

Kids in the Kitchen

Making Meringues



A great way to learn about proteins!

Meringues are so yummy, sweet, light and airy. They taste a bit like marshmallows or fairy floss. Meringues are mostly protein and sugar. In this activity we will make meringues while learning about proteins.



Safety Tip: This cooking activity involves using a mixer or beaters, and a hot oven, so adult help will be needed. It is not suitable for kids with egg allergies.



What are proteins?

Proteins are so small we can't see them without a microscope, but they're essential for us to grow. Proteins are found in most foods, which is lucky because we cannot exist without them!

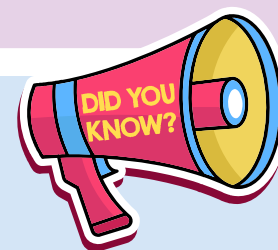
Proteins are molecules. When we look at proteins closely, we can see that they often look like strings or ribbons. They can be straight, or twisty and curly.

We can play with proteins and make them do different things, which we will see in this activity. Let's cook!



Recipe

- Recommended for: 8 years and older with adult assistance
- Recipe preparation time: 15 to 30 minutes, depending on age
- Cooking time: 2 hours
- Makes: approximately 40 small meringues



At Telethon Kids we have teams of researchers that work with proteins, including in nutrition, gut health, immune systems, diabetes and new medicine development. In fact, we even have Protein Engineers – that's a real job!



Ingredients

- 4 large egg whites at room temperature
- 1/2 teaspoon cream of tartar (or 1 teaspoon of vinegar)
- 1 cup of caster sugar
- 1 teaspoon of vanilla extract



Egg whites are about 90% water and 10% protein with traces of other things. For this recipe we can't have any egg yolk in with the egg white.





Instructions

1. Preheat the oven to 100 degrees Celsius. Line two baking trays with baking paper.

Science tip:



We set the oven at a low temperature because when we bake the meringues, they need to be in the oven for a long time so the water can evaporate. But we don't want them to cook too much so we don't use a hotter oven.

2. Get a glass or metal bowl. Make sure it is very clean and dry.

Science tip:



The bowl needs to be very clean and dry because things like grease or water will interfere with the egg white proteins when we are cooking. We can't use a plastic bowl because they tend to have scratches that retain oils and fats which may ruin your meringue.

3. In the bowl, place the egg whites and cream of tartar (or vinegar).

Science tip:



We add cream of tartar or vinegar because they are an acid. The acid helps to 'stabilise' the proteins in the egg whites as we cook, which means it helps them to keep their shape. You could use a teaspoon of another acid instead, such as lemon juice.

4. Use electric beaters or a stand mixer and stir the ingredients together on low speed until it becomes foamy.

Science tip:



Warmer egg whites will foam up more than cold egg whites from the fridge. This is because the proteins can move more when it is warmer, which is better for making meringues.

5. Increase the mixing speed to high and gradually add the sugar. Add about one tablespoon at a time and mix for 10 to 20 seconds between each spoonful.

Science tip:



In this step, you're adding air to make it foamy, plus you are transforming the proteins! By whisking the egg whites, you are changing the curly proteins into straighter ones. These straighter proteins can hold the air bubbles being added. That is how the mixture becomes thicker and foamier.

6. Beat the meringue until it is thick, shiny and it has increased in volume. The meringue is ready when you can put a utensil into the mixture and pull it to form a stiff peak. The sugar should be dissolved too, so rub some meringue between your fingers. If it feels gritty from the sugar, then you need to beat the meringue longer until the sugar dissolves.

Science tip:



The sugar gives the meringue more strength to hold its foamy shape. The sugars combine with the proteins to make the structure stronger. Sugar also makes the meringues taste better!

Stiff Peaks



7. Stir in the vanilla extract for flavour. You could also add food colouring in this step if you wish.

8. Place spoonfuls of the meringue on the baking trays or use a piping bag with a large tip to make meringue swirls.



The meringues now have a strong structure and they won't rise or spread out much when cooking in the oven, so you can place them close together on the baking trays.

9. Bake in the oven at 100 degrees Celsius for 1 hour. After the hour, turn the oven off but don't open it – leave the door closed and allow the meringues to cool in the oven for another hour before taking them out.



By cooking using a low temperature, the water is evaporating while the proteins are hardening. By the end of the cooking time the protein structure will become practically solid, so we will be able to pick the meringues up with our hands and eat them!

10. Check that the meringues are cool, then enjoy eating them! Munch munch munch!



Keep meringues in an airtight container so that moisture in the air cannot seep into the meringues and make them soft.

Learning Summary

Proteins are molecules that are important for our bodies. Proteins are found in most foods. Proteins look like long strings that can be straight or twisty and curly. We can change proteins with energy and heat to make them do different things, such as turn egg whites into delicious meringue!