



NUTRITION

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7 Side Effects of Too Much Apple Cider Vinegar

By Franziska Spritzler — Medically reviewed by [Kathy W. Warwick, R.D., CDE](#), Nutrition — Updated on December 8, 2021



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Apple cider vinegar is a natural tonic. It has [several health benefits](#) that scientific studies in humans support.

However, people have also raised concerns about its safety and possible side effects.

This article takes a look at apple cider vinegar's potential side effects and provides instructions on how to consume apple cider vinegar safely.

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What is apple cider vinegar?

Apple cider vinegar is made by combining [apples](#) with yeast.

The yeast converts the sugar in the apples into alcohol. Bacteria are then added to the mixture and ferment the alcohol into acetic acid (1[✓]).

Acetic acid makes up 5–6% of apple cider vinegar. It's classified as a “weak acid” but still has fairly strong acidic properties when it's concentrated.

In addition to acetic acid, vinegar contains water and trace amounts of other acids, vitamins, and minerals (1[✓]).

Several studies in animals and humans have found that [acetic acid](#) and apple cider vinegar [may](#) promote fat burning and weight loss, decrease blood sugar levels, increase insulin sensitivity, and improve cholesterol levels (2[✓], 3[✓], 4[✓], 5[✓]).

Unfortunately, human studies supporting daily use of apple cider vinegar are lacking, and more research is needed (6[✓]).

SUMMARY

Apple cider vinegar is made from acetic acid, which may contribute to weight loss and health benefits such as lower blood sugar and healthier cholesterol levels.

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Unfortunately, apple cider vinegar has been reported to cause some side effects.

This is particularly true when it's consumed in large doses.

Although small amounts are generally fine and healthy, consuming too much can be harmful and even dangerous.

1. Delayed stomach emptying


Small studies in humans have suggested that apple cider vinegar may reduce the rate at which food leaves the stomach and enters the lower digestive tract. This could slow the absorption of nutrients into the bloodstream.

However, this effect may worsen symptoms of [gastroparesis](#) , a common condition that affects people [living with diabetes](#).

In gastroparesis, the nerves in the stomach don't work properly, so food stays in the stomach too long and is not emptied at a normal rate.

Symptoms of gastroparesis include heartburn, [bloating](#), and nausea. For people who have both type 1 diabetes and gastroparesis, timing insulin with meals is very challenging because it's hard to predict how long food will take to be digested and absorbed.

One controlled study looked at 10 patients with type 1 diabetes and gastroparesis.

Drinking water with 2 tablespoons (30 mL) of apple cider vinegar significantly increased the amount of time food stayed in the stomach, compared to drinking plain water (7 )

Newer research is needed to better understand apple cider vinegar's effect on blood sugar.



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Research suggests apple cider vinegar may slow the rate at which food leaves the stomach. This may worsen symptoms of gastroparesis and make blood sugar management more difficult for people with type 1 diabetes.

2. Digestive side effects

Apple cider vinegar may cause unpleasant digestive symptoms in some people.

Human and animal studies have found that apple cider vinegar and acetic acid may decrease appetite and promote feelings of fullness, leading to a natural reduction in calorie intake (8[✓], 9[✓]).

However, one controlled study suggests that in some cases, appetite and food intake may decrease due to indigestion.

The people who consumed a drink containing 25 grams (0.88 ounces) of apple cider vinegar reported less appetite but also significantly greater feelings of nausea, especially when the vinegar was part of an unpleasant-tasting drink (10[✓]).

2 TBSP = 30 mL =
30 grams

SUMMARY

Apple cider vinegar may help reduce appetite, but it may also cause feelings of nausea, particularly when consumed as part of a drink with an unpleasant flavor.

3. Low potassium levels and bone loss

There are no controlled studies on apple cider vinegar's effects on blood

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However, there is one case report of low blood potassium and bone loss that was attributed to large doses of apple cider vinegar taken over a long period of time.

A 28-year-old woman consumed 8 ounces (250 mL) of apple cider vinegar diluted in water on a daily basis for 6 years.

She was admitted to the hospital with **low potassium** levels and other abnormalities in blood chemistry (11).

What's more, the woman was diagnosed with osteoporosis, a condition that causes brittle bones and is rarely seen in young people.

Doctors who treated the woman believe the large daily doses of apple cider vinegar led to minerals being leached from her bones to buffer the acidity of her blood.

They also noted that high acid levels can reduce the formation of new bone.


