

Fire Shot Ingredient Report

Apple Cider Vinegar

What is it:

Apple cider vinegar (ACV) is made by crushing apples and adding bacteria and yeast to cause fermentation.^{1,2} The natural sugars in the apples are fermented by microorganisms which create ethanol. Ethanol is converted further into acetic acid. Apple cider vinegar also contains other acids including malic, lactic, and citric acids. It contains pectin, vitamins, and minerals.^{1,2} The potential health benefits of ACV are largely attributed to its acetic acid content.

Why is it used:

Apple cider vinegar is used for culinary purposes (such as in salad dressings and cooking), along with being used as a supplement to help with a variety of medical conditions.¹ Individuals commonly use ACV for the following:¹

- Diabetes
- Weight loss
- Leg cramps and leg pain
- Gastric reflux
- Gastroparesis (slow stomach emptying)
- Sore throat
- Hypertension, Osteoarthritis
- Detoxification
- To promote cognitive function
- Hyperlipidemia
- Infections including sinus infection
- Osteoporosis
- Kidney stone prevention
- To help with aging process

What does the science say?

Blood Sugar Control

Apple cider vinegar when taken in liquid form may lower the rise in blood sugar after eating.² Elevated blood sugar levels have been linked to increased risk for chronic diseases including type 2 diabetes and can raise inflammation in the body. Healthy individuals who do not have diabetes who consume apple cider vinegar with a meal may reduce the rise in blood sugar levels that occur after eating.^{2,3} In one study subjects consumed half of a tablespoon of ACV diluted in water (or 1.5 teaspoons) with a high carbohydrate meal and this reduced their blood sugar levels one hour after eating compared to when ACV was not taken with the meal.^{2,4} Another study found that healthy subjects consuming 1 and $\frac{3}{4}$ tablespoons of liquid ACV with a meal had lower

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average blood sugar levels 30 minutes after that meal compared to when ACV pills were used, or when ACV was not taken with the meal.²

Research has also analyzed whether taking ACV is beneficial for those who have insulin resistance and diabetes. One study found that consuming 0.5 tablespoons of ACV (1.5 teaspoons) diluted in water before a meal lowered blood sugar levels in insulin resistant individuals and improved insulin sensitivity.^{2,5} In the subjects with type 2 diabetes there was some improvement in insulin sensitivity, however, no significant improvements in blood sugar levels were found.^{2,5} Taking apple cider vinegar (2 tablespoons, diluted) with a bedtime snack was found to help lower blood sugar levels in type 2 diabetic subjects the next morning.^{2,6} Other research has found that taking a daily dose of 1 tablespoon ACV diluted in water with a meal can help to lower blood sugar, triglyceride, and cholesterol levels in individuals who have diabetes.² Consuming little more than ½ tablespoon of ACV added to water taken before 2 meals per day may reduce blood sugar levels and improve insulin sensitivity in diabetics.^{2,7}

Weight Loss

Limited research supports that apple cider vinegar may be helpful in promoting weight loss. One study found that vinegar intake lowered body weight, body mass index, visceral fat (fat stored in the abdominal area), waist circumference, and triglyceride levels.⁸ Another study found that taking apple cider vinegar with meals (1 tablespoon) for 1 month resulted in lower body weight and hip circumference compared to the group that did not receive apple cider vinegar. Also, the study participants who consumed apple cider vinegar reported that they had less of an appetite. This study – like the previous study mentioned – showed a decrease in triglyceride levels in the group that received apple cider vinegar. Apple cider vinegar intake was also associated with an increased HDL cholesterol level (the “good” cholesterol).⁹

According to Natural Medicines Database, more research is needed before we can rate the effectiveness of apple cider vinegar for weight loss.¹

Immunity

Evidence is currently lacking to support using ACV for immune benefits. Although specific studies assessing ACV’s effect on immune function are lacking, it is important to consider the fact that apple cider vinegar is known to have antimicrobial properties. The antimicrobial properties of ACV are largely attributed to its organic acid content (including acetic acid and other organic acids).

Other

Antioxidant activity: Apple cider vinegar contains antioxidants including polyphenolic compounds and vitamins which can help the body combat damage from oxidative stress. A few of the polyphenolic compounds in ACV include gallic acid, catechin, epicatechin, chlorogenic acid, and p-coumaric acid.

