Hunger hormone enhances sense of smell

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An appetite-stimulating hormone causes people and animals to sniff odors more often and with greater sensitivity, according to a new study in the April 13 issue of *The Journal of Neuroscience*. The findings suggest ghrelin may enhance the ability to find and identify food.

Researchers led by Jenny Tong, MD, and Matthias Tschöp, MD, at the University of Cincinnati found the appetite-related hormone also influences smell. The new study shows ghrelin, made mainly in the stomach, binds to molecules in the brain's olfactory bulb, suggesting the hormone is directly involved in odor processing.

"This new function of ghrelin was unknown prior to our discovery," Tong said. "We think ghrelin is part of an important interface designed to help detect calories in our environment and to link those sensory inputs with the internal regulation of metabolism and body weight."

Previous studies suggested sniffing may help people identify sources of nutrition, particularly during fasts when the sense of smell improves. For this reason, the authors predicted ghrelin, which normally spikes before meals, acts on olfactory regions and leads to behavioral changes — such as sniffing — to help spur food intake.

In this study, Tong and her colleagues measured how rats and people react to different odors. When small amounts of ghrelin were delivered directly to rats' brains, the animals sniffed more often. The ghrelin-treated rats also avoided water with low concentrations of an odor associated with sickness more than untreated rats.

Nine humans who received ghrelin infusions also reacted to stimuli differently. Each volunteer was directed to whiff unperfumed air or baby powder, banana, tomato, or rosemary chicken scents. Participants given ghrelin inhaled more deeply.

Thomas Hummel, MD, of the University of Dresden, an expert in smell and taste who was unaffiliated with the study, noted that the results suggest ghrelin affects odor detection, but not appeal. The volunteers reported no difference in aroma pleasantness.

"Overall, this report seems to confirm that ghrelin is an important modifier of appetite — and eating behavior," Hummel said.

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