

Studies find that manipulating gut microbes may reverse the negative effect of a high fat

12 July 2016

Did you know that your gut sends neural messages to the brain to tell it when it is full? Researchers at the University of Georgia, Binghamton University, and Pennsylvania State University have now found that chronic consumption of high fat foods disturbs these neural messages in rats by shifting the populations of bacteria that ordinarily reside inside the gut. Delaying the fullness message can lead to overeating and eventual weight gain. Dr. Claire de La Serre and colleagues found that this negative effect may be reversed by manipulating the gut microbes. This research is to be presented this week at the Annual Meeting of the Society for the Study of Ingestive Behavior (SSIB), the foremost society for research into all aspects of eating and drinking behavior.

In one study the researchers found that high fat feeding reorganizes the [gut-to-brain](#) neural pathway and triggers inflammation in brain regions responsible for feeding behavior. High fat diets have been found to dramatically affect the gut microbiota composition, so the researchers tested if these resident microbes may be the connection between the diet and neural changes. De La Serre and colleagues developed a protocol to correct the negative shift in [gut microbes](#). By injecting daily a low dose of a large spectrum antibiotic they were able to reverse the effects of high fat diet on the microbiota composition. Interestingly, when the bacteria composition was brought back to normal, the disturbed gut-brain signals and brain inflammation were also corrected. As a result, antibiotic-treated animals ate less and gained less weight. This shows that the gut bacteria which thrive during a high fat diet are playing a role in the damaging effects of the diet on brain signals. Pursuing this research could eventually lead to bacteria-based therapies for treatment of overeating and obesity.

"We then wanted to test if foods known to have anti-bacterial and anti-inflammatory properties could also reverse the negative effect of a high fat

diet, similarly to the antibiotic treatment," explained Claire de La Serre. In a separate study, the researchers fed animals a [high fat diet](#) and supplemented some of them with blueberry, a fruit packed with anthocyanins, a natural anti-microbial ingredient. Animals fed blueberries had a completely different microbiota profile, less inflammation, and more stable blood sugar levels. Thus, specific properties of bioactive foods may be used to target and improve the microbiota composition and overall health.

More information: Bacteria-driven brain plasticity triggers obesity, Annual Meeting of the Society for the Study of Ingestive Behavior (SSIB), 2016.

Blueberry supplementation impacts gut microbiota and insulin sensitivity in high-fat fed rat, Annual Meeting of the Society for the Study of Ingestive Behavior (SSIB), 2016.

Provided by Society for the Study of Ingestive Behavior

APA citation: Studies find that manipulating gut microbes may reverse the negative effect of a high fat (2016, July 12) retrieved 20 July 2022 from <https://medicalxpress.com/news/2016-07-gut-microbes-reverse-negative-effect.html>

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