Food Scientists Work to Block Bitter Food Tastes

Institute of Food Technologists

Food scientists are working to block, mask and/or distract from bitter tastes in foods to make them more palatable to consumers, many of whom are genetically sensitive to bitter tastes, according to a new presentation at the 2014 Institute of Food Technologists (IFT) Annual Meeting & Food Expo® in New Orleans.

"Many factors go into why we eat what we do," said John Hayes, PhD, assistant professor of food science and director of the Sensory Evaluation Center at Pennsylvania State University, with taste consistently ranking as number one. There's also "a huge variability in how much bitterness people taste. If something is bitter you like it less and you eat it less."

Many foods, such as broccoli, spinach, asparagus, kale, Brussels sprouts, grapefruit, tea, soy and caffeine, have a bitter taste. People with a high sensitivity to bitterness eat 25 percent fewer vegetables, said Hayes.

The bitter perception is "highly complex," according to Hayes, with 25 known bitter receptor genes. "It's also not destiny. Learning can override innate aversions. You can learn to like things."

And yet as consumer preference grows for products with specific nutrients or ingredients, food scientists are working to mask or diminish bitter and other tastes, said Robert Sobel, PhD, vice president of research and innovation at FONA International.

"There's an increasing market opportunity to attenuate bitterness perception and improve palatability and preference among consumers," said Sobel.

In high-energy drinks, for example, consumers are seeking a high level of caffeine, and yet caffeine can be very bitter. Food manufacturers often add a "high-intensity" sweetener to energy drinks, and because the brain has a preference for sweetness, it diminishes the perception of bitterness. The addition of "phantom aromas," such as vanilla, berry, citrus, bacon or even cheese, can distract the brain from acknowledging a bitter to taste.

Other additives can mask or "mitigate a bitter taste." Lactisole, for example, made from carboxylic acid salt derived from Columbian coffee, can negate sweet taste. An allosteric modulator can change a food or ingredient's protein structure reducing the salty, sweet or bitter signal to the brain.

When deciding which food additives to use to diminish bitter taste, "formulators must consider differences in regional diets for effective solutions," said Sobel.

About IFT

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