

# Curds and Whey

Celebrate National Cheese Day with this cheesy chemistry experiment!

## Collect

- 3 cups whole milk (pasteurized milk will work)
- Salt
- Distilled white vinegar
- Apple cider vinegar
- Lemon juice
- Cheesecloth or Colander
- Large slotted spoon
- 3 microwave-safe bowls
- 3 small plates



## Prepare the milk

1. Pour 1 cup of milk into each bowl. Add a small pinch of salt to each bowl and mix well.

*Hint: Ultra-pasteurized milk is heated to a much higher temperature during the pasteurization process and will not make good cheese curds, but regular pasteurized milk will work well.*

2. Add 1 tablespoon of distilled white vinegar to the first bowl. Add 1 tablespoon of apple cider vinegar to the second bowl. Add 1 tablespoon of lemon juice to the third bowl.

## Separate the curds and whey

3. Place the first bowl in the microwave and cook on high for 2 to 4 minutes. Keep an eye on the milk so that it doesn't boil over.
4. If the curds (solids) have formed, gently stir to separate from the whey (liquid). If the curds haven't separated, microwave again for 30 seconds at a time until curds form.
5. Line the inside of the colander with cheesecloth and use the spoon to scoop the curds from the bowl into the colander. Let it drain for a few minutes.
6. Label the first plate "distilled white vinegar" and place your finished cheese on the plate.
7. Repeat steps 3-6 with the remaining two bowls, making sure to label the plates accordingly.

## It's time for a taste test!

8. Try a little bit of each type of cheese. Can you taste a difference between the white vinegar and apple cider vinegar? What about between the vinegars and lemon juice? Which one is your favorite?
9. Share some of your cheese with friends or family members and then make a chart to record everyone's favorite.

## Take it further!

Once you figure out your favorite acid to use, play around with your cheese a little bit. You can change the texture of your



cheese depending on how long you let it drain. For a super creamy texture, drain and eat your cheese right away. For a more firm and crumbly texture, leave it to drain overnight in the refrigerator. You can also try seasoning your cheese. Add a little bit of cinnamon and sugar for a sweet spread, some dried for a savory spread, or even fresh citrus zest from a lime or lemon.

## How does it work?

The cheese made during this experiment is the result of a chemical reaction between the milk and the acid. Milk contains a protein called casein and when you add an acid (like vinegar or lemon juice) it causes those proteins to clump together. The solid clumps are called curds, and the leftover liquid is called whey—just like in “Little Miss Muffet!”

