

Humans more unique than expected when it comes to digesting fatty meals

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Credit: USDA-ARS

People have very individualized inflammatory responses to eating a high-fat meal.

These were the somewhat unexpected results of a study recently

published in the *Journal of Nutritional Biochemistry* by researchers at the Agricultural Research Service (ARS) and their University of California-Davis colleagues.

"We looked at the inflammatory reactions of 20 volunteers at 0, 3 and 6 hours after eating a standardized meal containing 38 percent fat and their responses were completely unique. Like snowflakes, no two were exactly the same," explained molecular biologist Danielle G. Lemay at the ARS Western Human Nutrition Research Center in Davis, California.

Inflammation—defined as a group of responses by the [body](#) telling [white blood cells](#) how much to react—is a normal reaction to eating a meal, especially one with high amounts of fat. Inflammatory responses are not the same as the blood sugar reactions that also follow eating.

Inflammation is the defense mechanism in the body as the body attempts self-protection. It also is part of the body's [immune response](#).

Each volunteer in the study had both a unique amount of inflammatory response and a unique amount of time for when the responses peaked, up to 6 hours after eating (8 or more hours is considered fasting by nutritionists).

The researchers used a very sensitive test to look at whether any genes in the human genome were turned off or on in order to define a volunteer's reactions. Responses by more than 13,000 genes differed between subjects.

The test meal was equivalent to someone having a small hamburger, small fries, and a small ice cream shake with fruit, according to the scientists.

"Eating a meal with this amount of fat is OK one or two days a week

even considering the effect on [inflammation](#). But in a lifetime of meal choices, eating like this every day could do some damage to a person's body," said Lemay.

Inflammation is associated with a whole host of conditions such as asthma, diabetes, [peptic ulcers](#), [rheumatoid arthritis](#), and many others.

One reason these results are so fascinating is the growing interest in personalized nutrition.

"We need to understand what the variability is between people before we can consider starting to set different requirements in diets," Lemay said.

More information: Danielle G Lemay et al. Temporal changes in postprandial blood transcriptomes reveal subject-specific pattern of expression of innate immunity genes after a high-fat meal, *The Journal of Nutritional Biochemistry* (2019). [DOI: 10.1016/j.jnutbio.2019.06.007](https://doi.org/10.1016/j.jnutbio.2019.06.007)

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