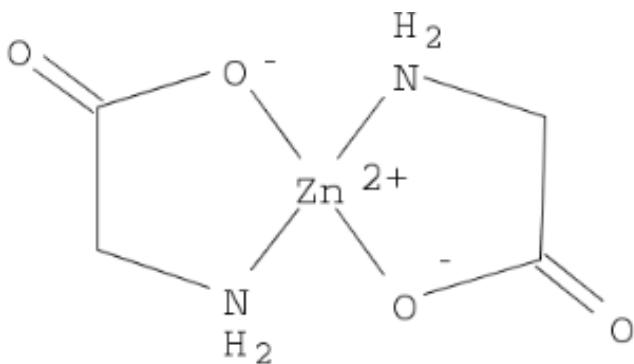


## Zinc Glycinate

### TECHNICAL SUMMARY

Zinc is an essential mineral that is involved in many aspects of cellular metabolism.\* Zinc is a key cofactor in hundreds of enzymatic reactions and plays a critical role in protein synthesis, the maintenance of cellular structures, and cell signaling.\* Because of these varied functions, zinc is necessary for the maintenance of skeletal, neurological, reproductive, and immune system health.\* Although dietary bioavailability of zinc is relatively poor, zinc glycinate has been shown to achieve superior absorption and bioavailability.

#### Structure Formula:



**Chemical Name:** Zinc Bisglycinate.

**Allergen and Additive Disclosure:** Not manufactured with wheat, gluten, milk, egg, fish, or shellfish ingredients. Produced in a GMP facility that processes other ingredients containing these allergens.

**Delivery Form:** Softgels.

### ROLE AS NUTRIENT/FUNCTION

Zinc functions as a co-factor for nearly 100 different enzymes.\* Zinc is also an indispensable structural element for certain proteins.\* Its presence contributes to the unique 3-dimensional shape of these proteins.\* A protein's biological function often depends on its unique 3-D shape; therefore, any shape alteration due to a modification of its zinc content might affect the function of these proteins.\* Some of these proteins have roles in gene regulation as DNA binding transcription factors.\* Zinc is also involved in cell signaling, hormone release, and apoptosis and is required for T-cell differentiation.\*<sup>1</sup> Zinc also appears to play particularly important role in prostate health, where zinc levels are at least 10 times higher than in other soft tissues.\*<sup>2</sup> Due to its ubiquitous involvement in metabolic processes, mild zinc deficiency is hard to recognize because it lacks specific symptoms that may include general malaise, impaired immunity, and tissue repair.\*

### NATUROKINETICS®

**Liberation:** Dissolution of the softgel capsule is measured in water using a USP testing method with dissolution between zero and 60 minutes.

## Supplement Facts

Serving Size 1 Softgel

	Amount Per Serving	% Daily Value
Zinc (from Zinc Bisglycinate) (TRAACS®)	30 mg	273%
Pumpkin Seed Oil (Cold-Pressed)	250 mg	†

† Daily Value not established.

Other ingredients: Softgel Capsule (bovine gelatin, glycerin, water, carob), Beeswax and Soy Lecithin.

- Supports Healthy Immune Function\*
- Superior Bioavailability

**SUGGESTED USAGE:** Take 1 softgel daily, or as directed by your healthcare practitioner.

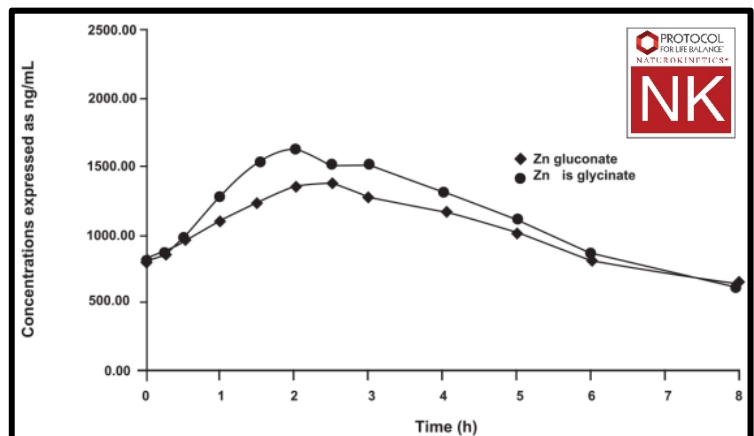


Figure 1. Mean zinc serum concentrations during 8 hours after a single administration of zinc gluconate or zinc bisglycinate (Albion®) (both delivering 15 mg elemental Zn) in twelve healthy volunteers.

**Absorption:** The absorption rate of zinc depends on actual zinc status. Most dietary zinc is absorbed in the small intestine via an active saturable mechanism. Approximately 15-40% of zinc from food is absorbed. In a randomized cross-over pharmacokinetic study in 12 healthy volunteers receiving a single administration of zinc bisglycinate delivering 15 mg elemental zinc, maximum serum concentrations were reached within 2 hours ( $T_{max}$ ). The overall bioavailability of zinc from zinc bisglycinate was 43.4% higher than zinc from the form of gluconate salt (Figure 1).

**Distribution:** Zinc reserve pools are primarily found in skeletal muscle, bone, and prostate, which comprise approximately 85% of total body zinc stores. Plasma zinc is only 0.1% of this total, and its concentration is tightly regulated.

