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[J Nutr.](#) 1987 Mar;117(3):496-500.

## Influence of dietary magnesium on fluoride bioavailability in the rat.

[Cerklewski FL.](#)

### Abstract

A factorial experiment was conducted with weanling rats fed a purified diet to determine the influence of dietary magnesium (200, 500 or 2500 ppm) as the carbonate on fluoride bioavailability (2 or 10 ppm as sodium fluoride). After 6 wk, rats fed the lowest magnesium-containing diets had significant reductions of plasma and femur magnesium. Higher dietary fluoride prevented accumulation of calcium in the kidneys of magnesium-deficient rats. Rats fed the lowest magnesium-containing diets had significantly more fluoride in their femurs and molar teeth than other groups at both levels of fluoride, whereas rats fed diets containing 5 times normal magnesium had less fluoride in their femurs and molars. The magnitude of the magnesium effect was considerably greater in rats fed diets containing 10 ppm fluoride compared to 2 ppm, indicating a highly significant, level-dependent interaction between magnesium and fluoride. Five-day metabolic studies conducted during wk 3 and 6 showed that low dietary magnesium significantly enhanced fluoride absorption, whereas high dietary magnesium significantly reduced fluoride absorption. Fluoride retention values simply reflected absorptive changes, which indicates that the site of the interaction between magnesium and fluoride is at the intestinal level, most likely involving insoluble complex formation.

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