Blood pressure lowering effects: Apple cider vinegar contains acetic acid which has been found to have a blood pressure lowering effect.

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Cardioprotective properties: Apple cider vinegar intake has been found to help raise HDL cholesterol levels and lower triglyceride levels. Due to its polyphenol content it may help in inhibiting LDL or “bad cholesterol” oxidation which can increase risk for cardiovascular disease. The acetic acid content in ACV has also been attributed to promoting cardioprotective effects.

Safety

Considered safe when used orally in a diluted form. Apple cider vinegar that claims it is >20% acetic acid can be unsafe and even dangerous.^{1,2} Acetic acid can damage tooth enamel so it's important to not let ACV linger in your mouth too long before swallowing.²

Side effects

Side effects may only result if apple cider vinegar is being used in high doses and/or with long-term use. These side effects may include low blood potassium levels and osteoporosis.¹

Dosing

Taking ACV 20 grams with meals has been used in clinical studies to improve blood sugar control.¹ To lower blood sugar spikes after meals ½ tablespoon of apple cider vinegar diluted with water taken with a meal has been used.² For weight loss taking ACV 15mL twice daily (2 tablespoons total per day) with meals has been used.^{1,2} Studies have also supported using ½ tablespoon of ACV taken twice daily with meals to promote weight loss.²

Practical uses: In foods and beverages.

Summary and Recommendations

Apple cider vinegar may help to lower blood sugar levels after eating and may assist with weight loss. There is currently limited evidence to support using ACV for immunity, although ACV does have antimicrobial properties. Apple cider vinegar contains acetic acid of which many of its potential health benefits are attributed to. There is currently no research to suggest using ACV in pill or powder forms which makes liquid ACV the best form to use. Typically, one teaspoon to one tablespoon of ACV is diluted in about 1 cup of water and taken before or with meals.

Apple cider vinegar has many beneficial nutrients and health-promoting components to it besides acetic acid including vitamins (b vitamins, vitamin C, etc.), minerals (phosphorous, potassium, calcium, iron, magnesium), and polyphenols which have antioxidant properties.

In summary ACV safe to use; there are no known adverse effects when taken at doses commonly found in foods and beverages. It may have health benefits and can contribute to a desirable flavor profile of foods and beverages.

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Ginger Juice

What is it:

The juice from the ginger spice that comes from the tuberous rhizome of the ginger plant. It is native to Asia and has been cultivated in the Middle East for medicinal and culinary purposes.¹⁰

Active components of ginger root include gingerol, gingerdione, shogaol, sesquiterpene and monoterpene volatile oils.¹⁰

What is it used for?

For culinary purposes it is commonly used as a flavoring agent. People also use ginger for medicinal purposes including the following:¹⁰

- Motion sickness
- For nausea and vomiting
- Loss of appetite
- Arthritis
- Menstrual cramps and menstrual periods with abnormally heavy or prolonged bleeding
- Migraines
- Hypertension
- Promote immune function
- Diabetes
- Stomachache

What does the science say?

Ginger has anti-inflammatory, antioxidant, antibiotic, antifungal, and other properties which contribute to its beneficial health effects.¹¹

Menstrual cycle pain: Ginger may be useful in lowering menstrual cycle pain.¹⁰

Migraine and pain relief: There is some evidence that ginger may be helpful for alleviating pain associated with migraines.¹⁰ A possible mechanism of action includes 6-shogaol in ginger and impacting release of substance P which is implicated in inflammation and pain.^{10,12} It may be beneficial for those with osteoarthritis. Doses of 1 gram of ginger extract have been used.^{10,11}

Antimicrobial: There is some evidence to suggest ginger may be beneficial for bacterial infections and fungal infections.¹⁰

Digestive health: Ginger has been used traditionally as a digestive aid. Animal models and preliminary research have found that gastroprotective effects of ginger might be due to increases in protective chemicals in the gut.^{10,13} Animal research has also attributed its anti-inflammatory and antioxidant properties to its positive effects on gastrointestinal health.^{10,14} Other research conducted in animals has found that the zingiberene and 6-gingerol may be the important

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components in ginger contributing to beneficial digestive health effects.^{10,15} Ginger also may help to promote gastrointestinal tract motility.^{10,16}

