

Benefit of grapes may be more than skin deep

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Can a grape-enriched diet prevent the downhill sequence of heart failure after years of high blood pressure?

A University of Michigan Cardiovascular Center study suggests grapes may prevent heart health risks beyond the simple blood pressure-lowering impact that can come from a diet rich in fruits and vegetables. The benefits may be the result of the phytochemicals - naturally occurring antioxidants - turning on a protective process in the genes that reduces damage to the heart muscle.

The study, performed in laboratory rats, was presented at the 2009 [Experimental Biology](#) convention in New Orleans.

The researchers studied the effect of regular table grapes (a blend of green, red, and black grapes) that were mixed into the rat diet in a powdered form, as part of either a high- or low-salt diet. Comparisons were made between rats consuming the [grape](#) powder and rats that received a mild dose of a common blood pressure drug. All the rats were from a research breed that develops [high blood pressure](#) when fed a salty diet.

After 18 weeks, the rats that received the grape-enriched diet powder had lower blood pressure, better [heart function](#), and fewer signs of heart muscle damage than the rats that ate the same salty diet but didn't receive grapes.

Rats that received the blood pressure medicine, hydrazine, along with a

salty diet also had lower blood pressure, but their hearts were not protected from damage as they were in the grape-fed group.

"There are the small changes that diet can bring, but the effect of grape intake on genes can have a greater impact on disease down the road," said E. Mitchell Seymour, M.S., who led the research as part of his doctoral work in nutrition science at Michigan State University. He manages the U-M Cardioprotection Research Laboratory, which is headed by U-M cardiac surgeon Steven Bolling, M.D.

[Heart cells](#), like other cells in the body, make an antioxidant protein called glutathione, which is one of our first defenders against damaging oxidative stress. High blood pressure causes oxidative stress in the heart and lowers the amount of protective glutathione. However, intake of grapes actually turned on glutathione-regulating genes in the heart and significantly elevated glutathione levels.

This may explain why the hearts of grape-fed animals functioned better and had less damage.

Although the current study was supported in part by the California Table Grape Commission, which also supplied the grape powder, the authors note that the commission played no role in the study's design, conduct, analysis or the preparation of the journal article for publication.

Seymour also receives funding from the National Heart, Lung and Blood Institute, part of the National Institutes of Health, through a National Research Service Award.

Bolling said the latest results take research on the health benefits of grapes "a step further" by examining the mechanisms impacted by antioxidant-rich grapes.

The rats in the study were from a strain called Dahl rats, which have

been specially bred to all be susceptible to salt-induced hypertension. The animals are similar to

Americans who have elevated blood pressure related to diet, and who develop [heart](#) failure over time because of prolonged hypertension.

Each group of 12 rats was fed the same weight of food each day with powdered grapes making up 3 percent of the diet (by weight) for rats that received grapes as part of either a low-salt or high-salt diet. The rats that received hydrazine were fed it through their water supply in a dose that has been previously shown to be effective in reducing [blood pressure](#).

Such naturally occurring chemicals have already been shown in other research, including previous U-M studies, to reduce other potentially harmful molecular and cellular activity in the body.

In all, the researchers say, the study further demonstrates that a grape-enriched [diet](#) can have broad effects on the development of hypertension and the risk factors that go with it. Whether the effect can be replicated in humans, they say, remains to be seen.

Source: University of Michigan Health System ([news](#) : [web](#))

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