

Why do we prefer some foods over others?

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When your stomach grumbles at lunchtime, and it's your turn at the deli counter, what will it be? Wheat bread or rye bread? Turkey or pastrami? Mayonnaise or mustard? Hold the pickle!

The choices may seem trivial, but they connect to something ancient inside us. In fact, says Thomas Pritchard, associate professor of neural and behavioral sciences, our food preferences are an outgrowth of the survival instincts we share with other animals. In the end, says Pritchard, we aren't much different from rats.

Rats cannot vomit, he explains. "When a rat eats something, it's forever." Considering where the average rodent forages for food, this digestive shortcoming can have serious health consequences.

To avoid poisoning, a rat, when it encounters an unfamiliar taste, "will nibble at the food and walk away," Pritchard noted. It then waits -- up to 24 hours -- to see if the minuscule bite will make it sick. If it does get sick, it learns to avoid that flavor in the future. This neophobia (fear of novelty), combined with the ability to form taste-illness associations after a single pairing, make rats true survivors in the wild. For rats, being a picky eater is a matter of life and death.

Human taste has evolved in a similar way. "The senses of taste and smell evolved to help us identify nutritious foods and poisonous substances," Pritchard said. Acidity for example, is usually an indication of spoilage, while bitterness signals our brain to think "poison." Even the common "sweet tooth" may be rooted in survival instinct, he suggested.

Carbohydrates, typically sweet, are a vital energy source to a wild animal continuously on the go. The evolved ability to associate sweetness with energy may lie behind our present-day preferences for ice cream and candy bars, Pritchard speculates.

For modern humans, foraging requires just a short drive to the grocery store. Unfortunately, easy access to food exploits our evolved sense of taste preference. "Taste and smell, the two senses that have worked so well to get us through the times when food was not conveniently available, may now be working against us," said Pritchard. Thus, the pervasive sweetness and saltiness of processed foods satisfies our instinctive hungers, but ends up creating new "survival" problems, such as obesity, heart disease and diabetes. "That's the price we pay for attending to the hedonic properties of food instead of the long term health consequences of our diet," he said.

Along with sweet and bitter, the tongue distinguishes three other primary taste qualities; salty, sour, and umami (Japanese for savory). These basic taste qualities, in combination with the senses of smell and touch, allow us to recognize thousands of different flavors, Pritchard says. It's no wonder we're picky eaters.

Psychological factors add another layer of complexity to food perception. Children develop food preferences through exposure and association, Pritchard explains. When children encounter chili peppers early and often, for example, the chances are high that they will like them as adults. Similarly, a child who remembers eating a particular food when feeling sick, happy, irritated, or distressed, may associate that flavor with a specific feeling for the rest of his or her life.

In fact, Pritchard says, research confirms that the five basic tastes are at the vanguard of food preference. "Taste information goes through the nervous system in a serial fashion," he said, first to primitive brain areas

in the brain stem, and then -- as more complex factors such as memory, emotion, and motivation kick in -- to more recently evolved regions in the forebrain.

"Taste is much more than a recreational sense we take to McDonalds to show ourselves a good time," Pritchard concludes. From the taste buds on our tongues to the inner sanctum of the brain, we are still hardwired to prefer the foods that helped our species survive. As for why some choose mustard over mayonnaise -- chalk it up to experience.

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