



ESSENTIALS OF HEALTH

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Dietary Zinc Intake Correlates with DNA Strength

At a Glance

Zinc is an essential mineral with a known role in maintaining DNA integrity. A recent study takes this a step further by confirming a correlation between dietary zinc intakes and DNA damage in healthy adult males.

Read more about this research below.

Zinc is an essential mineral with a known role in maintenance of DNA integrity. However, until recently, no human studies have directly examined the role of zinc status on DNA damage in healthy adults.

A study published in the August 2009 American Journal of Clinical Nutrition examined the effects of varying levels of zinc intake on DNA damage in healthy adult males. Nine healthy men with reported mean daily zinc intakes of 11 mg/day were subjected to three different dietary periods.

- Days 1-13 = baseline period (11 mg zinc/day)
- Days 14-55 = zinc depletion (0.6 mg zinc/day for 1 week, then 4 mg zinc/day for 5 weeks)
- Days 56-83 = zinc repletion (11 mg zinc/day for 4 weeks with 20 mg supplemental zinc for the first 7 days)

Blood samples were collected on days 1, 13, 35, 55, and 83, and three key metrics were analyzed (DNA damage in peripheral blood cells, plasma oxidative stress, and antioxidant defense biomarkers).

As expected, dietary zinc depletion was strongly associated with increased DNA breakage in peripheral blood cells (day 13 compared with day 55, $P < 0.05$). Additionally, zinc repletion reversed much of the observed DNA weakness (day 55 compared with day 83, $P < 0.05$). Plasma zinc concentrations were negatively correlated with DNA strand breaks during the entire zinc depletion period ($P = 0.006$).

This study provides strong evidence for dietary zinc intake being a critical factor in maintaining DNA integrity in humans.

Song Y, Chung CS, Bruno RS, Traber MG, Brown KH, King JC, Ho E. 2009. Dietary zinc restriction and repletion affects DNA integrity in healthy men. *AJCN* 90(2):321-8.

