

SCIENCE FROM HOME

HOMEMADE BUTTER

Instructions:

1. Make sure your container and small objects are clean
2. Fill your container about $\frac{1}{2}$ full of cream
3. Add the small objects (if using) to the container
4. Place the lid on tightly
5. Shake your container, check occasionally to see the change as the fat and water start to separate.
6. Stop shaking when you are happy with the consistency of your butter
7. Taste and enjoy!

Questions:

What component of milk becomes butter?

What changes about the fat in milk to make it into butter?

Is making butter a physical or chemical change?

How it works:

Butter is an emulsion of fat made from milk. An emulsion is a mixture of two or more normally unmixable liquids, where one liquid is present as very small droplets within the other. The fat and water in milk and cream don't usually like to mix, but because the fat is in very small droplets it stays suspended in milk. The agitation of the jar causes those small droplets of fat to bump into each other and stick together. When this happens enough, the fat and water separate into butter and buttermilk.

Going beyond:

Does using small objects change the texture, or other aspects of the butter?

Does the time needed to make butter change when the amount of cream, container size, or other factors are altered?

Materials:

Heavy cream

Jar, bottle, or other container with a tight fitting lid

Optional:
marbles, dice, or similar small objects

Key terms:

Hypothesis

Emulsion

Separation