Effects on Diabetes and blood sugar: Animal and human research suggests that ginger may be beneficial for regulating blood sugar levels. Ginger juice has been shown in animal models to have anti-diabetic properties.^{10,17,18} In a human trial ginger was found to improve insulin sensitivity (which helps regulate blood sugar) and produce favorable effects on blood lipid levels in diabetic patients.¹⁹

Nausea: Doses of 1 gram of ginger root powder (a little less than ½ teaspoon) daily may help with nausea.¹¹ The mechanism of action for how exactly ginger can help with nausea and vomiting is currently unclear however, several proposed mechanisms exist.¹⁰ The gingerols and shogaols may be responsible for its anti-nausea and vomiting properties.^{10,20} Because of its potential effects on increasing gastrointestinal tract motility, this may be another potential reason why ginger may have antiemetic properties.¹⁰ Other proposed mechanisms have been identified and more research is currently needed.

Immune Function: Some studies suggest that ginger is a natural immune booster.^{21, 22} It appears ginger – due to its antioxidant and anti-inflammatory effects – may support the immune system. It has antibiotic, weak antifungal, & other properties.¹⁰ More research is currently needed in this area.

Safety: When used orally ginger is considered safe.

Adverse effects: Orally ginger is well tolerated. High doses (>5 grams per day) may increase risk for side effects including abdominal discomfort, heartburn, diarrhea, and oral irritation.¹⁰

Dose:

Osteoarthritis: Taking 1g ginger extract has been utilized in clinical studies.¹⁰

Menstrual Cramps: Ginger extract 250mg four times daily for 3 days has been used. Ginger powder 1500mg/day in 3 divided doses has been used.¹⁰

Diabetes and Blood Sugar Control: Powdered ginger 1g 2-3 times daily has been used. Ginger taken at 3 grams daily has also been used in clinical studies.¹⁰

Dosage for utilizing ginger for other potential health effects including to support immunity is currently unknown at this time. More research is needed in this area.

Practical uses: In foods and drinks to contribute flavor, beneficial nutrients, and health promoting properties.

Summary and Recommendations: Ginger is considered safe and studies have shown it has anti-inflammatory, antioxidant, antibiotic, antifungal, and other properties which contribute to its potential health benefits. The evidence is strong to support using ginger to help with nausea, stomach upset, to reduce pain associated with osteoarthritis, and for helping with menstrual

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cramps. Ginger may support immune function, although more research is needed in this specific area. Regarding specific dosages for immune function more research is currently needed.

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Garlic Juice

What is it: A culinary herb in the allium plant family. It is used medicinally in a variety of forms including as a juice, fresh, dried, or powdered.

Why is it used: Garlic is commonly used for the following:²³

- Hypertension
- Hypotension
- Hyperlipidemia (elevated cholesterol or blood lipids)
- Heart disease
- Metabolic syndrome
- Obesity
- Earaches
- Chronic Fatigue Syndrome
- Menstrual disorders
- Gastritis
- H Pylori infection
- Prevent cancer
- Diabetes
- Osteoarthritis
- Allergies
- Flu
- Prevention of common cold
- Prevention and treatment of common bacterial and fungal infections
- Exercise performance
- Diarrhea
- Joint pain
- Hemorrhoids
- Asthma
- Allergies
- Stress

What does the science say?

Heart Disease: Taking garlic may prevent heart disease. Studies have found it may help to prevent clogging of the arteries and slow atherosclerosis progression.^{25,26} Furthermore, garlic may lower cholesterol and blood pressure levels which can contribute to its heart-protective properties.^{23,24} According to some research garlic may lower not only total cholesterol levels but also the LDL or “bad” cholesterol levels, along with triglyceride levels.²³

Blood sugar regulation: Garlic has been found to help regulate blood sugar levels. More specifically, garlic has been found to help lower fasting blood sugar levels.^{23,24,27}

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Immune Function: A well designed study has supported the use of garlic for preventing the common cold.²⁴ Garlic may enhance natural killer (NK) cells which are components of the innate immune system. Garlic juice has been shown to increase NK cell activities.²⁸ Overall it appears garlic has properties to support the immune system which plays a role in its anticancer properties (see below Cancer Prevention section).^{23,24} It is important to note many of the studies on garlic and immunity have been conducted in animal models.

