MedicalXpress

Twin research indicates that a vegan diet improves cardiovascular health

November 30 2023

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In a study with 22 pairs of identical twins, Stanford Medicine researchers and their colleagues have found that a vegan diet improves cardiovascular health in as little as eight weeks.

Although it's well-known that eating less meat improves cardiovascular health, diet studies are often hampered by factors such as genetic differences, upbringing and lifestyle choices. By studying identical twins, however, the researchers were able to control for genetics and limit the other factors, as the twins grew up in the same households and reported similar lifestyles.

"Not only did this study provide a groundbreaking way to assert that a vegan diet is healthier than the conventional omnivore diet, but the twins were also a riot to work with," said Christopher Gardner, Ph.D., the Rehnborg Farquhar Professor and a professor of medicine. "They dressed the same, they talked the same and they had a banter between them that you could have only if you spent an inordinate amount of time together."

The study was published in *JAMA Network Open*. Gardner is the senior author. The study was co-first authored by Matthew Landry, Ph.D., a former Stanford Prevention Research Center postdoctoral scholar, now at the University of California, Irvine, and Catherine Ward, Ph.D., a post-doctoral scholar at the center.

Twin participants

The trial, conducted from May to July 2022, consisted of 22 pairs of identical twins for a total of 44 participants. The study authors selected healthy participants without cardiovascular disease from the Stanford Twin Registry—a database of fraternal and identical twins who have agreed to participate in research studies—and matched one twin from each pair with either a vegan or omnivore diet.

Both diets were healthy, replete with vegetables, legumes, fruits and whole grains and void of sugars and refined starches. The vegan diet was entirely plant-based, included no meat or animal products such as eggs or

milk. The omnivore diet included chicken, fish, eggs, cheese, dairy and other animal-sourced foods.

During the first four weeks, a meal service delivered 21 meals per week—seven breakfasts, lunches and dinners. For the remaining four weeks, the participants prepared their own meals.

A registered dietitian, or "diet whisperer," according to Gardner, was on call to offer suggestions and answer questions regarding the diets during the duration of the study. The participants were interviewed about their dietary intake and kept a log of the food they ate.

Forty-three participants completed the study which, Gardner said, demonstrates how feasible it is to learn how to a prepare a healthy diet in four weeks.

"Our study used a generalizable diet that is accessible to anyone, because 21 out of the 22 vegans followed through with the diet," said Gardner, who is a professor in the Stanford Prevention Research Center. "This suggests that anyone who chooses a vegan diet can improve their long-term health in two months, with the most change seen in the first month."

Improving health

The authors found the most improvement over the first four weeks of the diet change. The participants with a vegan diet had significantly lower low-density lipoprotein cholesterol (LDL-C) levels, insulin and body weight—all of which are associated with improved cardiovascular health—than the omnivore participants.

At three time points—at the beginning of the trial, at four weeks and at eight weeks—researchers weighed the participants and drew their blood.

The average baseline LDL-C level for the vegans was 110.7 mg/dL and 118.5 mg/dL for the omnivore participants; it dropped to 95.5 for vegans and 116.1 for omnivores at the end of the study. The optimal healthy LDL-C level is less than 100.

Because the participants already had healthy LDL-C levels, there was less room for improvement, Gardner said, speculating that participants who had higher baseline levels would show greater change.

The vegan participants also showed about a 20% drop in fasting insulin—higher insulin level is a risk factor for developing diabetes. The vegans also lost an average of 4.2 more pounds than the omnivores.

"Based on these results and thinking about longevity, most of us would benefit from going to a more plant-based diet," Gardner said.

The vegan participants (and the omnivores to some extent) did the three most important things to improve cardiovascular health, according to Gardner: They cut back on saturated fats, increased dietary fiber and lost weight.

A global flair

Gardner emphasizes that although most people will probably not go vegan, a nudge in the plant-based direction could improve health. "A vegan diet can confer additional benefits such as increased gut bacteria and the reduction of telomere loss, which slows aging in the body," Gardner said.

"What's more important than going strictly vegan is including more plant-based foods into your diet," said Gardner, who has been "mostly vegan" for the last 40 years. "Luckily, having fun with vegan multicultural foods like Indian masala, Asian stir-fry and African lentil-based dishes can be

a great first step."

Gardner is a member of the Stanford Cardiovascular Institute, the Wu Tsai Human Performance Alliance, the Maternal and Child Health Research Institute, and the Stanford Cancer Institute.

More information: Cardiometabolic Effects of Omnivorous vs Vegan Diets in Identical Twins, *JAMA Network Open* (2023). dx.doi.org/10.1001/jamanetworkopen.2023.44457

Provided by Stanford University Medical Center