

# Low-protein high-carb diet shows promise for healthy brain aging

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Low-protein high-carbohydrate diets may be the key to longevity, and healthy brain ageing in particular, according to a new mice study from the University of Sydney.

Published today in *Cell Reports*, the research from the University's Charles Perkins Centre shows improvements in overall health and [brain](#) health, as well as learning and [memory](#) in mice that were fed an unrestricted low protein high carbohydrate [diet](#).

"There are currently no effective pharmaceutical treatments for dementia—we can slow these diseases, but we can't stop them—so it's exciting that we are starting to identify diets that are impacting how the brain ages," said lead author and Ph.D. candidate Devin Wahl.

The research shows for the first time that unrestricted low-protein, high-carbohydrate diets have similar protective benefits for the brain as calorie restriction, which is well known for its longevity benefits although not sustainable in humans.

"We have close to 100 years of quality research extolling the benefits of [calorie restriction](#) as the most powerful diet to improve [brain health](#) and delay the onset of neurodegenerative disease in rodents," said Mr Wahl.

"However, the majority of people have a hard time restricting calories, especially in Western societies where food is so freely available.

"It shows a lot of promise that we have been able to replicate the same kind of gene changes in the part of the brain responsible for memory that we also see when we severely restrict calories," said Mr Wahl.

Low-protein high-carbohydrate diets are by no means a new fad.

Senior author Professor David Le Couteur said numerous cultures including the people of Okinawa in Japan and many parts of the Mediterranean have long observed this mix. "The traditional diet of Okinawa is around nine percent protein, which is similar to our study, with sources including lean fish, soy and plants, with very little beef.

Interestingly, one of their main sources of carbohydrate is sweet potato," said Professor Couteur, Professor of Geriatric Medicine at the University of Sydney.

For the current study, researchers fed the mice complex carbohydrates derived from starch, and casein protein which is found in cheese and milk.

To assess the brain benefits of the diet the researchers focused on the hippocampus, the region of the brain responsible for learning and memory.

"The hippocampus is usually the first part of the brain to deteriorate with neurodegenerative diseases like Alzheimer's. However, the low-protein [high-carbohydrate diet](#) appeared to promote hippocampus health and biology in the mice, on some measures to an even greater degree than those on the low-calorie diet," said Professor Couteur.

Learning and memory was assessed via a series of spatial awareness and memory tests, with researchers noting modest improvements in male and female mice at both young and old ages.

This research follows a landmark 2015 study from the University of Sydney's Charles Perkins Centre that showed low protein, high carbohydrate diets could be just as effective as low calorie diets in promoting a long life in [mice](#) through good heart and digestive health.

**More information:** *Cell Reports* (2018). [DOI: 10.1016/j.celrep.2018.10.070](https://doi.org/10.1016/j.celrep.2018.10.070)

Provided by University of Sydney

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