



MAKING VINEGAR FROM APPLE CIDER

with Wild Yeast Fermentation

In this experiment, we'll use wild yeast (naturally present in the environment) to ferment apple cider into alcohol, then use acetic acid bacteria (also wild) to turn the alcohol into vinegar.

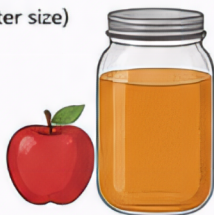
WHAT'S HAPPENING?

This is a two-step fermentation.

- Alcoholic Fermentation:** Wild yeast eats the natural sugars in apple cider and produces alcohol (ethanol) and carbon dioxide.
- Acetic Acid Fermentation:** Acetic acid bacteria use the alcohol and oxygen to create acetic acid — that's vinegar!

MATERIALS

- Unpasteurized apple cider (not from concentrate)
- Clean glass jar with wide mouth (1 quart / 1 liter size)
- Clean cloth or paper towel
- Rubber band
- 2nd clean glass jar or bottle with wide mouth
- Funnel
- Coffee filter or clean cloth
- Optional: pH strips (range 2–6)



GOOD TO KNOW

We're not adding commercial yeast or bacteria. They are all around us—on the apple skins, in the air, and in the environment!

THE FERMENTATION JOURNEY

APPLE CIDER
(SUGARS)



Wild Yeast
(anaerobic
— little/no
air)

Phase 1
3–7 days

APPLE CIDER
ALCOHOL
(ETHANOL)



Acetic Acid
Bacteria
(oxygen
needed)

Phase 2
2–6 weeks

VINEGAR
(ACETIC ACID)



PROCEDURE

PHASE 1: ALCOHOLIC FERMENTATION (3–7 DAYS)

- Pour apple cider into a clean wide-mouth jar, leaving about 2 inches (5 cm) of space at the top.
- Cover the opening with a clean cloth or paper towel and secure with a rubber band.
- Place the jar in a warm spot (65–75°F / 18–24°C) out of direct sunlight.
- Check daily. You may see bubbles, foam, or a fruity smell. This is normal!
- After 3–7 days, the bubbling should slow down and the smell may become more like alcohol or less sweet. It's ready for Phase 2.

PHASE 2: ACETIC ACID FERMENTATION (2–6 WEEKS OR MORE)

- Pour the cider through a funnel and coffee filter (or clean cloth) into a second clean wide-mouth jar or bottle. This removes solids.
- Cover again with a clean cloth or paper towel and secure with a rubber band.
- Place in a spot with good air flow and a stable temperature (65–75°F / 18–24°C).
- Check every few days. You may see a cloudy film or "mother" forming on the surface—this is good!
- Taste after 2 weeks. Continue for up to 6 weeks or more until it tastes as tangy as you like.
- When it tastes like vinegar, strain again if needed and store in a clean bottle with a lid. The vinegar will continue to develop flavor over time.

OBSERVATIONS & DATA

Day/Date	What I See	What I Smell	Taste (if any)	pH (optional)

CONCLUSION

What happened during Phase 1? _____

What happened during Phase 2? _____

What did I learn? _____

What could I try next time? _____



SAFETY FIRST

Use clean jars and tools.
Do not use metal lids during fermentation.
Do not consume if it smells bad, has mold colors (black, green, pink), or tastes off.



TIP

Time can vary depending on temperature, the cider, and the wild microbes present. Be patient and observe!



YOU DID SCIENCE!

You turned simple apple cider into vinegar using natural microbes and time!