

Beetroot juice may provide benefits to heart disease patients

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A new study finds that dietary nitrate—a compound that dilates blood vessels to decrease blood pressure—may reduce overstimulation of the sympathetic nervous system that occurs with heart disease. The research team looked specifically at beetroot juice, a source of dietary nitrate, to explore its use as a future targeted treatment option for people with cardiovascular disease. The study, published ahead of print in the *American Journal of Physiology—Heart and Circulatory Physiology*, is the first to study the effects of nitrate supplementation on sympathetic nerve activity.

Activation of the sympathetic nervous system—caused by increased [sympathetic nerve activity](#)—results in elevated heart rate and [blood pressure](#) and blood vessel constriction. Sympathetic nerve activity (sympathetic outflow) also increases with some forms of cardiovascular disease, including high blood pressure and heart failure. The aim of the study was to show that "acute nitrate supplementation using [beetroot juice](#) can decrease muscle sympathetic outflow at rest and during exercise," the Canadian research team wrote.

Twenty young adult volunteers (average age: 27) participated in two separate testing visits in which they blindly received either a nitrate supplement or a placebo. On both visits, the research team recorded the blood pressure, heart rate and muscle sympathetic nerve activity (MSNA) and measured muscle activity at rest and during handgrip exercise with the participants' non-dominant hand. Measurements were recorded at the beginning of the visit and then again after the volunteers drank nitrate-rich beetroot juice or a placebo and had rested on their backs for three hours.

MSNA burst rate, denoting the frequency of nerve activity, was lower when the volunteers drank beetroot juice compared to when they drank the placebo. Sympathetic nerve [activity](#) also

decreased during exercise. "Surprisingly, no differences in [blood pressure](#) were detected at rest or during exercise," the research team noted. "These results provide proof-of-concept that dietary nitrate supplementation can modulate central sympathetic outflow and suggest that the established cardiovascular benefits [of dietary nitrate] are likely to involve a neural contribution."

More information: Karambir Notay et al. Acute beetroot juice supplementation on sympathetic nerve activity: A randomized, double-blind, placebo-controlled proof-of-concept study, *American Journal of Physiology - Heart and Circulatory Physiology* (2017). [DOI: 10.1152/ajpheart.00163.2017](https://doi.org/10.1152/ajpheart.00163.2017)

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