

# Blood fat profiles confirm health benefits of replacing butter with high-quality plant oils

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Blood fat profiles confirm health benefits of replacing butter with high-quality plant oils. Credit: Chalmers University of Technology | Emma Fry

Switching from a diet high in saturated animal fats to one rich in plant-based unsaturated fats affects the fat composition in the blood, which in turn influences long-term disease risk. A recent study published in *Nature Medicine*, conducted by a team of researchers from Chalmers University of Technology, Sweden, the German Institute of Human

Nutrition, Germany and several other universities, shows that it is possible to accurately measure diet-related fat changes in the blood and directly link them to the risk of developing cardiovascular disease and type 2 diabetes.

"Our study confirms with even more certainty the health benefits of a diet high in unsaturated plant fats such as the Mediterranean diet and could help provide targeted [dietary advice](#) to those who would benefit most from changing their [eating habits](#)," says Clemens Wittenbecher, research leader at Chalmers University of Technology and the study's senior author.

The World Health Organization (WHO) highlights the importance of healthy diets in preventing [chronic diseases](#), recommending the replacement of saturated fats with plant-based [unsaturated fats](#) to reduce cardiometabolic risk. However, the certainty of these guidelines is moderate due to limitations in existing studies.

This new study addresses these limitations by closely analyzing fats in the blood, also known as lipids, with a method called lipidomics. These very detailed lipid measurements enabled the researchers to link diet and disease in an innovative combination of different study types. This novel approach combines dietary intervention studies (that use highly controlled diets) with previously carried out cohort studies with long-term health tracking.

## **Diet trials to monitor how changes in food consumption affect blood fat**

Part of this research was conducted in a dietary intervention study at the University of Reading, U.K., which involved 113 participants. For 16 weeks, one group consumed a diet high in saturated [animal fats](#), while

the other group followed a diet rich in unsaturated plant-based fats. Blood samples were analyzed using lipidomics to identify specific lipid molecules reflecting the different diets each participant consumed.

"We summarized the effects on blood lipids with a multi-lipid score (MLS). A high MLS indicates a healthy blood fat profile, and a high intake of unsaturated plant fat and low intake of saturated animal fat can help achieving such positive MLS levels," says Fabian Eichelmann from the German Institute of Human Nutrition Potsdam-Rehbruecke and first author of the study.

These MLS results from the dietary intervention study were then statistically related to the occurrence of [cardiovascular disease](#) and type 2 diabetes in large observational studies that had previously been carried out. These large cohort studies followed initially healthy participants for several years. This analysis of data from both sets of studies showed that participants with a higher MLS, which indicates a beneficial dietary fat composition, had a substantially reduced risk of developing cardiometabolic diseases.

## **Switching to a healthier diet can have the most pronounced health benefits**

Additionally, the study examined whether individuals with low MLS levels, indicating high saturated fat content of the diet, specifically benefited from a healthier diet. The Mediterranean diet focuses on providing more unsaturated plant fats and was used in one of the large intervention trials, known as the PREDIMED trial. Using this study, the researchers found that diabetes prevention was indeed most pronounced in individuals with low MLS levels at the start of the study.

"Diet is so complex that it is often difficult to draw conclusive evidence

from a single study. Our approach of using lipidomics to combine intervention studies with highly controlled diets and prospective cohort studies with long-term health tracking can overcome current limitations in nutrition research," explains Wittenbecher.

**More information:** Lipidome changes due to improved dietary fat quality inform cardiometabolic risk reduction and precision nutrition, *Nature Medicine* (2024). [DOI: 10.1038/s41591-024-03124-1](https://doi.org/10.1038/s41591-024-03124-1)

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