

Fruit may mask taste of dark green vegetables in commercial baby foods

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Researchers found that there were no commercially available single, dark green vegetable products. Instead, dark green vegetables often were mixed with fruits or red/orange vegetables — such as squash — that provide additional sweetness. Credit: Pennsylvania State University

Commercially prepared baby foods that purport to be loaded with dark

green vegetables are sweetened with fruit puree and often don't contain a high percentage of dark green vegetable content, according to a team of researchers.

The resulting lack of dark green vegetable taste matters, said team leader John Hayes, associate professor of food science at Penn State, because young children don't learn to like the taste of broccoli, spinach, brussels sprouts and kale, to name a few, unless they repeatedly are exposed to them. So they may not want to eat them later.

"Other research indicates young kids need to be exposed to the [flavor](#) of vegetables to learn to like them," he said. "If true, this new work is key because it shows that current commercial products on the market fail to meet this need, as they cover up and hide the flavor of vegetables—even when vegetables are on the ingredient list."

Because vegetables are an important but under-consumed part of a healthy diet, there is growing interest in promoting vegetable acceptance and consumption among infants to help establish life-long healthy eating patterns, noted Hayes, director of the Sensory Evaluation Center in Penn State's College of Agricultural Sciences.

He suggested that many well-meaning parents who want their young children to eat and like dark green vegetables may be fooled by misleading content descriptions.

"If parents don't stop and taste these foods themselves, the front of the package may lead them to think these products taste like vegetables rather than a fruit puree," he said.

A recent survey of commercial baby [food](#) products in the United States conducted by some researchers on the team revealed a lack of variety in the types of vegetables offered. Most notably, there were no

commercially available single, dark green vegetable products. Instead, dark green vegetables often were mixed with fruits or red/orange vegetables—such as squash—that provide additional sweetness.

For the liking of vegetables to be learned, the flavors from the vegetables must be perceptible within the mixture, explained Alyssa Bakke, staff sensory scientist in Penn State's Department of Food Science, who spearheaded the research. She pointed out that the study was an effort to understand the sensory profiles of vegetable-containing, stage 2 infant products commercially available in the United States, and how ingredient composition affects flavor profiles.

In the study, recently published in *Appetite*, researchers performed descriptive analyses to quantitatively profile the sensory properties of 21 commercial vegetable-containing infant foods and one prepared in Hayes' laboratory. Eleven experienced adult panelists, after 14 1/2 hours of training, rated all 22 products—in triplicate—for 14 taste, flavor and texture attributes.

Panelists found that products containing fruit not only were sweeter than products that did not contain fruit but also were higher in fruit flavors and lower in vegetable flavors. In general, sensory profiles were driven by the first or majority ingredient in the product. Because few products had dark green vegetables as a first ingredient, dark green vegetable flavor was not prevalent.

"This suggests the sensory profiles of commercially available infant [vegetable](#) foods may not be adequate to facilitate increased acceptance of green vegetables," Bakke said. "This is a huge concern right now—how can we promote the liking of vegetables? From infants to adults, people tend not to like vegetables."

There are understandable reasons why vegetables are not preferred,

Bakke said. They tend to be more bitter than other foods, and they tend to have less intense, more subtle flavors than most other foods. Sensory attributes that, unfortunately, are innate drivers of liking, she said, are salt and fat.

"Vegetables, of course, just don't have those things, so we have to learn to like them, and sometimes we have to overcome things like bitterness," she said. "The number one way we do that is just repeated trial—trying it over and over and over again. If this is done early on, we can prepare people to have a liking for vegetables throughout their whole lifetimes."

More information: Alyssa J. Bakke et al. Blending dark green vegetables with fruits in commercially available infant foods makes them taste like fruit, *Appetite* (2020). [DOI: 10.1016/j.appet.2020.104652](https://doi.org/10.1016/j.appet.2020.104652)

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