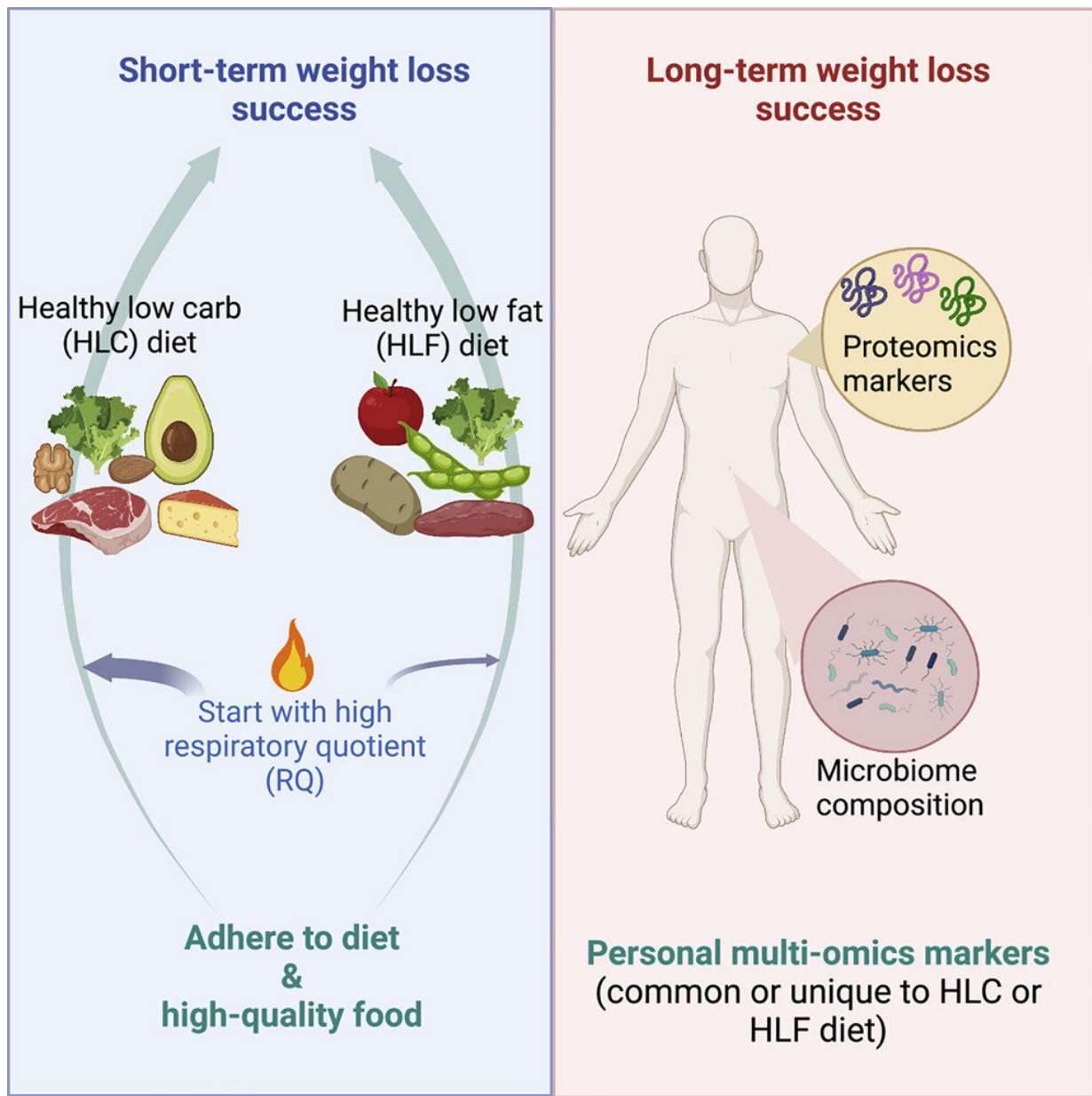


Biomarkers predict weight loss, suggest personalized diets

January 12 2023, by Kimberlee D'Ardenne



Graphical abstract. Credit: *Cell Reports Medicine* (2022). DOI: 10.1016/j.xcrm.2022.100870

A new analysis of data from a year-long weight-loss study has identified behaviors and biomarkers that contribute to short- and long-term weight loss.

