

New study shows significant inflammatory responses after meals

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Acute and prolonged food-induced inflammation can increase the predicted risk of developing cardiometabolic diseases like cardiovascular disease, new research has shown.

The study, published today in *American Journal of Clinical Nutrition*, is the largest in-depth global study to look at postprandial inflammation. Researchers found that inflammation, triggered by [food](#), varies widely between individuals.

Researchers from King's and health science company ZOE were able to identify for the first time the relative influence of [blood sugar](#) and [blood fat levels](#) on inflammation, demonstrating a stronger link with blood fat responses than blood sugar. These findings highlight the potential for personalized strategies to reduce chronic inflammation in preventative health.

Led by Dr. Sarah Berry and her team, in collaboration with Massachusetts General Hospital and additional researchers in the US, UK, Italy, Spain and Sweden, the PREDICT study invited 1,002 [healthy adults](#) taking part in the PREDICT research program to come into the team's research clinic for a day. They were all given two standardized meals to eat, each containing precise amounts of fat, carbohydrate, fiber and protein: breakfast (a muffin and a milkshake) and lunch four hours later (a muffin).

The researchers took blood samples from the participants before the breakfast meal and at nine points throughout the day. These were then analyzed to measure the levels of blood fat and sugar at the different timepoints, along with levels of two markers of inflammation, interleukin 6 (IL-6) and Glycoprotein acetylation (GlycA). The researchers also gathered detailed data on the participants' health, including information about their typical diet, a fecal sample for microbiome analysis, and a body fat scan.

The researchers found that the levels of inflammation after eating varied widely between participants, including identical twins, even though everyone had the same meals at the same intervals.

People with more body fat and greater body mass index (BMI) were more likely to have higher levels of inflammation after eating, supporting current evidence that management of obesity will reduce chronic inflammatory burden. Levels of inflammation also tended to be higher in males than females, and in older participants than younger ones.

There were several strategies recommended to reduce the impact of inflammation after eating.

- Control unhealthy blood fat responses by choosing whole foods that are higher in fiber and lean protein, increasing your intake of healthy omega-3 fats from sources like fish, nuts and seeds, and reducing your overall body fat
- Control unhealthy blood sugar responses by choosing foods containing complex carbohydrates and fiber, such as whole grains, fruit and vegetables, and limiting sugary processed foods and sodas
- Reduce inflammation after eating by choosing foods that are high in 'anti-inflammatory' bioactive molecules such as polyphenols, found in colorful fruits and vegetables and other plant-based foods
- Understand your biology and choose foods that are less likely to cause unhealthy blood fat or sugar responses after eating

Tim Spector, Professor of Genetic Epidemiology at King's and scientific co-founder of ZOE, adds, "Previous results from our PREDICT study showed that the combination of microbes living in our guts, known as the gut microbiome, is closely linked to how we respond to food, particularly fat. We have also found that microbiome composition is strongly associated with GlycA levels, opening the door to reducing food-related [inflammation](#) and improving health by manipulating the microbiome."

More information: Mohsen Mazidi et al, Meal-induced inflammation: postprandial insights from the Personalised REsponses to Dietary Composition Trial (PREDICT) study in 1000 participants, *The American Journal of Clinical Nutrition* (2021). [DOI: 10.1093/ajcn/nqab132](https://doi.org/10.1093/ajcn/nqab132)

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