

'Seeing' the flavor of foods

April 11 2013

The eyes sometimes have it, beating out the tongue, nose and brain in the emotional and biochemical balloting that determines the taste and allure of food, a scientist said here today. Speaking at the 245th National Meeting & Exposition of the American Chemical Society (ACS), he described how people sometimes "see" flavors in foods and beverages before actually tasting them.

"There have been important new insights into how people perceive [food](#) flavors," said Terry E. Acree, Ph.D. "Years ago, [taste](#) was a table with two legs—taste and odor. Now we are beginning to understand that flavor depends on parts of the [brain](#) that involve taste, odor, touch and vision. The sum total of these signals, plus our emotions and past experiences, result in perception of flavors, and determine whether we like or dislike specific foods."

Acree said that people actually can see the flavor of foods, and the eyes have such a powerful role that they can trump the [tongue](#) and the nose. The popular Sauvignon Blanc white wine, for instance, gets its flavor from scores of natural chemicals, including chemicals with the flavor of banana, passion fruit, bell pepper and boxwood. But when served a glass of Sauvignon Blanc tinted to the deep red of merlot or cabernet, people taste the natural chemicals that give rise to the flavors of those wines.

The sense of smell likewise can trump the taste buds in determining how things taste, said Acree, who is with Cornell University. In a test that people can do at home, psychologists have asked volunteers to smell caramel, strawberry or other sweet foods and then take a sip of plain

water; the water will taste sweet. But smell bread, meat, fish or other non-sweet foods, and water will not taste sweet.

While the appearance of foods probably is important, other factors can override it. Acree pointed out that hashes, chilies, stews and cooked sausages have an unpleasant look, like vomit or feces. However, people savor these dishes based on the memory of eating and enjoying them in the past. The human desire for novelty and new experiences also is a factor in the human tendency to ignore what the eyes may be tasting and listening to the tongue and nose, he added.

Acree said understanding the effects of interactions between smell and vision and taste, as well as other odorants, will open the door to developing healthful foods that look and smell more appealing to finicky kids or adults.

More information: Abstract

The chemistry of food includes substances that activate chemosensory, somatosensory, and visual receptors located at the periphery of the nervous system, e.g. in odor, taste, touch, and light sensitive cells. These cells originate signals that travel to different parts of the brain creating recognizably different sensations. Furthermore, these sensations combine to create judgments of a foods identity, valance (pleasantness), and hedonics (liking) shaping a consumer's expectations and attitudes toward the food (Deliza and MacFie 1996; Garber et al. 2001). Flavor is the total of these experiences. Although the rules that governs how the sensory modes are summed to express flavor remains a mystery, there are indications that the rules are complex and profound. For example, several sensory studies have shown that the odor descriptors used for white wines are replaced by those used to describe red wines when subjects taste white wine colored red. This paper will review our present knowledge of cross-modal interactions between odor and vision and

describe results from studies of the effects of odor-vision congruency on the detection of pure odorants.

Provided by American Chemical Society

Citation: 'Seeing' the flavor of foods (2013, April 11) retrieved 20 June 2024 from <https://phys.org/news/2013-04-flavor-foods.html>

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