

Curds and Whey: A Milky Experiment

Little Miss Muffet sat on her tuffet eating her curds and whey ...

Have you or your child ever heard that nursery rhyme and wondered just what curds and whey were? Do this simple, and, yes, gross, experiment together to find out!

What You Need:

- Measuring cup and spoons
- Skim milk
- Clear glass cup
- White distilled vinegar

What You Do:

1. Measure $\frac{1}{4}$ cup of skim milk and pour it into the glass.
2. Measure 2 tablespoons of vinegar and pour into the milk.
3. Stir the vinegar and milk together then observe!
4. Extend the experiment by using other types of milk as well (1%, 2%, whole). Try curdling the milk with lemon juice, another weak acid. Are the results the same?



What Happened?

Milk is a colloid. A colloid is a mixture of substances that do not settle out over time (like a mixture of sand and water would for example). Unlike a suspension (sand and water or orange juice and pulp) that mixes together when stirred or shaken then settles into separate parts when left at rest, a colloid does not settle because the particles that make it up are extremely tiny.

Looking at a glass of milk, one would not be able to see the particles that make it up, namely the curds (solid casein protein particles) and whey (liquid particles) because they are so small. (Interestingly, milk appears white even though the particles that make it up are mostly clear, because light is scattered by the tiny particles as it passes through the colloid.) The milk was “curdled” when the acidic vinegar was added and lowered the pH of the milk, causing the casein particles to come out of the solution as solid chunks of curds floating in the liquid whey. Gross - definitely don't drink!

Want more milk science? Check out Ick Can Stick! Make Milk Glue for another fun activity.

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