Cracking the carb code: Researchers create new glycemic index database to improve dietary awareness

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BYU researchers used AI to create a new glycemic index to help improve public health. Credit: Christi Norris

Karen Della Corte, BYU nutrition and dietetics professor, recently

authored a new study, published in *The American Journal of Clinical Nutrition*, that developed a national glycemic index (GI) and glycemic load (GL) database to offer insights into the evolving quality of carbohydrates consumed in the United States, something that hadn't been done previously.

The GI is a scale used by public health researchers to categorize the quality of the carbohydrates. High-GI foods like white flour and sugar cereals cause a "sugar rush" that can negatively impact metabolic health. Additionally, GL factors in the quantity of carbohydrates consumed.

"Large-scale studies have shown that both high GI and GL diets are associated with an increased risk of Type 2 diabetes, cardiovascular disease, and some cancers," said Della Corte. "In addition, high-GI foods lead to quicker hunger and increased caloric intake and contribute to weight gain."

To conduct the study, Della Corte and her husband, Dennis Della Corte, a BYU professor of physics and astronomy, developed an AI-enabled model that analyzes foods based on their GI and GL. They used the National Health and Nutrition Examination Survey (NHANES) which provided a sample list of foods Americans eat daily. The AI matched the foods from the NHANES, based on the food descriptions, with their correlated GI/GL values. This created the first national GI database.

"Using open AI for the [creation] of the GI database was a novel application of ours and marks an advancement in nutritional research methodology," said Della Corte. "Looking forward, many new and important questions can now be investigated using this database relating to the role GI and GL play in chronic disease risk in the U.S."

This dietary database allowed Della Corte to analyze the carbohydrate intake from the data they collected from nearly 10,000 foods. A process

which could have taken months was sped up and made possible using AI.

In addition to developing the methodology needed for the creation of the first national GI database in the U.S., their work includes the analysis of carbohydrate quality intake trends spanning over two decades. It reports on the top GL-contributing foods to the American diet, such as soft drinks, white bread, rice and fruit juice.

"One key takeaway from this study is the importance of prioritizing low-glycemic carbohydrates in the diet. This means focusing on whole, minimally processed foods that release glucose slowly into the bloodstream and prevent spikes in blood sugar levels," said Della Corte. "Making swaps from refined grains to whole grains can help improve the healthfulness of the diet and lower the overall dietary GI."

Della Corte notes that having a simple understanding of what foods are low on the glycemic index can help people make more informed food choices. Think of it as turning your pantry into a "GI-friendly zone." She suggests adding the following items to your grocery list or including some of them in weekly meal prep:

- Whole grains
- Beans
- Lentils
- Chickpeas
- Brown or wild rice
- Quinoa
- Barley
- Steel-cut or rolled oats
- Non-starchy vegetables
- Fruits
- Nuts

Additionally, the study found dietary patterns within GI and GL based on sex, race, ethnicity, education, and income levels. Not surprising, as individuals aged, they tended to make healthier carbohydrate choices. Those with a higher education and income were more likely to eat foods with lower GI. Black adults have the highest GI/GL and women have higher GI/GL than men.

The Della Cortes say they've enjoyed collaborating on this research and hope their database leads to increased public awareness of the importance of carbohydrate quality, which along with other important lifestyle factors could help prevent disease and extend an individual's health span.

"We hope that future studies derived from this database will add to the body of evidence needed to advocate for the incorporation of GI into public health guidelines and dietary recommendations."

In addition to the Della Cortes, BYU undergraduate student Sean Titensor and Dr. Simin Liu from Brown University also contributed to this research.

More information: Karen A Della Corte et al, Development of a national database for dietary glycemic index and load for nutritional epidemiologic studies in the United States, *The American Journal of Clinical Nutrition* (2024). DOI: 10.1016/j.ajcnut.2024.06.001

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