

## With beetroot juice before exercise, aging brains look 'younger': study

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Wake Forest Health and Exercise Science professor Jack Rejeski and physics professor Dany Kim-Shapiro are researching the health effects of beet juice, seen here in the new Health and Exercise Science lab. Credit: WFU/Ken Bennett

Drinking a beetroot juice supplement before working out makes the brain of older adults perform more efficiently, mirroring the operations of a younger brain, according to a new study by scientists at Wake Forest

University.

"We knew, going in, that a number of studies had shown that [exercise](#) has positive effects on the brain," said W. Jack Rejeski, study co-author. "But what we showed in this brief training study of hypertensive [older adults](#) was that, as compared to exercise alone, adding a beet root [juice](#) supplement to exercise resulted in brain connectivity that closely resembles what you see in younger adults."

While continued work in this area is needed to replicate and extend these exciting findings, they do suggest that what we eat as we age could be critically important to the maintenance of our brain health and functional independence.

Rejeski is Thurman D. Kitchin Professor and Director of the Behavioral Medicine Laboratory in the Department of Health & Exercise Science. The study, "Beet Root Juice: An Ergogenic Aid for Exercise and the Aging Brain," was published in the peer-reviewed *Journals of Gerontology: Medical Sciences*. One of his former undergraduate students, Meredith Petrie, was the lead author on the paper.



Wake Forest physics professor Dany Kim-Shapiro talks about his research on the health effects of beet juice. Credit: WFU/Ken Bennett

This is the first experiment to test the combined effects of exercise and beetroot juice on functional brain networks in the [motor cortex](#) and secondary connections between the motor cortex and the insula, which support mobility, Rejeski said.

The study included 26 men and women age 55 and older who did not exercise, had high blood pressure, and took no more than two medications for [high blood pressure](#). Three times a week for six weeks, they drank a beetroot juice supplement called Beet-It Sport Shot one hour before a moderately intense, 50-minute walk on a treadmill. Half the participants received Beet-It containing 560 mg of nitrate; the others received a placebo Beet-It with very little nitrate.

Beets contain a high level of dietary nitrate, which is converted to nitrite and then nitric oxide (NO) when consumed. NO increases blood flow in the body, and multiple studies have shown it can improve exercise performance in people of various ages.



Wake Forest Health and Exercise Science professor Jack Rejeski talks about his research on the health effects of beet juice. Credit: WFU/Ken Bennett

"Nitric oxide is a really powerful molecule. It goes to the areas of the body which are hypoxic, or needing oxygen, and the brain is a heavy feeder of oxygen in your body," said Rejeski.

When you exercise, the brain's somatomotor cortex, which processes information from the muscles, sorts out the cues coming in from the

body. Exercise should strengthen the somatomotor cortex.

So, combining beetroot juice with exercise delivers even more oxygen to the [brain](#) and creates an excellent environment for strengthening the somatomotor cortex. Post-exercise analysis showed that, although the study groups has similar levels of nitrate and nitrite in the blood before drinking the juice, the [beetroot juice](#) group had much higher levels of nitrate and nitrite than the placebo group after exercise.

**More information:** Meredith Petrie et al, Beet Root Juice: An Ergogenic Aid for Exercise and the Aging Brain, *The Journals of Gerontology Series A: Biological Sciences and Medical Sciences* (2016). [DOI: 10.1093/gerona/glw219](https://doi.org/10.1093/gerona/glw219)

Provided by Wake Forest University

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