

Researchers study whether high-potassium diets protect blood vessel function in salt-resistant adults

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CHS Kinesiology and Applied Physiology faculty member Shannon Lennon (right) is researching whether a diet high in potassium also has a protective effect on blood vessel function in salt-resistant adults. Registered dietitian Kristina Davis (left) creates the meals used in the study, with help from undergraduates, including sophomore Antoinette Portnoy. Credit: University of Delaware

Dietary guidelines recommend that Americans consume less than 2,300 milligrams of sodium a day in their diet—about a teaspoon's worth. The reality is that most people in the United States are eating far more sodium than that—an average of 3,400 milligrams a day—and putting themselves at risk of developing cardiovascular diseases like high blood pressure and heart disease.

Increasing [potassium intake](#) has been credited with reducing [blood pressure](#) and lowering the risk of cardiovascular diseases. Bananas are well-known as a source of potassium, but the mineral also can be found in leafy greens, root vegetables like potatoes and carrots, [citrus fruits](#) and fruit that comes from a vine, like grapes.

Shannon Lennon, an associate professor in the Department of Kinesiology and Applied Physiology at the University of Delaware, is researching whether a diet high in potassium also has a protective effect on [blood](#) vessel function in salt-resistant adults. People with salt resistance do not experience an increase in blood pressure after eating a high-salt meal.

Their response to sodium matters because most adults are salt-resistant when they are young and middle-aged but they develop [high blood pressure](#) later in life.

Last year, Lennon, who studies the role of nutrition in cardiovascular disease, received a \$2.8 million grant from the National Institutes of Health to learn more about the mechanisms underlying these protective effects from dietary potassium. Previous research showed that sodium has a harmful effect on blood vessel function independent of blood pressure, but it is unknown if potassium has a protective effect.



After study subjects finish their 10-day controlled feeding studies, they visit the Cardiovascular Nutrition Research Lab, where research technician Alexis Mbakwe and others look to see how their bodies respond to the different diets. Credit: University of Delaware

As part of her research, Lennon and her team in the Cardiovascular Nutrition Research Laboratory are comparing three 10-day diets made with varying levels of potassium and sodium. They hope to see if potassium can counteract sodium's effects by improving blood vessel function and reducing oxidative stress and stiffness in the [endothelial cells](#) that line the interior of blood vessels. Dysfunction in these endothelial cells—such as impaired dilation—is a non-traditional risk factor for atherosclerosis, the hardening and narrowing of artery walls caused by build-up of fat and plaque.

To do that, Lennon's team is recruiting study participants to take part in a controlled feeding study that features varying amounts of potassium and sodium. Two of the diets are high in sodium with varying levels of potassium. A third is lower in both sodium and potassium.

Each meal is developed by registered dietitian Kristina Davis, who tweaks the menu to meet the sodium and potassium requirements and also to adjust for subject preferences. Undergraduate students help by assisting with the prep work in the kitchen by weighing foods and other ingredients.

On the last day of each 10-day diet, participants undergo vascular and blood pressure testing to see how their bodies respond to the different diets.

Lennon said high-sodium diets can impact the ability of blood vessels to dilate. Over time, that can lead to stiffening. The goal is to determine if the high potassium diet reduces the effects of the high [sodium](#).

"We are recommended to consume less salt, but it's very challenging because it's in a lot of the foods we eat," Lennon said. "We should continue to recommend that, but high [potassium](#) may be the way to go to offset the negative effects of all that salt."

Provided by University of Delaware

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