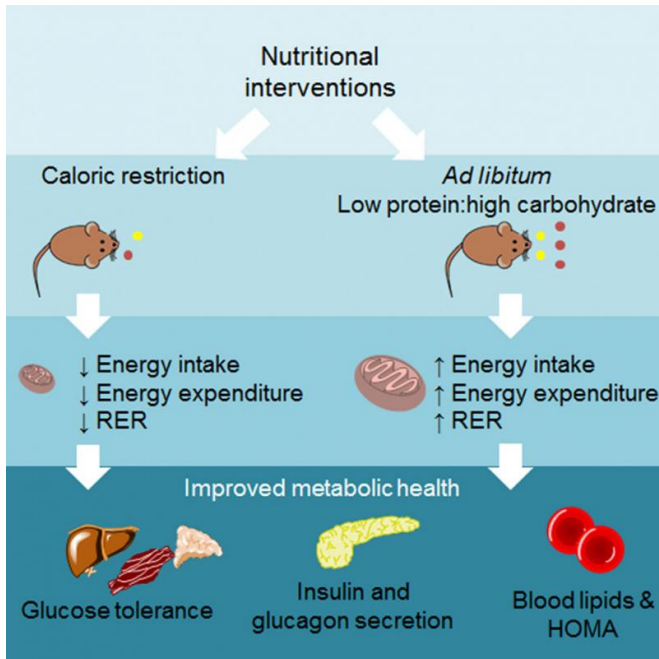


Benefits of calorie restriction on par with balancing protein and carb intake in mice

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Solon-Biet et al. find that short-term ad libitum lowprotein, high-carbohydrate diets improve levels of insulin, glucose, lipids, and HOMA. LPHC diets under ad-libitumfed conditions generate the metabolic benefits of caloric restriction without a 40 percent reduction in total caloric intake. Credit: Solon-Biet et al./*Cell Reports* 2015

Cutting calories through dietary restriction has been shown to lower cholesterol, improve insulin sensitivity, and even prolong life in mammals. Now, new research publishing on May 28th in *Cell Reports* shows that, at least in mice, low protein, high carbohydrate diets can provide benefits similar to those obtained with calorie restriction.

"We've shown that when compared head-to-head, [mice](#) got the same benefits from a low protein, [high carbohydrate diet](#) as a 40% caloric restriction diet," says senior author Stephen Simpson, Academic Director of the University of Sydney's Charles Perkins Centre. "Except for the fanatical few, no

one can maintain a 40% caloric reduction in the long term, and doing so can risk loss of bone mass, libido, and fertility."

The investigators compared three 8-week diets varying in protein-to-carbohydrate ratio under conditions where food was restricted or food was available at all times. Of the three, low protein, high carbohydrate (LPHC) diets offered when food was always available delivered similar benefits as [calorie restriction](#) in terms of insulin, blood sugar, and cholesterol levels, despite increased food intake.

Even though the mice on LPHC diets ate more when food was always available, their metabolism was higher than that of mice on the calorie-restricted diet, and they did not gain more weight. Calorie restriction did not provide any additional benefits for LPHC mice.

Additional research is needed to determine how LPHC diets affect long-term metabolic health and survival, as well as to what extent the type and quality of proteins and carbohydrates matter. "An important next step will be to determine exactly how specific amino acids, the building blocks of proteins, contribute to overall health span and lifespan," says lead author Samantha Solon-Biet, also of the Charles Perkins Centre.

If the study's results apply to humans, adjusting protein and carbohydrate intake could lead to healthier aging in a more realistic manner than drastically cutting [calories](#). "It still holds true that reducing food intake and body weight improves metabolic health and reduces the risk of diseases like type 2 diabetes, obesity, and fatty liver disease," says Simpson. "However, according to these mouse data and emerging human research, it appears that including modest intakes of high-quality protein and plenty of healthy carbohydrates in the diet will be beneficial for health as we age."

More information: *Cell Reports*, Solon-Biet et al.:
"Dietary protein to carbohydrate ratio and caloric
restriction: comparing metabolic outcomes in mice"
[dx.doi.org/10.1016/j.celrep.2015.05.007](https://doi.org/10.1016/j.celrep.2015.05.007)

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