Taste Perception and Obesity

There are five basic tastes that humans perceive on the tongue including bitter, sweet, salty, sour and umami which is the savory taste of monosodium glutamate. The taste cells of the tongue have specialized proteins that separately signal bitter, sweet, and umami compounds. The mechanisms of salty and sour taste transduction use different signal channels but the pathways are not yet defined. Sugars, such as glucose and fructose, and non-caloric sweeteners, such as sucralose, activate the tongue's sweet receptor, whereas MSG and other savory amino acids are detected by a different receptor. Toxic plant alkaloids, such as strychnine and other bitter compounds, activate one or more of approximately thirty different bitter receptors that act as defense mechanisms against poisons. There are also taste receptors in the intestinal tract and these lead to the release of hormones affecting appetite.

A difference in taste perception has been observed between obese and normal weight individuals. It has been suggested that differences in taste perception can cause differences in food choices and energy consumption. The intake of a specific food relative to the intake of other foods is strongly affected by sensory-specific satiety. Sensory systems, and especially taste, plays a significant role in the enjoyment of food and the control of food intake. It has been shown that increased intake and decreased taste in obesity appear to be correlated in human experimental studies. In a recent study of 179 obese women visceral fat correlated more strongly with the decrease in taste than did age, body mass index, or obesity-related hormones including leptin, adiponectin, and visfatin. The concept supported by this research is that obese patients consume more food and more calories since they do not taste them as strongly as lean individuals. More research is needed on how the gut receptors, taste receptors on the tongue and the brain interact.

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