

# Vitamin D in diet might ease effects of age on memory, study suggests

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If you don't want to dumb down with age, vitamin D may be the meal ticket. A boosted daily dosage of the vitamin over several months helped middle-aged rats navigate a difficult water maze better than their lower-dosed cohorts, according to a study published online Monday in the journal *Proceedings of the National Academy of Sciences*.

The supplement appears to boost the machinery that helps recycle and repackage signaling chemicals that help neurons communicate with one another in a part of the brain that is central to memory and learning.

"This process is like restocking shelves in grocery stores," said study co-author Nada Porter, a biomedical pharmacologist at the University of Kentucky College of Medicine.

Neurons also are better able to receive and process those signals in ways

that are connected with [memory formation](#) and retrieval, the study found.

The improvements in memory were associated with a level of a vitamin D metabolite that is about 50 percent higher than the one recommended by the Institute of Medicine to maintain healthy bones, but in line with what other experts recommend, according to Porter.

Medical science has been expanding its view of the vitamin's role beyond bone structure, linking deficiencies to higher risks of cancer and other diseases, as well as to higher rates of cognitive decline in the elderly. But medical panels and researchers have questioned those studies and cast doubt on the value of vitamin D supplements. Several [randomized controlled trials](#) have been launched to try to resolve those questions.

The vast majority of the vitamin D in our bodies is created in the skin from a naturally occurring precursor molecule, with the help of UV light from the sun. Some foods, such as milk, are supplemented with the vitamin.

In the current study, researchers placed [rats](#) on six-month diets with low, medium and high levels of vitamin D3. Rats were tested on their ability to recall the location of a platform in a water maze, and then to recall a new location. It's the rodent equivalent of finding your car in your work parking lot after parking it in a new place.

"This was a more challenging task, and therefore more sensitive to the subtle changes in memory that occur with aging," Porter said.

Rats on the high dose reached the new platform more quickly and via shorter routes, compared with rats in the other groups, the study found. Paths traced by the low-dose rats looked like loopy kindergarten

scribbling, while those of the higher-dose rats were simpler, with few changes of direction.

Inside the hippocampus of the rats' brains, there were important changes in the activity of dozens of genes, notably those involving vesicles that transport neurotransmitters to the synapse, where they are released and picked up by adjacent neurons, the study found.

The hippocampus is critical to memory formation and consolidation, which is central to cognition. Studies involving the function of this area in rats have proved useful in understanding it in the human brain. But translating findings in rodent models still can be tricky.

The study makes no recommendation on dosages in humans, but it noted that there are few side effects to increased vitamin D intake, particularly in the D3 form. In rare cases, high doses of vitamin D can raise calcium levels in the blood, though no such rise was noted in the high-dosage rats, according to the study.

"Many factors influence vitamin D levels, and it's best for individuals to consult with their doctors before undertaking a specific [vitamin D](#) regimen," Porter said.

**More information:** "Vitamin D prevents cognitive decline and enhances hippocampal synaptic function in aging rats," by Caitlin S. Latimer et al. *PNAS*, [www.pnas.org/cgi/doi/10.1073/pnas.1404477111](http://www.pnas.org/cgi/doi/10.1073/pnas.1404477111)

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