

Graphical display of nutrition information helps keep health-conscious eaters on target

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Diseases such as obesity, diabetes, and heart disease can often be prevented or treated by managing the intake of certain nutrients. However, in a time-constrained situation, such as standing in line at a cafeteria or restaurant, it can be difficult for consumers to quickly calculate and use numerical nutrition information—beyond the amount of calories—provided for menu items.

A new study from the University of Illinois found that when consumers are shown a graphical display of select nutrients on a 2-dimensional plot when ordering in a café setting, they purchase healthier, not just lower-calorie, menu items as a meal.

Manabu T. Nakamura, an associate professor of nutrition at U of I, said understanding how to best present [nutrition information](#) is an important, new area of research for him and his lab. "We have researched how fats or carbs metabolize and are regulated, for example. Based on this kind of research, the message of what nutrients we should eat is pretty set. The important thing is learning how you select the right foods. We need to provide a way to communicate what foods to select for certain health problems.

"Current nutrition labels provide comprehensive nutrient information, but unfortunately they're not working for consumers to help them make decisions in restaurants and grocery stores," he said.

As part of the Affordable Care Act, chain restaurants and retail food establishments with 20 or more locations are required to provide nutrition information for menu items. But Nakamura said most people, except those who have specific health concerns or food allergies, don't ask to see this information or don't know how to use the

information provided.

Previous research has been done showing that a "traffic light" labeling system in which menu items are designated as green, yellow, or red based on [calories](#) had some effect on diners' choice of foods. But Nakamura explained that even that system had no effect on consumers' purchases when multiple nutrients are color coded.

In order to see if presenting the nutrition information graphically would change diners' purchasing behavior, Nakamura, along with doctoral student, Nathan Pratt, and a team of other researchers set up two experiments using a visual, 2-dimensional plot showing the values of fiber and protein per calorie for each menu item. The graph also includes a target box that represents the recommended dietary amounts of those nutrients per calorie of food.

The researchers chose to plot fiber and protein per calorie values because these two nutrients are closely tied to weight management. Fiber has been linked to greater satiety and lean protein has been linked to improving body fat loss. "Promoting fiber intake is important. It could help in preventing overeating. Only 10 percent of the U.S. population meets the fiber recommendation. So there's a long way to go."

"Most people would agree that these are two nutrients most relevant for managing weight," Nakamura said. "Of course sodium, saturated fat, and all vitamins and minerals are also important for overall health. But we had to limit the number of nutrients in order to have an impact on decision making in a time-constrained condition."

He added that other combinations of nutrients, depending on specific dietary needs, could also be

plotted using the graph.

The team began with an experiment to see how well participants could recall nutrition information when shown the information for foods either using the 2-dimensional graph or numerical information. The participants were then asked to recall the information. Recall accuracy improved by up to 43 percent when they were shown the information graphically versus numerically.

The second experiment was a 12-week study of purchasing behavior in U of I's Bevier Café. In this setting customers stand in line to order and pay for their food at registers near the entrance of the café.

During some weeks of the study, menu items were plotted either on the 2-dimensional graph according to their fiber, protein, saturated fat, and sodium per calorie values with the information signposted where customers could see before ordering, or other weeks, nutrition information was displayed numerically. Facts about managing a healthy weight, such as keeping calories in a healthy range, limiting saturated fat and sodium, and increasing fiber and protein was also signposted near where food was ordered.

How did having a visual target to shoot for when ordering a meal work for consumers?

Ultimately, when nutrition information was provided on the 2-dimensional graph, consumers purchased fewer calories, but purchased more protein per calorie and more items that were rated high as healthy on the plot. Nakamura calls this a "clear success."

"This may be the first study that shows unambiguous purchasing changes from displaying the nutrition information," he said.

During the weeks in which nutrition information was displayed graphically, calories purchased from entrees decreased by 10 percent compared to when no information was displayed, and decreased by 13 percent compared to when numerical information was provided. During the graphical stage, calories from side items purchased decreased from 43 percent compared to when no

label was displayed, and 47 percent from the numerical stage.

Protein per calorie increased by nearly 24 percent when the graph was present compared to when no nutrition label was provided, and 20 percent from the numerical stage.

"If you are looking at just calories when choosing food, that's not enough. If you stop eating something, you can certainly reduce calorie intake. But the important thing is that you when you make your meal healthy, it's not just about calories, you have to think about other nutrients, too," Nakamura said. "In terms of weight maintenance, you can reduce calories but increase the protein per calorie and the same with fiber, a fiber per calorie increase. These two things have to be maintained or it's a bad diet that you can't maintain."

In the future, the researchers hope the graph can be used to present nutrition information in restaurants, grocery stores, and dining halls, as well as in households for recipe analysis. Nakamura said future studies on this graphical method may look at more diverse populations, menus that offer a greater variety in fiber offerings, and more nutrient combinations.

Another possibility Nakamura is excited about is the possibility of creating mobile apps with the graph that consumers can use to plot nutrients in menu items as they order during time-constrained situations.

"We are hoping this system can be quickly understood and can provide the information needed to make a decision," Nakamura said.

"Improvements in recall and food choices using a graphical method to deliver information of select [nutrients](#)" was published in *Nutrition Research*. Co-authors include Nathan S. Pratt, Brenna D. Ellison, Aaron S. Benjamin, and Manabu T. Nakamura, all of the University of Illinois.

Provided by University of Illinois at Urbana-Champaign

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