



Apple Cider Vinegar: Panacea or Myth?

By Zachary A. Knecht, PhD

The health benefits of consuming apple cider vinegar have received a lot of attention over the last decade. Depending on whom you ask, this apparently innocuous kitchen staple either is a tasty addition to salad dressing or has powers ranging from helping weight loss to preventing cancer and curing diabetes. So does apple cider vinegar really represent “one simple trick” to promote better health? The truth is more complicated than reported in most health blogs.

Like wine, vinegar (from the French *vin aigre*, meaning “sour wine”) is made by fermenting a source of carbohydrates, such as grains, honey, and fruit. It contains water

and acetic acid, a byproduct of this fermentation that provides vinegar's sharp flavor, smell, acidity, and small amounts of amino acids, minerals, and other organic acids. With a pH of 2-3, vinegar's high acidity is behind many of its purported antimicrobial properties. This acidity makes apple cider vinegar effective as an antiseptic agent for food preparation and cleaning; however, it is not recommended for treating wounds, because the concentrations needed to inhibit the growth of bacteria, viruses, and fungi would harm our own cells, cause pain, and possibly result in chemical burns. Although application of apple cider vinegar is said to be helpful for treating lice infestation, it actually is less effective than are other home remedies (eg, mayonnaise, petroleum jelly).³ Overall, commercially available cleaners, antibacterial products, and lice treatments are better choices for these needs.

Can apple cider vinegar help weight loss and diabetes management? Evidence exists that it actually can have an impact on these conditions. Until recently, most claims that apple cider vinegar can help maintain blood sugar and promote weight loss were based on studies in mice and rats.⁴ However, although laboratory results found in rodents can reflect how a substance would affect humans, differences in metabolic and nutritional requirements raise many questions about whether a substance that benefits rodents would help humans. In a randomized clinical trial published in 2018, Khezri and others discussed how use of an apple cider vinegar dietary supplement affected weight loss in overweight and obese humans. The researchers found that consuming apple cider vinegar decreased body weight, body mass index, and even appetite. However, participants in this study were fed a highly controlled, restricted-calorie diet along with doses of apple cider vinegar. So although taking apple cider vinegar may be useful in controlling weight, it certainly does not substitute for good eating habits and exercise.

Apple cider vinegar may also reduce blood glucose levels by improving insulin sensitivity. In one study from 2007, White and Johnston reported that swallowing two tablespoons of apple cider vinegar before bedtime reduced fasting blood sugar levels by

4%. This finding may also explain how using apple cider vinegar helps weight loss—it reduces insulin levels and helps individuals to feel full and consume fewer calories.

Even though the health benefits of apple cider vinegar are not a myth, this substance also does not represent a cure-all. Researchers continue to delve into its possible uses, and many more health benefits may be reported in the future. However, the biological mechanisms that underlie these positive health effects are still not completely understood, and anyone who decides to use apple cider vinegar to improve their health should be very cautious. Even the most promising medical reports present apple cider vinegar not as a miracle cure but as a helpful supplement that may moderately improve efforts to control obesity in people who also watch what they eat and exercise. Most importantly, since use of vinegar can pose dangers because of its acidity, and because various types of vinegar contain different compounds and may not be suitable for a particular use, it would be wise to consult with a physician before moving that bottle of apple cider vinegar from your pantry to your medicine cabinet.

References

- Entani E, Asia M, Tsujihata S, Tsukamoto Y, Otha M. Antibacterial action of vinegar against food born pathogenic bacteria Including *Escherichia coli* 0157 H7. *J Food Prot.* 1998;6:953-959.
- Johnston CS, Gaas CA. Vinegar: medicinal uses and antiglycemic effect. *MedGenMed.* 2006;8:61.
- Johnston CS, Kim CM, Butler AH. Vinegar Improves Insulin sensitivity with insulin resistance or type 2 diabetes. *Diabetes Care.* 2004;27:281-282.
- Khezri SS, Saidpour A, Hosseinzadeh N, Amiri Z. Beneficial effects of apple cider vinegar on weight management, visceral adiposity index and lipid profile in overweight or obese subjects receiving restricted calorie diet: a randomized clinical trial. *J Funct Foods.* 2018;43: 95–102.
- Korkmaz A, Şahiner Ü, Yurdakök M. Chemical burn caused by topical vinegar application in a newborn infant. *Pediatr Dermatol.* 2000;17:34–36.
- Ostman E, Ganfelat Y, Persson L, Bjorck I. Vinegar supplementation lowers glucose and insulin responses and increases satiety after a bread meal in healthy subjects. *Eur J Clin Nutr.* 2005;59:983-988.
- Samad A, Azlan A, Ismail A. Therapeutic effects of vinegar: a review. *Curr Opin Food Sci.* 2016;8:56–61.

Takano-Lee M, Edman JD, Mullens BA, Clark JM. Home remedies to control head lice: assessment of home remedies to control the human head louse, *Pediculus humanus capitis* (Anoplura: Pediculidae). *J Pediatr Nurs*. 2004;19:393–398.

White AM, Johnston CS. Vinegar ingestion at bedtime moderates waking glucose concentrations in adults with well controlled type 2 diabetes. *Diabetes Care*. 2007;30:2814-2815.

Dr. Knecht earned his PhD in Neurobiology at Brandeis University and is currently working at the Massachusetts Institute of Technology in Boston. His current research topics include nerve regeneration. His other current interests include fitness, hiking, and nutrition.