

## IS FAT THE SIXTH PRIMARY TASTE?

In recent years, a number of studies have focused on the detection of fat by the brain, but the results are still the subject of much debate. Some authors have observed that brain activation is only triggered by the non-taste properties of fat foods (texture and viscosity). Other authors have shown that, just like sweet foods, fat foods activate the gustatory brain areas in the reward system (orbitofrontal cortex and anterior cingulate cortex). This latter finding as well as the evidence of fatty acid receptors in the oral cavity of both rodents and humans suggest that fat could be the sixth primary taste (along with sweet, salt, sour, bitter and umami).

In this context, researchers from the CSGA recorded the brain activity of 18 normal-weight young adults in response to various solutions of free fatty acids applied on their tongues. Brain activity was measured by recording gustatory evoked potentials using electrodes placed around participant's head (electroencephalography). Five fatty acids were tested: a short-chain fatty acid (caproic acid), a medium-chain fatty acid (lauric acid), a long-chain saturated fatty acid (stearic acid), a long-chain monounsaturated fatty acid (oleic acid), a long-chain polyunsaturated fatty acid (linoleic acid). All these fatty acids are naturally found in many foods (oils, dairy products, etc.).

In all participants, the five free fatty acid solutions induced gustatory-evoked potentials similar to those induced by salty and sweet taste. This study is the first demonstration that the gustatory areas of the brain are activated by free fatty acids. It reinforces the concept that fat is the sixth primary taste and opens up new avenues of research to better understand the biological mechanisms leading to obesity.



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### To know more

Mouillot T, Szeleper E, Vagne G, Barthet S, Litime D, Brindisi MC, Leloup C, Penicaud L, Nicklaus S, Brondel L, Jacquin-Piques A (2019). Cerebral gustatory activation in response to free fatty acids using gustatory evoked potentials in humans. *The Journal of Lipid Research*, 60, 661-670.

### Mots-clefs

Fat; taste; gustation; detection; free fatty acid; brain; evoked potentials