Zinotate™

DESCRIPTION: Zinotate delivers chelated zinc in the highly digestible picolinate form and in the amount necessary for those on modern diets or regimes not delivering optimal zinc for health.

FORMULATION: Each tablet contains zinc, 30 mg, from 150 mg of zinc picolinate as provided by Nutrition 21®.

INDICATIONS: A generous, daily amount of zinc is required for life, proper growth and adult health. Zinc deficiency has become a public health problem in some societies which accent diets high in food from grains1. Some common indications of zinc deficiency are listed.

1. Declining vision – zinc along with vitamin A help maintain night vision acuity2.
2. Stunted growth and late maturity – such occurs even in western societies. Zinc is both a required structural element and a catalyst in over 300 enzymes in mammals. Deficiency in this element has far-reaching effects because it is required by all cells, all tissues in our bodies.
3. Learning impairment and olfactory dysfunction – zinc plays an important role in neurotransmission, especially with glutamate, glycine and GABA transmissions2.
4. Lung health – large concentrations of zinc are necessary for maintenance of airway epithelial cell viability3. These are the cells constantly bombarded by airborne bacteria and viruses.
5. Oxidative stress and inflammation – low plasma zinc levels can lead to oxidation of LDL and VLDL with concomitant build-up of arterial plaque. Zinc is an important inhibitor of LDL oxidation4 and a critical component of superoxide dismutase (SOD); a protective enzyme located on the endothelial cell walls of arteries5.
6. Prostate health – zinc is important for maintaining proper prostate function7.

FEATURES: each tablet provides a full 30 mg (200% RDI) of chelated zinc. The chelate picolinate is designed for maximal delivery of trace elements through the digestive tract into human plasma.

DIRECTIONS: One to two tablets daily, with or between meals. Store in a dry cool place, keep out of reach of children.

BACKGROUND: In addition to being required by hundreds of enzymes, zinc is important for stabilizing collagen break-down products which modulate cell growth, it is also a modulator of the important neurotransmitters; glutamate, GABA and glycine. Zinc plays an important role in the stabilization of subcellular membranes; for instance, zinc deficiency is responsible for the breakdown of lysosomal membranes, within the cytosol of cells, which leads to gastric mucosal complaints. Zinc also plays a role in the digestion of iron; increasing levels of zinc actually help transport iron into the plasma. Recent research has shown that zinc is transported from the gut into the plasma by a set of enzymes specific for this trace metal. While some inhibition of zinc transport by iron (Fe II) has been noted, this is not a serious impediment for zinc uptake. Zinc is transported from

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the intestines into plasma via a group of newly discovered, dedicated proteins with the acronyms ZIP and ZnT.

**Dietary zinc** has also been shown to reduce the severity of intestinal tract and lung infections, probably by supporting quick re-growth of the exposed tissues lining these organs. Zinc is commonly given as treatment in the US for winter colds, perhaps for this reason. Another factor affecting zinc absorption is the presence/absence of phytate in diets rich in grains; zinc is complexed by this phosphosugar essentially removing the complexed zinc from the digestion process. Complications of chronic zinc deficiency arise because proliferation of the endothelial cells lining the gut is decreased in the absence of sufficient zinc, with concomitant anorexia and inflammation. Zinc, as well as iron and calcium, are antagonists to the uptake of cadmium by the gut and cadmium is a well-known poison, considered by some almost unavoidable in the modern diet.

**A critical role for zinc** is the absolute requirement for this metal by a class of proteins called NF κB. These proteins complex with zinc and only then are allowed to bind to specific sites on the DNA polymers in the cell nucleus. When these complexes also bind hormones, for instance estradiols or other cell signals, the linear information contained in the DNA sequence is transcribed into RNA, beginning the involved process of protein/enzyme biosynthesis.

**Zinc is prominent** as a requirement for healthy cells lining the prostate gland. Zinc supplementation has been shown to increase the concentrations of these cells while decreasing prostate size at the expensive of transformed cells. Studies suggest that undesirable cells of the prostate wall store little to no zinc and may also be inhibited by the presence of excess zinc.

**Perhaps two of the most well-known roles of zinc** in enzymatics are the structural requirement in the critical, protective zinc enzyme, superoxide dismutase (SOD) and as the active site metal of the enzyme carbonic anhydrase – which maintains plasma pH and catalyzes the release of carbon dioxide in the lungs. SOD, a small protein found in the circulatory system of mammals, has also recently been shown to be present in large amounts on arterial walls and highly protective against damage of cells by superoxide, both by oxidation of LDL and VLDL and direct damage of the epithelial lining of arteries. Remember that oxidized LDL has been shown to be an intimate component in arterial plaque build-up. The proven, protective mechanism of SOD, is the redox of the deleterious superoxide spontaneously formed by oxygen bound to circulating hemoglobin. It has been estimated that about 1% of respired oxygen is reduced to superoxide in the erythrocyte each day, making zinc SOD an absolute requirement for healthy erythrocytes, endothelial cells lining arteries and veins, and prevention of arterial plague. SOD is also a key protective enzyme in the eye, where it protects the nerves from debilitating damaging superoxide.

**References.**