Cancer prevention: Garlic may help to prevent certain types of cancer including gastric, prostate, and colorectal cancers.²⁴

Safety: Considered safe when used orally and appropriately.

Adverse effects: Common side effects of garlic consumption may include bad breath and body odor. At high doses garlic may cause other adverse effects such as gastrointestinal upset and increased risk of bleeding. Garlic taken at doses typically found in food do not usually cause adverse effects.

Dose: More research is needed at this time on specific dosages for garlic juice. See below for research-based recommendations for dosing of other forms of garlic.²³

Atherosclerosis: Garlic powder 300mg 1-3 times daily has been used.

Colorectal cancer prevention: Aged garlic extract 2.4mL per day has been used.

Common cold prevention: A capsule containing Allicin from garlic taken daily during the winter months has been used.

Coronary Heart Disease: 150 mg of garlic in capsule form has been used for 12 months.

Diabetes: Garlic powder 600-1500 mg daily has been used. Garlic powder 300mg multiple times a day have also been used in combination with Diabetes medications.

Elevated cholesterol/blood lipids: Aged garlic extract 1000-7200mg daily has been used. Garlic powder 600-900mg daily has also been used. Another study utilized garlic powder 300mg taken twice daily. Lastly, other research has used garlic powder in combination with fish oil.

High blood pressure: Garlic tablets 300-24000mg daily have been cited in the literature.

Prostate cancer: Liquid garlic extract 1mg/kg body weight daily has been used.

More research is currently needed for dosing garlic for potential immune benefits at this time.

Practical Uses: In supplemental form for specific conditions listed above, and for utilization in foods as a flavor enhancer.

Summary and Recommendations: There is good research to support using garlic to help prevent and treat high blood pressure, diabetes, clogging of the arteries, elevated cholesterol, and certain types of cancer. There is research to suggest that certain components in garlic – such as

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its allicin content – have positive effects on immune function, and that garlic may overall support immune function. At this time more research is currently needed in humans to rate garlics effectiveness when it comes to promoting immune function.

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Onion Juice

What is it used for: Commonly used as a food and for potential medicinal purposes including:²⁹

- Preventing atherosclerosis
- Treating dyspepsia
- Fever
- Colds
- Cough
- Bronchitis
- Hypertension
- Infections
- Oral cavity inflammation
- Asthma
- Whooping cough
- Preventing cancer
- Diabetes
- Insomnia

Effectiveness: There is limited research in humans currently to determine effectiveness of onions for immune-enhancing effects. Onions have di- and tri-sulfide compounds and flavonoids including quercetin (found in red onions). Plant sterols are found in onions which have been associated with helping to lower cholesterol levels. Organosulfur compounds in onions along with quercetin may help to prevent cancer. Quercetin has been found to stimulate immune cells in animal research.¹ Onion has antibacterial and antifungal properties in vitro.¹

Safety: Safe when used in amounts commonly found in foods.²⁹

Adverse effects: Side effects or adverse effects are uncommon when taken orally. Large quantities may cause stomach upset including heartburn.²⁹

Dose: More research is needed at this time on specific dosages for onion juice and immunity.

Practical Uses: Culinary food and condiment.

Summary and Recommendations: Onions have di- and tri-sulfide compounds, plant sterols, and flavonoids that may provide health benefits. Red onions are high in the flavonoid quercetin. These compounds are likely responsible for onions association with reduced cancer risk. Furthermore, onions have been shown to have antibacterial and antifungal properties in vitro.

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Habanero liquid alcohol extract

What is it: An extract of a type of chili pepper.

What it does: It has significant amounts of antioxidants.²⁹ It's antioxidant content has been attributed to the phytochemicals it contains including carotenoids, vitamins, phenolic compounds, and capsaicinoids.³⁰ The effectiveness of habanero liquid alcohol extract for promoting immune function is currently unknown at this time; more research is needed in this area.

Safety: No known safety concerns currently.

Adverse effects: No known adverse effects from habanero liquid alcohol extract currently.

Dosing: No known dose currently to support immune function. More research is needed.

Summary and Recommendations: Habanero peppers contain a significant amount of antioxidants. Antioxidants are known to support immune function by scavenging free radicals and preventing disease and illness. At this time more research is needed in this area.

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