**Metabolism:** The liver is responsible for zinc homeostasis in the body. Stress, acute trauma, and infection can result in lower plasma zinc concentrations. Fasting, on the opposite, can result in increased plasma zinc concentrations.

**Elimination:** The pancreas is a major route of endogenous zinc excretion. These losses may range from less than 1 mg/day with a zinc-poor diet to greater than 5 mg/day with a zinc-rich diet. Zinc is primarily excreted in the feces with little excretion via urine.

### CLINICAL VALIDATION

- **Metabolic Support.\*** In a clinical study using healthy men, low-zinc diets were utilized to investigate the importance of zinc intake on basal metabolic rate (BMR). The study was divided into 3 metabolic periods (MP) where the diets were labeled as MP1, MP2, and MP3: MP1 and MP3 with 16.5 mg Zn/d diet and MP2 with 5.5 mg Zn/d diet, spread across 54 days. Basal metabolic rate was measured by open-circuit indirect calorimetry and other biomarkers including TSH, TRH, T<sub>4</sub>, Retinol-binding protein, prealbumin, and transferrin. After each metabolic period, biomarkers were recorded. Results showed that the BMR significantly decreased during the low-zinc dietary period (MP2, 5.5 mg Zn/d) supporting zinc's role in maintaining metabolic processes.\* (Figure 2).

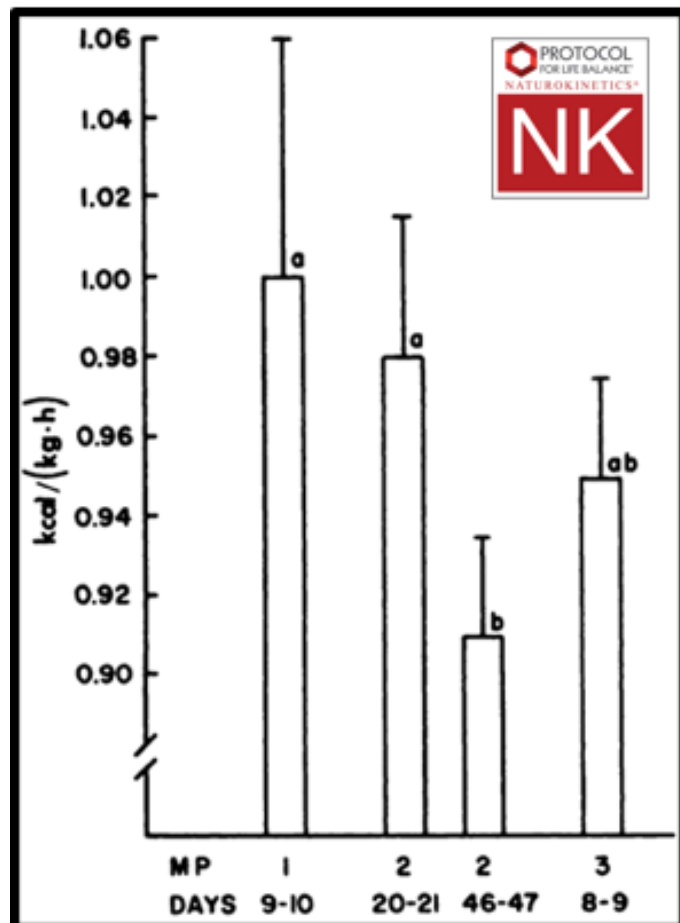


Figure 2: Basal metabolic rate measured at MP1, MP2, and MP3 intervals using open-circuit indirect calorimetry.

- **Seasonal Support.\*** In a double-blind, randomized controlled trial, in healthy Thai school children aged 8-13 years receiving daily 15 mg zinc bisglycinate or matching placebo for three months, zinc supplementation did not modify the incidence of seasonal events; however, it significantly shortened the duration of said events.\*

### SAFETY INFORMATION

**Tolerability:** Well tolerated when used at the recommended doses. May cause occasional mild gastrointestinal adverse effects such as diarrhea, abdominal discomfort, and nausea.

**Contraindications:** Zinc supplementations in patients with HIV infection must be monitored.

### INTERACTIONS

**Drug Interactions:** Zinc has been shown to decrease the absorption of penicillamine, quinolone, and tetracycline antibiotics by forming complexes with these medications in the gastrointestinal tract. Patients should be advised to take these drugs at least 2 hours before or 4-6 hours after zinc supplements. Zinc may decrease cephalexin levels by chelation therefore preventing its absorption when taken together. Zinc may also interfere with cisplatin therapy by stimulating production of metallothionein, which binds to and inactivates cisplatin. Amiloride can reduce excretion of supplemental zinc especially when used at doses 10 mg/d or more.

**Supplement Interactions:** Calcium, chromium, phytic acid, and iron have been shown to decrease the absorption of zinc. High doses of zinc supplements (142 mg/day) or high dietary zinc intake (53 mg/day) may decrease magnesium stores. Concomitant use of high doses of zinc with herbs and other supplements affecting glucose metabolism, such as alpha-lipoic acid, chromium, devil's claw, fenugreek, garlic, and others, could theoretically increase the risk of low blood sugar, and caution is advised.

**Interaction with Lab Tests:** Supplementation with elemental zinc 50 mg per day has increased HbA1C in type 1 diabetics. Zinc supplementation might increase the ratio of low-density-lipoprotein to high-density-lipoprotein (LDL/HDL) cholesterol and test results.

### STORAGE

Store in a cool, dry place.