

Wine's red grape pulp offers nutritional bounty

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When making red wine, the leftover pulp from grapes can be a nutritious powerhouse—possibly reducing risk from illness such as cardiovascular disease and diabetes. Credit: Noël Heaney / Cornell University

Pomace—the mashed, leftover pulp from red grapes in the early process of making wine—is considered byproduct rubbish. But maybe not for long. In a new Cornell University-led food science study, researchers now demonstrate how viticultural trash could be a nutritive treasure.

The group showed that two stilbenes—beneficial molecular compounds found in plants—can affect human intestines and the stomach's microbiome in a healthy way. While this still needs further research, the finding may play a role in reducing the risks from cardiovascular disease and diabetes, according to their work published in the journal *Nutrients*.

"This byproduct of making wine has important potential," said Elad Tako, associate professor of food science in the College of Agriculture and Life Sciences. "If we can use the pomace to either extract key compounds or use them as a dietary ingredient to fold into food, then [grape](#) pomace can be a very sustainable source of nutritional compounds with demonstrated health benefits."

Tako said the research provides understanding on how stilbenes work at the human gut level.

Additionally, in the study, the Tako research group screened red grape varieties typically found in the Finger Lakes Region of New York, where a robust winery economy exists. The team used *Vitis vinifera* (wine grapes), *Vitis labruscana* (Concord grapes) and an interspecific hybrid to associate the findings with practical dietary health benefits of grape and grape product consumption, Tako said.

"I've been working with polyphenols (plant-based nutritional compounds), and I was intrigued by previous research that suggested that bioactive compounds—such as resveratrol in red [wine](#)—has cardiovascular and other health benefits," Tako said. "The mechanism of how these [compounds](#) work in the body was not clear, so I used my in vivo model to find the answer."

By using a chicken (*Gallus gallus*) as in vivo model, the scientists were able to determine the nutritional benefits of the stilbenes, resveratrol and pterostilbene.

The embryonic phase (the fertile egg) of *Gallus gallus* lasts for 21 days, which is when the embryo is surrounded by amniotic fluid (egg whites), naturally and orally consumed by the embryo prior to hatch on day 21.

In the experiment, the stilbenes extract was injected into the eggs' amniotic fluid, consisting mostly of water and peptides, on day 17 of embryonic development. The [amniotic fluid](#) and the added nutritional solution were then consumed by the embryo by day 19 of incubation—a method developed by Tako called "intra amniotic administration."

In this way, the group learned how the resveratrol and the pterostilbene affects the gastrointestinal tract, as well as other physiological systems and tissues, Tako said. The group confirmed positive, nutritional effects on the intestinal microbiome and small intestine.

More information: Mariana Juste Contin Gomes et al, Modifications in the Intestinal Functionality, Morphology and Microbiome Following Intra-Amniotic Administration (*Gallus gallus*) of Grape (*Vitis vinifera*) Stilbenes (Resveratrol and Pterostilbene), *Nutrients* (2021). [DOI: 10.3390/nu13093247](#)

Provided by Cornell University

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