



Uptake and retention of calcium, iron, and zinc from raw legumes and the effect of cooking on lentils in Caco-2 cells

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Abstract

This study examined calcium, iron, and zinc uptake in Caco-2 cells (retention plus transport) from white beans, chickpeas, and lentils subjected to prior in vitro gastrointestinal digestion and the effect of cooking (traditional and industrial—ready to eat) on the uptake of these minerals from lentils. The highest cell uptake of calcium, iron, and zinc corresponded to raw chickpeas, which had the lowest soluble oxalate content and intermediate phenolic and tannin contents. From these results, raw chickpeas would be the best dietary source of calcium, iron, and zinc, although consumption in this form (ie, raw) is low. Cooking affects the calcium, iron, and zinc contents of lentils and their solubility and also the contents of components that can affect mineral solubility; however, these changes exerted only favorable effects on total cell uptake of calcium from ready to eat lentils, with negative effects in the case of iron and zinc.