The glycemic index may be counterproductive for helping Americans adopt healthier diets

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Today, many people struggle to make healthy food and beverage choices in line with the Dietary Guidelines for Americans (DGA). In fact, the

average American under-consumes nutrient-dense fruits, vegetables, whole grains, beans and dairy foods—and more than half of American adults have at least one diet-related chronic disease.

To improve overall diet quality, Jill Nicholls, Ph.D., asserts in a recently published perspective in *Frontiers in Nutrition* that people need tools that are relevant, reliable and applicable—and evidence suggests the glycemic index (GI) falls short on all of the above.

"The GI is increasingly used and interpreted as a measure of overall carbohydrate food quality, with some proponents advocating for its broader adoption as a public health tool. However, the GI model doesn't address nutrient density or translate well to healthy dietary patterns, and its narrow focus on just one dimension of carbohydrate-containing foods may divert public attention away from approaches to improving health that are accessible, affordable, culturally appropriate and environmentally sustainable," stated Nicholls, owner of Food Context, LLC. "At best, it's an incomplete gauge of carbohydrate food quality. At worst, it may be counterproductive to achieving the dietary recommendations set forth in the DGA."

Intended for people with type 1 diabetes, not the general public

Developed in the 1980s as a blood glucose management tool for people with type 1 diabetes, the GI is a comparative measure of glycemic impact. The GI measures the ability of the available carbohydrate in a food to increase blood glucose. It is determined by measuring blood glucose after consuming 50 grams of carbohydrate from a single test food and normalizing to a comparable portion of a control food, typically pure glucose or white bread.

Carbohydrate-containing foods are quite varied and make important contributions to dietary patterns, yet the GI measures only glucose response. It does not account for overall nutrient content, and research has shown it may not be an accurate predictor of overall diet quality. And because low-GI foods are not necessarily high in essential nutrients, over-reliance on GI values may lead to food choices that are inconsistent with current dietary guidelines. Energy-dense choices such as ice cream and candy bars, for instance, can have low GI values, while nutrient-dense choices that support healthy dietary patterns can also be high-GI foods, including carrots, potatoes and grains.

An unreliable and highly individualized measure of glycemic response

"The reliability of the GI has been scrutinized since its introduction more than 40 years ago, including critiques about methodology and questions about the relationship between a food's GI value and true post-meal glycemic response," said Nicholls.

Because GI values are calculated based on foods consumed in isolation and analyzed under standard laboratory conditions, their real-world application may be limited. "Under the GI model, fat, protein and fiber are treated as entirely independent variables, but that assumption is at odds with current views about our understanding of how eating patterns influence health based on all food and beverage contributions," Nicholls explained.

Much of the research has demonstrated significant variability in both inter- and intra-individual glycemic responses to the same food. Thus, it remains unclear whether the GI is a property of foods or a characteristic of each unique individual consuming those foods. Emerging studies have found that glycemic responses are more similar within individuals than

between them, and an array of factors in addition to meal composition can influence individual carbohydrate metabolism, including, meal timing, physical activity and sleep habits.

A questionable predictor of health outcomes

Research also indicates that the GI may not be the best carbohydrate food quality metric to assess diets and chronic disease prevention. In a landmark series of systematic reviews and meta-analyses, Reynolds et al. found that the association between the GI and risk of non-communicable diseases was low to very low compared to fiber or whole grains. Meanwhile, the dietary patterns emphasized in the DGA contain more whole grains and fiber-containing foods than Americans usually eat, along with higher amounts of fruits, vegetables, and dairy foods. These patterns are associated with lower risk for NCDs. Eating nutrient-dense whole foods as part of balanced meals during the day is an easy way to improve glycemic responses and improve diet quality without monitoring the GI of foods.

"The Mediterranean Diet is one example of a dietary pattern that has been associated with reduced disease risk; yet, not every food in a Mediterranean eating pattern is low GI," Nicholls added. In addition, clinical trials have shown compelling evidence that high GI foods eaten within the context of high-quality dietary patterns can yield improvements in cardiovascular disease risk factors, and weight loss regimens may be less reliant on glycemic responses than expected.

"Evidence increasingly suggests that it's the total diet that counts. Improving the overall quality of an individual's dietary patterns can have beneficial effects on a variety of diet-related chronic disease, but the effect of any single food choice is mediated by the other foods and beverages eaten, physical activity and other lifestyle choices. While the GI may illuminate some narrow insights, it also keeps many of these

relevant variables in the dark."

More information: Jill Nicholls, Perspective: The Glycemic Index Falls Short as a Carbohydrate Food Quality Indicator to Improve Diet Quality, *Frontiers in Nutrition* (2022). DOI: 10.3389/fnut.2022.896333

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