THINK ZINC

The Power of Zinc for Human Health

Factors Involved in Zinc Absorption

Zinc is an essential trace element, but its uptake in humans can be hindered by dietary factors, other minerals and the source of zinc.

For the human body to function normally, it is all about balance and cellular health. In the case of zinc, we want to maintain homeostasis or a constant state of cellular zinc nutrition. The uptake of zinc from food and supplements takes place in the gastrointestinal tract in the proximal small intestine and is regulated by zinc-buffering proteins such as metallothioneins (MTs) and intracellular transporters (ZIP4 transporter). The genes associated with this transporter are upregulated in periods of dietary zinc restriction, making it a powerful way to control homeostasis (1). But the uptake of zinc is influenced, and can be disrupted by a variety of other external factors, which can lead to reduced absorption or an increased excretion of the mineral.

Zinc absorption can be influenced by the human diet.

Dietary Factors and Zinc

Zinc absorption can be influenced by the human diet. Phytic acid or phytase from nuts, edible seeds, beans/legumes and grains can reduce zinc availability, as they naturally store phosphorus as phytic acid. The amount of phytic acid in these foods varies widely. Phytic acid has beneficial antioxidant properties but is also referred to as an ‘anti-nutrient’ because it binds zinc and other trace minerals in the gastrointestinal tract when absorbed during a meal. This can decrease the absorption and bioavailability of zinc.

Another dietary factor to consider is sugar. In the US, sugar is commonly consumed in the form of high fructose corn syrup (HFCS), which is used to sweeten food and drinks. In 2021, the estimated yearly per capita consumption of sugar in the US was 69.8 pounds, of which 39.5 pounds consisted of HFCS. Research (2) in young adults who consume beverages sweetened with glucose, fructose, HFCS or aspartame for two weeks showed that sugar consumption negatively affected zinc and copper metabolism parameters within the trial period.

Other Blocking Agents for Zinc

There are more agents that can decrease zinc absorption (1) such as calcium supplements used to prevent osteoporosis or water naturally high in calcium and copper supplements. Each has an antagonistic relationship with zinc (3,4). Research has shown decreased zinc absorption when different forms of calcium have been ingested following a zinc dose, suggesting an antagonistic relationship between the minerals. Ingestion of high iron concentrations might also affect zinc uptake (5,6). Folic acid has been shown to increase fecal zinc losses, indicating decreased zinc absorption (7). In addition, it is suggested that drug interactions with zinc can also decrease absorption or cause its excretion. One widely used drug is proton pump inhibitors used to treat acid reflux disease by lowering stomach acid levels. According to one study, patients taking proton pump inhibitors showed a marked increase in zinc deficiency, from 16% to 50% within two months, upon starting treatment with the drug (8).

Preventing a Zinc Deficiency

The uptake of zinc from the gastrointestinal tract to the bloodstream is regulated by the human body. However, there are factors that can hinder or block absorption of zinc, which can lead to a depressed immune system and higher risk for infection. For example, vegetarians and vegans that consume plant-based diets should be aware of the anti-nutrient effects of phytic acid rich foods on zinc levels. For groups with a higher mineral need, such as men over 40, pregnant or breastfeeding women, it is also important to keep dietary factors in mind to make sure that zinc deficiency is prevented. In all the above deficiency examples, zinc supplementation can be recommended to replenish zinc levels.

Why Choose Zinc from Zinpro®?

When deciding on which supplement to take, it is important to choose a source that can be easily absorbed by the human body. Zinc amino acid complexes are more stable in the gastrointestinal tract, which results in better absorption (bioavailability) than their inorganic counterparts. For over 52 years, Zinpro has been a pioneer in the research and development of performance trace minerals and innovative nutritional solutions. The company's dedication to improving health and wellbeing has led to the development of Zinpro® Zinc LG, a new generation zinc, marked by a unique combination of an organic zinc source with glutamic acid (Glu) and lysine (Lys). This ensures superior zinc uptake, which could lead to increased zinc levels in humans.

Learn more at
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ZINPRO® ZINC LG

Three Main Takeaways

1. Zinc from food is absorbed in the gastrointestinal tract and is regulated by zinc-buffering proteins and intracellular transporters.

2. Phytic acid from a variety of foods can bind zinc in the GI tract when absorbed in a single meal.

3. A disrupted absorption of zinc can lead to a depressed immune system and higher risk for infection.

References available upon request