Of course, the amount of apple cider vinegar in this case was much more than most people would consume in a single day — plus, she did this every day for many years.

SUMMARY

There is one case report of low potassium levels and osteoporosis likely caused by drinking too much apple cider vinegar.

only one case, no causality established. other metabolic markers such as vitamin d, magnesium, inflammation


4. Erosion of tooth enamel

Acidic foods and beverages have been shown to damage tooth enamel (12 )


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Soft drinks and fruit juices have been more widely studied, but some research shows the acetic acid in vinegar may also damage tooth enamel.

In one lab study, enamel from wisdom teeth was immersed in different vinegars with pH levels ranging from 2.7–3.95. The vinegars led to a 1–20% loss of minerals from the teeth after 4 hours (13 )

Importantly, this study was done in a lab and not in the mouth, where saliva helps buffer acidity — and a person would not hold vinegar in their mouth for 4 hours. Nevertheless, there's some evidence that large amounts of vinegar may cause dental erosion.

A case study also concluded that a 15-year-old girl's severe dental decay was caused by consuming 1 cup (237 mL) of undiluted apple cider vinegar per day as a [weight loss aid](#) (14 )


SUMMARY

The acetic acid in vinegar may weaken dental enamel and lead to loss of minerals and tooth decay.

5. Throat burns

Apple cider vinegar has the potential to cause esophageal (throat) burns.


A review of harmful liquids accidentally swallowed by children found that acetic acid from vinegar was the most common acid that caused throat burns.

Researchers recommended that vinegar be considered a “potent caustic substance” and kept in childproof containers (15 )

There are no published cases of throat burns from apple cider vinegar itself.

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However, one case report found that an apple cider vinegar tablet caused burns after becoming lodged in a woman's throat. The woman said she experienced pain and difficulty swallowing for 6 months after the incident (16 )

SUMMARY

The acetic acid in apple cider vinegar has caused throat burns in children. One woman experienced throat burns after an apple cider vinegar tablet became lodged in her esophagus.

6. Skin burns

Due to its strongly acidic nature, apple cider vinegar may also cause burns when applied to the skin.

In one case, a 14-year-old girl developed erosions on her nose after applying several drops of apple cider vinegar to remove two moles, based on a protocol she'd seen on the internet (17 )

In another, a 6-year-old boy with multiple health problems developed leg burns after his mother treated his leg infection with apple cider vinegar (18).

There are also several anecdotal reports online of burns caused by applying apple cider vinegar to the skin.

SUMMARY

There have been reports of skin burns occurring in response to attempts to treat moles and infections with apple cider vinegar.

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7. Drug interactions

A few medications may interact with apple cider vinegar:

- **Diabetes medication.** People who take insulin or insulin-stimulating medications and consume vinegar may experience dangerously low blood sugar or potassium levels.
- **Digoxin (Lanoxin).** This medication lowers your blood potassium levels. Taking it in combination with apple cider vinegar could lower your potassium too much.
- **Certain diuretic drugs.** Some [diuretic medications](#) cause your body to excrete potassium. To prevent potassium levels from dropping too low, do not consume these drugs with large amounts of vinegar.

SUMMARY

Some medications, including insulin, digoxin, and certain diuretics, may interact with apple cider vinegar.

How to consume apple cider vinegar safely

Most people can safely consume reasonable amounts of apple cider vinegar by following these general guidelines:

- **Limit your intake.** Start with a small amount and gradually work up to a maximum of 2 tablespoons (30 mL) per day, diluted in water, depending on your personal tolerance.
- **Minimize your tooth exposure to acetic acid.** Try diluting the vinegar in water and drinking it through a straw.
- **Rinse your mouth.** Rinse with water after taking it. To prevent further enamel damage, wait at least 30 minutes before brushing.

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- **Consider avoiding it if you have gastroparesis.** Avoid apple cider vinegar or limit the amount to 1 teaspoon (5 mL) in water or salad dressing.
- **Be aware of allergies.** Allergies to apple cider vinegar are rare, but if you experience an allergic reaction, stop taking it immediately and call your doctor.

SUMMARY

To consume apple cider vinegar safely, limit your daily intake, dilute it, and avoid it if you have certain conditions.

The bottom line

Apple cider vinegar can provide several health benefits.

However, to stay safe and prevent side effects, it's important to monitor the amount you consume and be careful with how you take it.

While a small amount of vinegar can be good, more isn't better and may even be harmful.

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