

# Low vitamin D causes brain damage

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A new study led by University of Kentucky researchers suggests that a diet low in vitamin D causes damage to the brain.

In addition to being essential for maintaining bone health, newer evidence shows that vitamin D serves important roles in other organs and tissue, including the brain. Published in *Free Radical Biology and Medicine*, the UK study showed that middle-aged rats that were fed a diet low in vitamin D for several months developed [free radical](#) damage to the brain, and many different brain proteins were damaged as identified by redox proteomics. These rats also showed a significant decrease in cognitive performance on tests of learning and memory.

"Given that vitamin D deficiency is especially widespread among the elderly, we investigated how during aging from middle-age to old-age how low vitamin D affected the oxidative status of the brain," said lead author on the paper Allan Butterfield, professor in the UK Department of Chemistry, director of the Center of Membrane Sciences, faculty of Sanders-Brown Center on Aging, and director of the Free Radical Biology in Cancer Core of the Markey Cancer Center. "Adequate vitamin D serum levels are necessary to prevent [free radical damage](#) in brain and subsequent deleterious consequences."

Previously, low levels of vitamin D have been associated with Alzheimer's disease, and it's also been linked to the development of certain cancers and heart disease. In both the developed world and in areas of economic hardship where food intake is not always the most nutritious, vitamin D levels in humans are often low, particularly in the

elderly population. Butterfield recommends persons consult their physicians to have their vitamin D levels determined, and if low that they eat foods rich in vitamin D, take vitamin D supplements, and/or get at least 10-15 minutes of sun exposure each day to ensure that [vitamin D](#) levels are normalized and remain so to help protect the [brain](#).

**More information:** "Dietary vitamin D deficiency in rats from middle to old age leads to elevated tyrosine nitration and proteomics changes in levels of key proteins in brain: Implications for low vitamin D-dependent age-related cognitive decline." Keeney JT, Förster S, Sultana R, Brewer LD, Latimer CS, Cai J, Klein JB, Porter NM, Allan Butterfield D. *Free Radic Biol Med*. 2013 Jul 18;65C:324-334. [DOI: 10.1016/j.freeradbiomed.2013.07.019](#).

Provided by University of Kentucky

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