

## Research shows pears could be part of a healthy diet to manage diabetes

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Dipayan Sarkar, now at North Dakota State University, Fargo, previously at the University of Massachusetts with co-authors Kalidas Shetty, Chandrakant Ankolekar and Marcia Pinto, found that in vitro (test tube) lab experiments provided metabolic insights into how two varieties of pears could play a role to better manage early stage diabetes and associated hypertension. More research would be needed to determine if the results of the in vitro studies can be replicated in humans.

While the phrase "an apple a day" is a popular saying, a new study suggests that pears as part of a healthy diet could play a role in helping to manage type 2 diabetes and diabetes-induced hypertension.

The results of research published in Food Research International show

potential health benefits of Bartlett and Starkrimson pears. Building on their previous studies, the research team from North Dakota State University, Fargo, and the University of Massachusetts studied whether the peel, pulp and juice of pears could impact the prevention and management of type 2 diabetes, hypertension and the bacteria *Helicobacter pylori*, which plays a role in intestinal ulcers.

The research team includes: Kalidas Shetty and Dipayan Sarkar, now at North Dakota State University, Fargo, previously at the University of Massachusetts with co-authors Chandrakant Ankolekar and Marcia Pinto. Shetty, professor of Plant Sciences at NDSU, serves as the director of the Global Institute of Food Security and International Agriculture (GIFSIA), as well as associate vice president for International Partnerships and Collaborations.

The in vitro (test tube) lab experiments by researchers in the study provided metabolic insights into how two varieties of pears could play a role to better manage early stage diabetes and associated hypertension, commonly called high [blood pressure](#). More research would be needed to determine if the results of the in vitro studies can be replicated in humans.

Naturally occurring phenolic compounds found in fruits may provide a variety of health benefits, as this study shows. More varied and higher phenolic content is found in the skin of the pear than in its flesh or pulp. The study showed that Starkrimson peel had the highest total phenolic content, and that peel extracts had significantly higher total phenolic content than pulp. The pulp extracts of the Bartlett cultivar had higher total phenolics when compared with Starkrimson.

"Our results from in vitro assays suggest that if we consume Bartlett and Starkrimson pears as a whole fruit (peel and pulp) it may potentially provide better control of early stage diabetes as part of an overall

healthier diet," said Shetty.

"Such dietary strategy involving fruits, including pears, not only potentially could help better control blood glucose levels, but also reduce over dependence on drugs for prediabetes stages, or complement a reduced pharmacological dose of drugs with side effects to combat very early stages of type 2 diabetes," said the study authors in their article.

World Health Organization [statistics](#) show that diabetes affects approximately 387 million adults worldwide, with the number expected to jump to 592 million by 2035. Some references consider [type 2 diabetes](#) a rapidly emerging epidemic in children due to unhealthy diets.

## Effects on blood pressure

Researchers also examined whether the pears studied might provide benefits to controlling [high blood pressure](#). ACE (angiotensin-I-converting enzyme) inhibitors are medications that are sometimes used to help treat elevated blood pressure. The study showed that the watery extract of Bartlett pulp had low to moderate ACE inhibitory activity. The pear peel and pulp did not show any ACE inhibitory activity in this study.

"Our results suggested that Bartlett pulp could be utilized as a potential mild ACE inhibitor following further evaluation with different concentrations and extraction processes," said the study authors.

## Pears and gut bacteria

Researchers also studied whether fermented whole pear juice of Bartlett and Starkrimson pear extracts could inhibit the bacteria *H. pylori*. This bacteria found in the gut often is associated with gastritis and stomach

ulcers. No pH adjusted samples after fermentation inhibited *H. pylori*. Starkrimson pear without pH adjustment inhibited *H. pylori* after 24, 48 and 72 hours of fermentation. Fermented samples of Bartlett pear inhibited *H. pylori* only after 48 and 72 hours, when pH was adjusted before fermentation.

Results suggest that fermented pear extract can inhibit *H. pylori* without affecting the growth or function of probiotic bacteria and has the potential to sustain probiotic function of beneficial bacteria.

More studies are needed, said Shetty, to further investigate the bioactive compounds in the peel and pulp of these pear varieties. Study of other properties such as fiber content, amino acids, and vitamin C could provide additional insight on the role of pears in a healthy food system.

## **Results show opportunity for agriculture**

Shetty said results of this study and others point to the use of foods that can help combat disease, which in turn, can impact agriculture around the world. "This research helps make the case to build better 'food crops for health,'" he said. He sees additional opportunity for agriculture, particularly in North Dakota. "We now can develop a wide diversity of crops in North Dakota that not only meet global food security and nutritional security, but also are wholesome to counter chronic diseases from poor diets," he said. More information will be available at a Food for Health conference to be held in Fargo on July 5-8.

Currently, NDSU students in Shetty's research group are working not only on pear research, but also on a range of crops grown in North Dakota, including beans, squash, and cereal grains.

Results of this study suggest that eating Bartlett and Starkrimson pears as whole, fresh harvested fruits can provide higher [health benefits](#), due to

their phenolic-linked high antioxidant activities.

So when you reach for that apple a day, maybe grab a [pear](#) too. Just remember to eat the peel.

**More information:** "Dietary functional benefits of Bartlett and Starkrimson pears for potential management of hyperglycemia, hypertension and ulcer bacteria *Helicobacter pylori* while supporting beneficial probiotic bacterial response," *Food Research International*, Volume 69, March 2015, Pages 80-90, ISSN 0963-9969, [dx.doi.org/10.1016/j.foodres.2014.12.014](https://doi.org/10.1016/j.foodres.2014.12.014)

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