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Cutting Off Your Nose To Spite Your Weight

By Julianna LeMieux — July 19, 2017

Food on a grill [1]

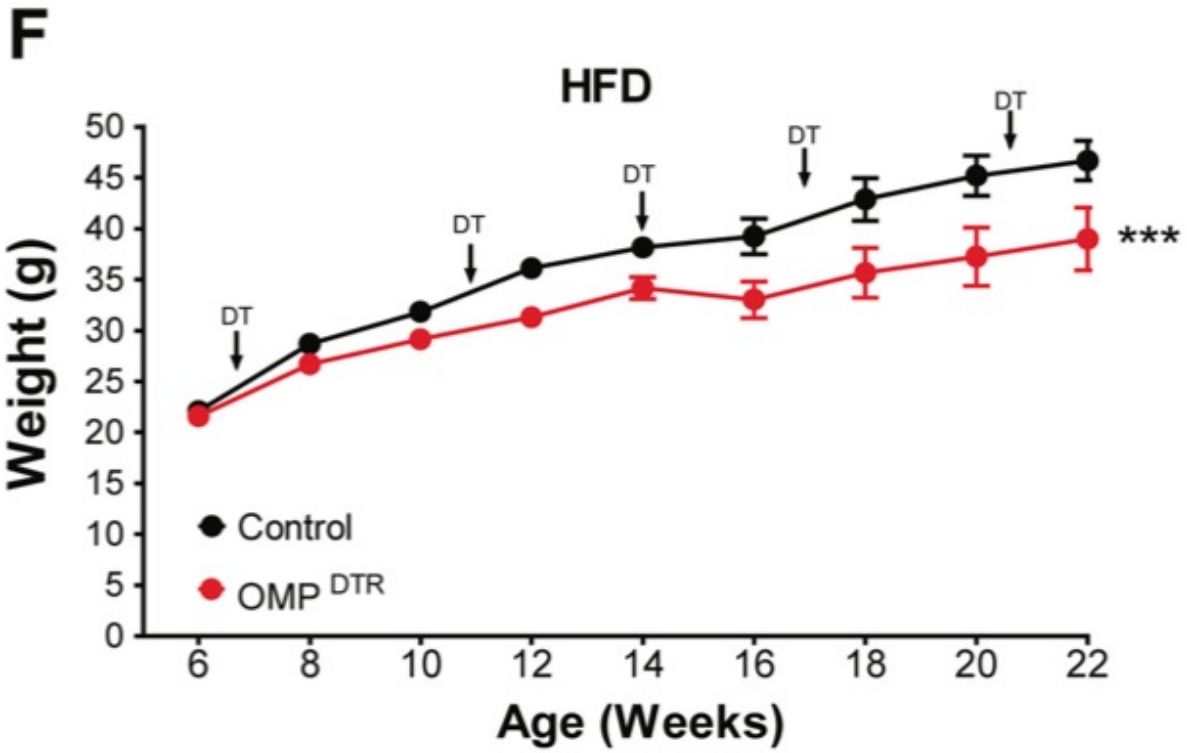
There may be a way to lose weight while eating a high-fat diet and you wouldn't even have to sell your soul to the devil. But, you would have to stop smelling for a while.

Let me explain.

If you have walked by a summertime BBQ with the grill going or a bakery with hot ovens full of baked goods, you know the role that smell plays in our appetite and subsequently, our weight.

So, it makes sense that an effective way to lose weight would be to remove the ability to smell. If you smell less you eat less. And, that is exactly what happened to some obese mice in the labs at the University of California at Berkeley. But, there was one big surprise in the results that came from the experiment.

The mice that could not smell ate as much of the same food (which was high in fat) as mice that could smell, but they still lost weight. It sounds unbelievable, I know. The data are shown in the figure below. The control (normal) mice are shown in black and the mice that had their ability to smell removed are in red.



In addition, mice that had an increased ability to smell (super-smellers) gained more weight on the same diet as mice that smelled normally (not shown in the above figure.) The work, published in a paper entitled The Sense of Smell Impacts Metabolic Health and Obesity [2], was published on July 5th in *Cell Metabolism*.

How was the sense of smell removed? The neurons that are responsible for the ability to smell (olfactory neurons) were destroyed using a genetic tool that targeted the olfactory neurons specifically for death. When those cells are destroyed, the animal cannot smell. However, the stem cells (cells that make the olfactory neurons) were left intact. Therefore, after some time, new olfactory neurons would return making the loss of smell temporary - about three weeks.

What the authors have begun to tease apart is the role of smell in how we eat from how our body treats what we eat. They knew from prior research that smell is heightened when animals are hungry, while the sense is diminished after eating.

They examined the physiology that accompanies a loss of smell and found changes in certain metabolic pathways when smell is removed. In particular, certain signals in adipose (fat) tissues are increased that could lead to the faster breakdown of fatty tissue. As a result, the mice used their cells that burn fat more efficiently. The obese mice also improved their glucose tolerance - a co-morbidity with obesity.

If true, this result means that the presence of olfactory neurons (or the ability to smell our food)

may have a role in how the energy from our food is metabolized.

One theory is that blocking the smell of food tricks our body into thinking that food was just consumed, and the body responds by increasing the breakdown of food. Although the area of the brain that controls this response is unknown, the authors speculate that the hypothalamus may play a part. The hypothalamus is both connected to the olfactory neurons and plays a major role in endocrine signaling (hormones) and also areas such as hunger, thirst, and the temperature of the body.

The results are interesting, and point to the fact that our weight is determined by more than just what we eat - but bring in a factor of how we are eating as well. If all goes well - and that's a big if - alteration of the sense of smell in humans may aid with weight loss while allowing people to eat as they do normally (even if that diet is not very healthy).

Based on these results, it does not seem too far fetched to imagine a weight loss program that includes a period of time where the sense of smell is diminished but a normal diet can be maintained. I would bet that most people would trade smell loss for weight loss, especially if they don't have to diet.
