

# Gene related to fat preferences in humans found

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A preference for fatty foods has a genetic basis, according to researchers, who discovered that people with certain forms of the CD36 gene may like high-fat foods more than those who have other forms of this gene.

The results help explain why some people struggle when placed on a low-fat diet and may one day assist people in selecting diets that are easier for them to follow. The results also may help [food developers](#) create new low-fat foods that taste better.

"Fat is universally palatable to humans," said Kathleen Keller, assistant professor of [nutritional sciences](#), Penn State. "Yet we have demonstrated for the first time that people who have particular forms of the CD36 gene tend to like higher fat foods more and may be at greater risk for obesity compared to those who do not have this form of the gene. In animals, CD36 is a necessary gene for the ability to both detect and develop preferences for fat. Our study is one of the first to show this relationship in humans."

Keller and a team of scientists from Penn State, Columbia University, Cornell University and Rutgers University examined 317 African-American [males and females](#) because individuals in this ethnic group are highly vulnerable to obesity and thus are at greatest risk for obesity-related diseases.

The team gave the participants Italian [salad dressings](#) prepared with varying amounts of canola oil, which is rich in long-chain fatty acids. The participants were then asked to rate their perceptions of the dressings' oiliness, [fat content](#) and creaminess on a scale anchored on the ends with "extremely low" and "extremely high."

The team also gave participants questionnaires aimed at understanding their food preferences. Participants rated how much they liked each food

on a scale anchored with "dislike extremely" and "like extremely." Foods included on the questionnaire were associated with poor [dietary intake](#) and [health outcomes](#), such as half-and-half, sour cream, mayonnaise, bacon, fried chicken, hot dogs, [French fries](#), cheese, chips, cake, cookies and doughnuts. The researchers collected saliva samples from the participants to determine which forms of CD36 they had. From the saliva samples, they extracted DNA fragments and examined differences in the CD36 gene contained within the fragments.

They found that participants who had the "AA" form of the gene -- present in 21 percent of the population -- rated the salad dressings as creamier than individuals who had other forms of the gene. These individuals reported that the salad dressings were creamier regardless of how much fat was actually in them. The researchers also found that "AA" individuals liked salad dressings, half-and-half, olive oil and other cooking oils more than those who had other forms of the gene. The results are published in a recent issue of the journal *Obesity*.

"It is possible that the CD36 gene is associated with fat intake and therefore obesity through a mechanism of oral fat perception and preference," said Keller. "In other words, our results suggest that people with certain forms of the CD36 gene may find fat creamier and more enjoyable than others. This may increase their risk for obesity and other health problems."

According to Keller, having certain forms of a gene that help in the perception and enjoyment of fats in foods might once have been an advantage.

"Fats are essential in our diets," she said. "In our evolutionary history, people who were better able to recognize fats in foods were more likely to survive. Such forms of the gene, however, are less useful to us today as most of us no longer have to worry

about getting enough fats in our diets."

In fact, she added, having such forms of a gene can be detrimental in today's world of fat-laden convenience foods.

"Our results may help explain why some people have more difficulty adhering to a low-fat diet than other people and why these same people often do better when they adopt high-fat, low-carbohydrate diets such as the Atkins diet," said Keller. "We hope these results will one day help people select diets that are easier for them to follow. We also think the results could help food developers create better tasting low-fat foods that appeal to a broader range of the population."

In the future, the team plans to expand the population they examine to include children.

"By the time we are adults it is very hard for us to change our eating behaviors," said Keller. "So if we can determine which children have forms of the CD36 gene, as well as other [genes](#) that are associated with greater liking of fats, we can help them develop healthier eating behaviors at a young age."

Keller also plans to incorporate novel techniques, such as functional magnetic resonance imaging (fMRI), to better understand why certain forms of the CD36 gene are linked to higher fat preferences.

"We plan to scan children while they are tasting high-fat foods and beverages so that we can see how their brains react to fats," she said. "By doing this, we may be able to develop foods that are perceived by the brain as palatable high-fat treats, even though in reality, they are low-fat and healthy."

Provided by Pennsylvania State University

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