Food test:
Stability of foams - Effects of added ingredients

**Objective**

To investigate the effects of added ingredients on the stability of egg foams

**Principles**

One function of protein in cooking is forming foams. Foams are bubbles of air surrounded by a protein film. Egg whites will form foam when beaten. Factors such as the extent of beating, temperature, and added ingredients affect the stability of the foam formed.

**Equipment & materials**

|  |  |
| --- | --- |
| **Equipment** | **Materials** |
| ScaleSmall mixing bowlMeasuring spoonsPortable electric mixerRubber scraperFunnelsMeasuring cylinderTimer | 90g Sugar1 tsp Cream of tartar5 EggsPlastic wrap |

**Procedures**

1. Separate one egg white from the yolk. Place the egg white in a small mixing bowl.
2. Use the electric mixer to beat the egg white samples:

Sample 1: whip egg white on medium-low speed for 1 minute

Sample 2: whip egg white on medium-low speed for 1 minute and then slowly add 30g sugar

Sample 3: whip egg white and ¼ tsp cream of tartar on medium-low speed for 1 minute

Sample 4: whip egg white, ¼ tsp cream of tartar and ¼ tsp egg yolk on medium-low speed for 1 minute and then slowly add 30g sugar

Sample 5: whip egg white and ¼ tsp cream of tartar on medium-low speed until foamy (about 1 minute) and then slowly add 30g sugar

1. Beat the egg white at medium-high speed until soft peak forms (about 4 minutes).
2. Place a funnel on top of a measuring cylinder. Use a rubber scraper to put the foam into the funnel. Level the foam and cover the top of the funnel with plastic wrap. Allow it to sit for 20 minutes.
3. Record the volume of any leakage found in the measuring cylinder after 20 minutes.

**Results**

|  |  |  |  |
| --- | --- | --- | --- |
| **Sample** | **Ingredients** | **Texture after beating** | **Volume of leakage after 20 minutes** |
| **Egg white** | **Cream of tartar** | **Sugar** | **Egg yolk** |
| 1 | ✔ | 🗙 | 🗙 | 🗙 |  |  |
| 2 | ✔ | 🗙 | ✔ | 🗙 |  |  |
| 3 | ✔ | ✔ | 🗙 | 🗙 |  |  |
| 4 | ✔ | ✔ | ✔ | ✔ |  |  |
| 5 | ✔ | ✔ | ✔ | 🗙 |  |  |

**Questions**

1. What types of ingredients are more effective to maintain the stability of egg foams?
2. Besides the stability of egg foams, compare the effects of the ingredients on the texture of the foams.
3. State 2 applications of egg foams in the production of food products.