Bitter tastes quickly turn milk chocolate fans sour

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Dark chocolate lovers can handle a wider range of bitter tastes before rejection compared to milk chocolate fans, according to Penn State food scientists.

In a test of bitterness rejection levels in chocolate, people who prefer milk chocolate quickly detected—and disliked—milk chocolate with a bitter substance added to the candy, according to Meriel Harwood, a graduate student in food science. Dark chocolate fans had significantly higher tolerance to the added bitterness than people who like milk chocolate.

"In some cases, you may be able to detect a change in the taste of your food, but that might not necessarily lead to disliking the product," said Harwood. "However, almost immediately, people who preferred milk chocolate indicated they tasted something different and they didn't like it."

The researchers, who report their findings in the online version of the Journal of Food Science, divided a group of 85 participants into two groups based on their self-identified preferences in chocolate. A total of 43 people told researchers they preferred milk chocolate, and 42 people said they preferred dark chocolate.

Participants tried a series of pairs of dime-sized chocolate samples. In each pair, one sample contained sucrose octaacetate—SOA—a bitter-tasting substance, and the other did not. In each successive pair, the next

samples contained increasing amounts of SOA.

The milk chocolate group quickly rejected the samples with SOA, while the dark chocolate group continued to like the candy, Harwood said. The dark chocolate group had a rejection threshold more than 2.5 times the rejection threshold level of those who prefer milk chocolate.

Harwood, who worked with Greg Ziegler, professor of food science, and John Hayes, assistant professor of food science and director of the sensory evaluation center, said that tests of rejection thresholds in food may be a simpler and more direct way to test food acceptability rather than measuring when the consumer can taste something different—detection thresholds. The detection threshold test is one of the most common taste tests used in sensory science and is usually paired with affective—or, consumer—testing to determine preferences.

People do not always dislike a food because they detect something different, even if that difference may be considered a defect or undesirable attribute, according to Harwood.

"There may be a disconnect between preferences and the ability to detect tastes, like bitterness," said Harwood. "In other words, using detection threshold tests may not predict consumer acceptability."

Previous studies on cork taint in wine have shown that even though wine drinkers tasted the cork taint, they did not necessarily find the wine objectionable.

"We bring a bunch of cultural and emotional baggage with us when we eat," said Harwood. "What you grow up with, what you are used to, what you know, for example, can all influence your preferences."

Harwood said rejection threshold tests may lead to cost-savings for the

food industry.

Rather than disposing products that are thought to be undesirable and wasting costly materials, researchers could use rejection thresholds to find out whether consumers will object to the taste of a product. Food manufacturers may also be able to use alternative ingredients, such as sugar or salt replacements, if they can first identify a rejection threshold level for those ingredients in products. This could give product developers more versatility when they create recipes.

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