 3 cm of the saline egg-white solution into each of the 3 test tubes.



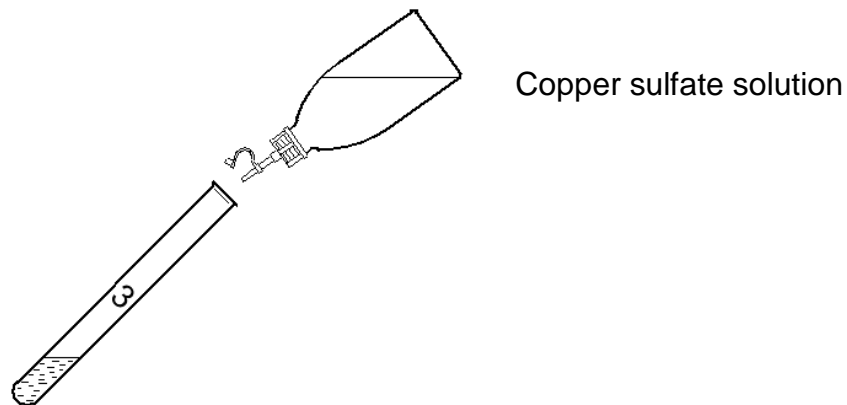
1. Carefully heat the first test tube in a water-filled beaker on a hotplate.



2. Add 5 to 10 drops of table vinegar to the second test tube and shake carefully.



3. Add 5 to 10 drops of copper sulfate solution to the third test tube and shake carefully.

**Observations:**

	Observation
1. Heating the egg-white solution	
2. Adding table vinegar to the egg white	
3. Egg white with copper sulfate solution	

This change in the egg white is called denaturation. Now think of whipping egg whites when you make a cake! What happens to the egg white?

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**Experiment part B: Analysis of proteins in other food products**

- Pour some milk into a test tube and add some table vinegar.

**Observations:**

	<b>Observation</b>
Milk	

In your daily life, you can come across this characteristic – the denaturation of proteins – quite frequently. Think of your boiled or scrambled egg, milk turned sour, cooked meat, etc. The change of protein caused by heat is also the reason why it becomes dangerous for the body if you run a fever that approaches 42 °C.