Strictly following a [diet](#)—either healthy low-carb or healthy low-fat—was what mattered for short-term [weight](#) loss during the first six months. But people who maintained long-term weight loss for a year ate the same number of calories as those who regained weight or who did not lose weight during the second six months.

So what explains this difference?

According to the study, the bacteria living in your gut and the amounts of certain proteins your body makes can affect your ability to sustain weight loss. And some people, it turned out, shed more pounds on low-fat diets while others did better on low-carb diets.

Stanford Medicine researchers have identified several biomarkers that predict how successful an individual will be at losing weight and keeping it off long-term. These biomarkers include signatures from the [gut microbiome](#), proteins made by the [human body](#) and levels of exhaled carbon dioxide. The researchers published their findings in *Cell Reports Medicine* on Dec. 13.

"Weight loss is enigmatic and complicated, but we can predict from the outset with microbiome and metabolic biomarkers who will lose the most weight and who will keep it off," said Michael Snyder, Ph.D., professor and chair of genetics and co-senior author on the paper.

Willpower does not drive weight loss

The data came from 609 participants who logged everything they ate for a year while following either a low-fat or [low-carb diet](#) made up of mostly high-quality, minimally processed foods. The researchers tracked participant exercise, how well they followed their diet, and the number of calories consumed.

The study showed that just cutting calories or exercising were not enough to sustain weight loss over a year. To try to understand why, the team turned their focus to biomarkers of metabolism.

"We found specific microbiome ecologies and amounts of proteins and enzymes at the beginning of the study period—before people started following the diet—that indicated whether they would be successful at losing weight and keeping it off," said Dalia Perelman, research dietician and co-lead author on the paper.

Throughout the study, the researchers measured the ratio of inhaled oxygen to exhaled carbon dioxide, known as a respiratory quotient, which serves as a proxy for whether carbohydrates or fats are the body's primary fuel. A lower ratio means the body burns more fat, while a higher ratio means it burns more carbohydrates. So, those who started the diet with a higher respiratory quotient lost more weight on a low-carb diet.

"There are people who can be eating very few calories but still sustain their weight because of how their bodies metabolize fuels. It is not for lack of will: It is just how their bodies work," Perelman said.

In other words, if your body prefers carbs and you're predominately eating fat, it will be much harder to metabolize and burn off those calories.

"If you are following a diet that worked for someone you know and it is not working for you, it might be that that specific diet is not as suited for you," added Xiao Li, Ph.D., co-lead author of the paper, a former postdoctoral fellow at Stanford Medicine who is now at Case Western University.

For now, focus on nutrients

The predictive information gleaned from the gut microbiome, proteomic analysis and respiratory quotient signatures is laying the foundation for personalized diets. Snyder said he thinks tracking amounts of certain gut microbe strains will be a way for people to determine which diets are best for weight loss.

We're not there yet, so until then, according to the researchers, the focus should be on eating high-quality foods that are unprocessed and low in refined flours and sugar.

The research team identified specific nutrients that were correlated with [weight loss](#) during the first six months. Low-carb diets should be based on [monounsaturated fats](#)—such as those that come from avocados, rather than bacon—and high in vitamins K, C and E. These vitamins are in vegetables, nuts, olives, and avocados. Low-fat diets should be high in fiber, such as is found in whole grains and beans, and avoid added sugars.

"Your mindset should be on what you can include in your diet instead of what you should exclude," Perelman said. "Figure out how to eat more fiber, whether it is from beans, whole grains, nuts or vegetables, instead of thinking you shouldn't eat ice cream. Learn to cook and rely less on processed foods. If you pay attention to the quality of food in your diet, then you can forget about counting calories."

More information: Xiao Li et al, Distinct factors associated with short-term and long-term weight loss induced by low-fat or low-carbohydrate diet intervention, *Cell Reports Medicine* (2022). [DOI: 10.1016/j.xcrm.2022.100870](https://doi.org/10.1016/j.xcrm.2022.100870)

Provided by Stanford University

Citation: Biomarkers predict weight loss, suggest personalized diets (2023, January 12) retrieved 24 November 2023 from <https://medicalxpress.com/news/2023-01-biomarkers-weight-loss-personalized-diets.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.