

Sensation seekers, risk-takers who experience more bitterness apt to drink IPAs

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A lager beer and two pale-ale-style beers were chosen as the test stimuli. The specific beer samples were selected by research staff following benchtop tasting of various commercial pale-ale-style beers sold in Pennsylvania. To represent the range of bitterness in commercial pale ales, researchers selected one pale ale that was strongly bitter and one that was moderately bitter. Credit: Molly Higgins

People who seek novel and powerful sensations and are more prone to taking risks—and who perceive bitter tastes more intensely—are more likely to prefer bitter, pale-ale-style beers and drink them more often, according to Penn State sensory researchers, who conducted a study that involved blind taste tests and personality assessments.

The results of the study, which involved more than 100 beer consumers, were unexpected, explained researcher John Hayes, associate professor of food science, because previous research typically indicates that greater perceived [bitterness](#) leads to decreased intake of bitter foods and drinks.

"Traditionally, most researchers find that people

who experience bitterness more intensely avoid bitter food or drink—so with heightened bitterness, they like it less, and therefore consume it less," he said. "But here, we find that people who seek higher sensations and are more risk-taking, they like bitter beer such as India pale ales, if they also have greater bitter taste perception."

The connection between food liking and personality has been seen before, noted Hayes, director of Penn State's Sensory Evaluation Center. In a study spearheaded by one of his former doctoral students, his research group in the College of Agricultural Sciences found robust links between the liking of spicy foods and the high-sensation-seeking, risk-taking personality traits. Studies done in Mexico and Italy also have revealed similar findings.

These results highlight the importance of considering personality traits such as sensation seeking when considering the relationship between bitterness perception and the liking and intake of bitter food and beverage products, said lead researcher Molly Higgins, who will receive her doctoral degree in food science this August.

"Our data contradict the classic view that bitterness is merely an aversive sensation that limits intake. We found that increased bitterness perception does not always lead to decreased liking and intake—rather, it's a positive attribute in some products for some consumers."

In Higgins' study, 109 beer consumers rated liking and intensity of two pale ales and a lager, and the intensity of two bitter solutions—quinine, the compound that makes tonic water bitter, and hops extract Tetralone—under blind laboratory conditions. Participants also completed intake and personality questionnaires. A liking ratio for each beer was calculated from each participant's liking for that specific beer and their total liking for all beers.

Participants, about half men and half women, most in their 30s, were classified as weekly, monthly or yearly pale-ale consumers using intake data. Using intensity ratings, personality measures and other parameters, the researchers developed models to predict liking ratios and beer-intake frequency.

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To represent a lager-style beer with low bitterness, research staff selected Budweiser. The pale-ale-style beers used in the study were Founder's All-Day IPA Session Ale as the moderately bitter ale, and Troeg's Perpetual IPA Imperial Pale Ale, as the strongly bitter ale.

A significant interaction between sensation seeking and quinine bitterness was found for the liking ratio of the imperial pale ale, Higgins pointed out. But the relationship was not straightforward.

"The interaction revealed liking of the pale ale increased with sensation seeking but only if quinine bitterness was also high," she said. "Intake models showed increased odds of frequent pale-ale intake with greater quinine bitterness and lower liking for lager [beer](#). These data suggest liking and intake of pale ales is positively related to sensation seeking and bitter taste perception."

The findings, recently published in *Food Quality and Preference*, suggest that further research on the relationship between personality traits and the liking and intake of bitter foods and beverages may lead to new strategies to promote consumption of healthy bitter foods, Higgins contended.

"Avoidance of bitter foods can impact health negatively, because bitter foods such as cruciferous vegetables, green tea and grapefruit contain healthy compounds like flavonols, which are reported to have antioxidant and anticarcinogenic properties," she said.

Alyssa Bakke, staff sensory scientist in [food science](#), also was involved in the research.

More information: Molly J. Higgins et al, Personality traits and bitterness perception influence the liking and intake of pale ale style beers, *Food Quality and Preference* (2020). [DOI: 10.1016/j.foodqual.2020.103994](#)

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