Food label nutrition facts matter to you, but don't tell you much about your gut microbes

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Credit: Nataliya Vaitkevich from Pexels

It seems like every day a new study is published that links the bacteria in the gut to a specific disease or health condition. The allure of research like ours and that of other groups is that it might eventually be possible

to give personalized recommendations for what specific foods to eat to shift your bacteria in a direction that improves your health.

To understand how individual foods change the bacteria that live inside the human gut, collectively known as the microbiome, we need to know the microscopic makeup of each food we eat. But that data isn't available on food labels or in any current nutritional databases.

This lack of detail has been a limitation in understanding specific food-microbe relationships in humans to date. As a registered dietitian and nutrition scientist, I've had a longstanding interest in foods and human health. When I joined a computational research lab studying the microbiome, I was interested to learn if it would be possible to predict how foods changed the microbiome if we simply gathered a enough daily data from a group of people eating their normal diets.

Learning from 500 stool samples

In our recent study, published in *Cell Host & Microbe*, our research group studied the effect of foods on the microbiome. We recruited 34 volunteers and asked them to record everything they ate during a 17-day period and to also provide daily stool samples. By analyzing the microbial DNA in the stool samples, we were able to see what species made up their microbiome.

We found that the nutritional content of our subjects' diets—the macro- and micronutrients like what is usually shown on a food label, such as fats, carbohydrates and sodium—didn't help us to understand the microbial communities or how they changed from day to day.

But, when we considered the specific foods they ate, we could connect our subjects' dietary intake to their microbiome composition. We think that this worked because our method let us use the concept of a food to

capture some of the complexity of the compounds inside that food that are not usually listed on a food label.

We believe it is noteworthy that the the effects of foods were very personalized—meaning that we saw the same species of microbes respond differently to similar foods in different people.

I am hopeful that in the near future we will be able to confidently tell you what foods will change your microbiome. As a whole, microbiome science is not able to confidently do that just yet, but our recent study contributes towards that long-term goal.

More information: Abigail J. Johnson et al. Daily Sampling Reveals Personalized Diet-Microbiome Associations in Humans, *Cell Host & Microbe* (2019). DOI: 10.1016/j.chom.2019.05.005

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