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Inulin and oligofructose : their efficacy as prebiotic fibres in mineral absorption and bone health

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Lot of the scientific interest on functional foods is directed towards the use of inulin and oligofructose as ingredients to enhance calcium absorption. Over the past 10 years, experiments in animal models have repeatedly shown that inulin and oligofructose increase calcium availability. Long term beneficial effects of inulin and oligofructose in growing rats were demonstrated by accumulation of bone mineral and improved structure of the trabecular network.. These experimental data about the effects of inulin and oligofructose for improving bone health in animal models support the hypothesis that increased calcium absorption might also positively influence peak bone mass in humans, especially during adolescence. Studies in adolescent boys confirmed this hypothesis by demonstrating an increase (> 25 %, $p < 0.05$) in their true fractional calcium absorption after ingestion of 15 g OF per day (1). Subsequent studies on calcium availability using similar methodologies e.g. stable isotopes showed corresponding effects. In girls with adequate calcium intakes, 8 g daily of a oligofructose-enriched inulin, increased their true absolute calcium absorption by almost 20 % (2). More detailed study on the subject characteristics revealed that those girls with lower calcium absorption at baseline showed the greatest benefit by Oligofructose-enriched inulin - supplementation (3). Recently, data from a long term prospective study focused on the changes in mineral accretion in 100 pre-pubertal girls and boys after 1 y again showed a significant increase in the calcium absorption after 2 months and this effect lasted during the whole year of the intervention (4). This resulted in a significant increase in the bone mineral density and the bone mineral content of the active group vs. the placebo ($P<0.05$). Data from this long term prospective study will be presented and the implications for relating health claims discussed. The benefits of this improved calcium absorption for postponing osteoporosis were further demonstrated in post-menopausal women. The absorption of Ca, Mg and biomarkers related to Ca absorption and bone formation were monitored. Emerging data on other health aspects include biomarkers related to immune modulation and appetite/satiety control. (1) Van den Heuvel et al. (1999) Am. J. Clin. Nutr. 69: 544-548. (2) Griffin et al. (2002) Brit. J. Nutr. 87 (S2): S187-S191. (3) Griffin et al. (2003). Nutr. Res. 23: 901-909. (4) Abrams et al. (2005) Am J. Clin. Nut. 82 471-6.