

Western diets turn on fat genes

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Those extra helpings of gravy and dessert at the holiday table are even less of a help to your waistline than previously thought. According to a new research report recently appearing online in *The FASEB Journal*, a diet that is high in fat and in sugar actually switches on genes that ultimately cause our bodies to store too much fat. This means these foods hit you with a double-whammy as the already difficult task of converting high-fat and high-sugar foods to energy is made even harder because these foods also turn our bodies into "supersized fat-storing" machines.

In the research report, scientists show that foods high in fat and sugar stimulate a known opioid receptor, called the kappa opioid receptor, which plays a role in fat [metabolism](#). When this receptor is stimulated, it causes our bodies to hold on to far more fat than our bodies would do otherwise.

According to Traci Ann Czyzyk-Morgan, one of the researchers involved in the work, "the data presented here support the hypothesis that overactivation of kappa opioid receptors contribute to the development of [obesity](#) specifically during prolonged consumption of high-fat, calorically dense diets."

To make this discovery, Czyzyk-Morgan and her colleagues conducted tests in two groups of mice. One group had the kappa opioid receptor genetically deactivated ("knocked out") and the other group was normal. Both groups were given a high fat, high sucrose, energy dense diet for 16 weeks. While the control group of mice gained significant weight and fat

mass on this diet, the mice with the deactivated receptor remained lean. In addition to having reduced fat stores, the mice with the deactivated receptor also showed a reduced ability to store incoming nutrients.

Although more work is necessary to examine what the exact effects would be in humans, this research may help address the growing obesity problem worldwide in both the short-term and long-term. Most immediately, this research provides more proof that high-fat and high-sugar diets should be avoided. In the long-term, however, this research is even more significant, as it provides a new drug target for developing therapies for preventing obesity and helping obese people slim down.

"In times when food was scarce and starvation an ever-present threat, an adaptation that allows our bodies to store as much energy as possible during plentiful times was probably a lifesaver," said Gerald Weissmann, M.D., Editor-in-Chief of *The FASEB Journal*. "By taking that opioid receptor off the table, researchers may have found a way to keep us from eating ourselves to death."

More information: Traci A. Czyzyk, Ruben Nogueiras, John F. Lockwood, Jamie H. McKinzie, Tamer Coskun, John E. Pintar, Craig Hammond, Matthias H. Tschöp, and Michael A. Statnick -Opioid receptors control the metabolic response to a high-energy diet in mice. *FASEB J.* [doi:10.1096/fj.09-143610](https://doi.org/10.1096/fj.09-143610)

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