

Eating fruits and vegetables linked to healthier arteries later in life

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Women who ate a diet high in fresh fruits and vegetables as young adults were much less likely to have plaque build-up in their arteries 20 years later compared with those who consumed lower amounts of these foods, according to research to be presented at the American College of Cardiology's 63rd Annual Scientific Session. This new finding reinforces the importance of developing healthy eating habits early in life.

Previous studies have found that middle-aged adults whose diet consists of a high proportion of [fruits and vegetables](#) are less likely to have a heart attack or stroke, but the relationship between [fruit](#) and vegetable consumption during young adulthood and [heart disease](#) later in life was less clear. To study this concept, researchers evaluated the association between dietary intake of fruits and vegetables in [young adults](#) and the presence of [coronary artery](#) calcification (CAC) 20 years later. CAC scores, which were obtained using a CT scan, provide a direct estimate of the amount of plaque in the coronary arteries.

"It's an important question because lifestyle behaviors, such as a heart healthy diet, are the foundation of cardiovascular prevention and we need to know what dietary components are most important," said Michael D. Miedema, M.D., M.P.H., a cardiologist at the Minneapolis Heart Institute, and the lead investigator of the study.

Specifically, women who reported consuming the most fruits and vegetables (eight to nine servings a day for a 2,000-calorie diet) in their 20s were 40 percent less likely to have calcified plaque in their arteries

in their 40s compared with those who ate the least amount (three to four servings a day) during the same time period. This association persisted even after researchers accounted for other [lifestyle behaviors](#), as well as for their current-day diets, further demonstrating the role dietary patterns at younger ages may play.

"These findings confirm the concept that plaque development is a lifelong process, and that process can be slowed down with a healthy diet at a young age," Miedema said. "This is often when dietary habits are established, so there is value in knowing how the choices we make in early life have lifelong benefits."

Surprisingly, the same benefit did not hold true for men, which warrants further investigation.

"Several other studies have also suggested that a diet high in fruits and vegetables is less protective in men, but we do not have a good biological reason for this lack of association," Miedema said, adding that the study had less power to evaluate men (62.7 percent were female vs. 37.3 percent male).

The study included 2,508 participants from the ongoing government-sponsored Coronary Artery Risk Development in Young Adults (CARDIA) study, which is evaluating how heart disease develops throughout adulthood. CARDIA began in the mid-1980s with a group of men and women 18-30 years of age and has collected extensive data on medical, socioeconomic, psychosocial and behavioral characteristics.

At the start of CARDIA (1985-1986), women and men were asked about their consumption of different fruits and vegetables and the number of servings they had eaten in the past month using a semi-quantitative interview food-frequency questionnaire. Researchers then calculated the average number of servings of fruits and vegetables per day and adjusted

them to a 2,000-calorie diet. People were divided into three groups based on self-reported fruit and vegetable intake: high, moderate and low. CAC was measured at year 20 (2005-2006) using electron-beam computed tomography. The average age at baseline and the 20-year follow-up was 25 and 45 years, respectively.

"CAC scoring is currently the best predictor we have for future heart attacks," Miedema said. Calcium build-up in the walls of the coronary arteries is an early sign of heart disease, and the presence of CAC substantially raises an individual's risk for a future [heart attack](#).

In their analysis, researchers controlled for smoking, exercise, consumption of red meat, sugar-sweetened beverages and other dietary and cardiovascular risk factors that correlate with atherosclerosis. Participants with extreme high or low caloric intake/day or those missing CAC scores were excluded from the analysis.

The current findings are in line with the 2011 U.S. Department of Agriculture Dietary Guidelines that advise Americans to fill half of their plates with colorful fruits and vegetables at each meal or snack. Based on these recommendations, adults who consume a 2,000-calorie a day diet should be consuming 2.5 cups of vegetables and two cups of fruit a day – a big jump from what the average American usually gets from their diet, according to government figures.

Fruits and vegetables are packed with vitamins, minerals, fiber, antioxidants and other things that are known to promote good health. Plant-based diets in general have also been linked to greater longevity, less cancer, lower cholesterol, lower blood pressure and healthier body weight.

Miedema emphasized that more studies are needed to further define the relationship between fruits, vegetables and cardiovascular disease in men

and women, in addition to determining the best ways to increase compliance with a diet high in fruits and [vegetables](#) in the U.S. population.

Provided by American College of Cardiology

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