

Role of FOS in Nutrient Absorption

- FOS are prebiotic, non-digestible, bifidogenic, naturally occurring oligosaccharides, also known as fructans or oligofructose.
- Many of these carbohydrates are found in normal diet and are present in large amounts in garlic, Jerusalem artichoke and chicory root.

Short or medium chain units of fructose

Terminal glucose unit linked in a β position

As they cannot be **metabolized by enzymes**, they reach the colon

In the colon they undergo fermentation by **beneficial bifidobacteria**¹

“Short Chain Fatty Acids (SCFA) are by products of bacterial fermentation, which have many health benefits, mineral absorption is one of them.”¹

Mineral Absorption: ^{1, 2, 3}

Proposed mechanisms by which FOS, improve mineral absorption

Production of SCFA lowers pH of gut lumen < 7 which enhances mineral absorption

Trophic effect of SCFA on enterocytes, increasing surface area of absorption

Increased folate production with increased production of Bifidobacterium.

Gut bacteria produce SCFA along with various vitamins like B3, B5, B6, B12, vitamin k, biotin and tetrahydrofolate which facilitates mineral absorption

Studies which demonstrate the beneficial effect of FOS on mineral absorption:

- Castro et. al, conducted a study on...

Age: 2–5-year-old children

Parameters assessed: Investigated the effect of 30 gm inulin with minerals like iron, zinc, copper and vitamins A and C.

Results obtained: After intervention the values were higher for z scores for height and weight, erythrocytes, haemoglobin, mean corpuscular volume, mean corpuscular haemoglobin and ferritin.⁴

- In a study by Drabińska N et al...

Intervention: Children with celiac disease were supplemented with oligofructose - enriched inulin 10g per day.

Results obtained: Vitamin D & Vitamin E status was higher and Vitamin D levels reached optimal 46% in supplemental children.⁵

- Yap, K.W., et al.

Showed that a significant increase in **percent apparent absorption, retention and net retention of minerals like iron and zinc** were seen in formula fed infants supplemented with different doses of inulin.

Absorption of divalent cations is facilitated by the good gut bacteria which proliferate in the presence of FOS.

The growth of the beneficial bacteria and its metabolites (SCFAs) are mainly responsible for imparting the beneficial effects like mineral absorption.¹

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