

Building a better salt substitute: New formula helps reduce high blood pressure

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Let's face it: Americans eat too much salt. The popular seasoning, also known as sodium chloride, is found in many food favorites, including pizza, chips, burgers, and breads. On average, people consume more than

3,400 milligrams of sodium chloride daily, or roughly over a tablespoon a day, much higher than the under 2,300 milligrams experts recommend.

The problem is that excess sodium intake increases [blood pressure](#), which is associated with a higher risk of heart disease, stroke, and death. To cut down on sodium and improve cardiovascular health, a growing number of people are turning to healthier alternatives and improved dietary routines.

Some [salt](#) substitutes tend to have a bitter or metallic aftertaste, limiting their use. And while some salt substitutes lower blood pressure, [scientific evidence](#) for their efficacy at the [population level](#) has been inconclusive.

But what if someone came up with a salt substitute that tasted just like regular salt, yet had proven blood pressure-lowering qualities? In 2015, researchers supported by the National Heart, Lung, and Blood Institute (NHLBI) published a [paper](#) about just such a development. Their new salt formulation contained 75% [sodium chloride](#) and 25% [potassium chloride](#). The mineral potassium, a common ingredient in several salt substitutes and naturally found in many fruits and vegetables, is known to relax the walls of the arteries and lower blood pressure.

In 2020, Jaime Miranda, M.D., Ph.D., then director of CRONICAS Center of Excellence at the Cayetano Heredia Peruvian University, Lima, and colleagues conducted a community-wide [study](#) to replace conventional table salt with their newly developed salt substitute, with the goal of lowering blood pressure in the general population.

Community-wide study

The researchers tested their new salt formulation among 2,376 people living in six villages in the Tumbes region of Peru, which has one of the highest rates of hypertension in the country. Many in the villages have

low incomes and little or no access to antihypertensive drugs.

The participants—men and women—ranged in age from 18 years to over 65 years, with an average age of 43 years. About half the participants were women. They were followed from about 2014 to 2017 to evaluate the effect of the salt substitute on their blood pressure compared to regular salt use. This was achieved through a randomized study design in which some participants began receiving the salt substitute while others continued to use regular salt. Over time, all the participants eventually received the salt substitute.

At the end of the roughly three-and-a-half-year study period, researchers said new cases of hypertension fell by half in this population that used the new salt. The average blood pressure levels of the participants also decreased during the study. The researchers said they did not see any severe adverse side effects from the intervention.

"Our study is one of the first to show the feasibility of implementing a practical, population-wide, salt-substitution strategy for reducing blood pressure and the incidence of hypertension in both young and old persons," said Miranda, currently a professor and head of the School of Public Health at the University of Sydney in Australia. "That makes it a potential game changer in the fight against hypertension."

Study participants with hypertension at the start of the study experienced a decrease of systolic pressure—the top number in a blood pressure reading—of 1.92 millimeters of mercury (mm Hg). In those without hypertension at the start of the study, the average reduction in systolic pressure was 1.18 mm Hg. Participants aged 60 years and over who had hypertension saw an even greater blood pressure reduction—of 2.17 mm Hg.

Although these decreases were modest, even a 2 mm Hg drop in blood

pressure could lead to about a 10% lower risk of death from stroke and about a 7% lower risk of death from heart disease, Miranda said. He cited a recent scientific analysis of observational studies of blood pressure and vascular disease in adults.

"This is a great example of using food as medicine," Miranda said. "And one of the best parts is that you can make this salt substitute at home." He added that he would like to see the salt substitute more widely adapted, including by the food industry. "It could have an enormously beneficial impact on individuals, the community, and the health care system," Miranda said. "That's because it not only cuts down on salt in those with hypertension but helps prevent new cases."

Promising future

George Mensah, M.D., director of NHLBI's Center for Translation Research & Implementation Science, welcomed Miranda's findings.

"This study shows the importance of community-wide interventions for heart health," Mensah said. "It takes a population approach, rather than a focus on individual high-risk persons, to reduce risk in whole communities or villages. While this salt substitute is promising, it is not a panacea, and it should be used together with the other recommendations for heart-healthy living such as increasing fruit and vegetable intake and physical activity."

Alison Brown, Ph.D., a program director in the Prevention and Population Science Program in the NHLBI's Division of Cardiovascular Sciences and a registered dietitian, agreed that the new salt substitute appears promising.

"There's an imbalance between sodium and potassium intake in the U.S. diet, with Americans consuming far too much sodium," Brown said. "We need to cut back on sodium and increase potassium in our diet by eating

more fruits and vegetables, because potassium has been shown to [lower blood pressure](#). While eating more potassium-rich fruits and vegetables is most ideal, this salt substitute is yet another way to address this imbalance."

Miranda cautioned, however, that salt substitutes can also pose a health risk in certain people. Those with [chronic kidney disease](#), for example, may have trouble processing potassium, which is why people with kidney disease were not included in the study. So before switching to any type of [salt substitute](#), check with your health care provider, he said.

And also try other ways to prevent and manage high blood pressure, such as maintaining ideal body weight, avoiding excess alcohol, and engaging in physical activity on most days of the week. According to Brown, one of the best is by following the [Dietary Approaches to Stop Hypertension \(DASH\)](#) eating plan, which promotes eating fruit, vegetables, whole grains, low-fat dairy and lean meats, while limiting saturated fats, sugar sweetened beverages and sweets, and foods that are high in sodium.

The [DASH plan](#), developed decades ago, is scientifically proven to reduce blood pressure.

Provided by NIH/National Heart, Lung and Blood Institute

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