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PRINT ISSN : 0040-8891

The Bulletin of Tokyo Dental College

Vol. 49 (2008) , No. 4 :185-190

[\[PDF \(178K\)\]](#) [\[References\]](#)**Effects of Soft-diet Feeding on BDNF Expression in Hippocampus of Mice**[Tetsu Yamamoto](#)¹⁾, [Akihiko Hirayama](#)²⁾, [Nobuo Hosoe](#)³⁾, [Masaru Furube](#)⁴⁾ and [Shusuke Hirano](#)⁴⁾1) *Department of Physiology, Tokyo Dental College*2) *Laboratory of Radioisotopes, Tokyo Dental College*3) *Department of Internal Medicine, Toho University Sakura Medical Center*4) *The Nukada Institute for Medical and Biological Research*

(Received November 14, 2008)

(Accepted December 19, 2008)

Abstract: Our previous study showed that mice fed a soft diet after weaning had reduced synaptic connections in the hippocampal formation and impaired spatial learning ability after 3 months of age. We hypothesized that soft-diet feeding during development reduced levels of brain-derived neurotrophic factor (BDNF) protein in the hippocampus, resulting in lower synaptic densities in this region. Male pups of C57BL/6 mice were fed either a solid (hard-diet group) or powdered diet (soft-diet group), starting at weaning. Expression of BDNF protein in the hippocampus and cerebral cortex was evaluated quantitatively with enzyme-linked immunosorbent assay (ELISA) at 1, 3 and 6 months of age. Reduction in BDNF protein levels due to soft diet was detected markedly in the hippocampus of 3- and 6-month-old mice. On the other hand, a soft diet showed no significant effect on BDNF content in the cerebral cortex throughout the ages investigated. Immunohistochemistry of hippocampal formation in 3-month-old mice revealed that intensities of BDNF immunoreactivity in the dentate gyrus granule cell layer and CA1 and CA3 pyramidal cell layers appeared diminished in mice fed the soft diet compared with mice fed the hard diet. These results indicate that insufficient mastication activity during development reduces BDNF protein levels in the hippocampus and influences synaptic plasticity in this region.

Key words: [Mastication](#), [Synaptogenesis](#), [Neurotrophin](#)



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To cite this article:

Tetsu Yamamoto, Akihiko Hirayama, Nobuo Hosoe, Masaru Furube and Shusuke Hirano:
"Effects of Soft-diet Feeding on BDNF Expression in Hippocampus of Mice". The Bulletin of
Tokyo Dental College, Vol. **49**: 185-190 (2008) .

doi:10.2209/tdcpublication.49.185

JOI JST.JSTAGE/tdcpublication/49.185

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