

Zinc Citrate – Supports Healthy Skin and Immune Function

About Zinc Citrate

- Zinc is an essential mineral needed by at least 200 enzymes for proper function and binds to as many as 3,000 proteins in the body.^{1,2}
- As the second most abundant micronutrient in the body (after iron), zinc is needed for many different physiological processes. It is required for optimal functioning of multiple body systems, including immune, reproductive, metabolic, and neurological functions, as well as wound healing and musculoskeletal growth and development.¹
- Zinc deficiency is thought to be one of the most common deficiencies worldwide. The risk for deficiency is greater among children and older adults, pregnant women, and people with lower dietary intake, including vegetarians/vegans and individuals on a low-calorie diet. Deficiency can also be a result of impaired absorption, which may occur with digestive disorders such as celiac or inflammatory bowel disease, or following bariatric surgery.^{1,3-6}
- A zinc deficiency has been associated with oxidative (free radical) stress, infertility, impaired immune function, increased insulin resistance, inflammation, and altered lipid (cholesterol and triglyceride) metabolism.⁷⁻¹⁰
- Zinc may be especially important to the male reproductive system. A deficiency has been associated with lower testosterone levels and infertility, while zinc supplementation has been shown to raise testosterone and improve several parameters related to sperm health.^{11,12}
- Although it is needed for many aspects of normal development, low zinc intake and/or deficiency has been found to be very common in pregnant women.¹³
- Supplementation has been shown to reduce the duration and symptoms associated with upper respiratory tract infections, and to improve several biomarkers of cardiovascular risk and oxidative stress.^{14,15}
- Zinc citrate has been shown to be better absorbed than some other forms of zinc, such as zinc oxide, with similar absorption to zinc gluconate.¹⁶

How to Use Zinc Citrate

- Take 1–2 tablets per day or as directed by a health care practitioner. Take with food, a few hours before or after taking other medications or natural health products.

Cautions and Contraindications

- Zinc supplementation can cause a copper deficiency. Keep out of reach of children.

PATIENT NAME: _____

PRACTITIONER NOTES:

Drug Interactions

- Zinc may reduce the absorption of some medications, including fluoroquinolones and tetracycline.^{17,18}

Quick Tips for Optimal Health

- Animal sources of food are generally high in zinc, with the greatest amounts found in oysters, shellfish, and red meat.¹⁹
- Although some plant foods have higher amounts of zinc, including whole grains, fortified cereals, pulses, nuts, beans, and seeds, many of these same foods are also high in phytate. Phytate is a component of plant-based foods that may interfere with the absorption of minerals, including both iron and zinc.¹⁹
- Soaking plant foods high in phytate for several hours before cooking them has been associated with a reduction in the phytate content by approximately 50%. Cooking, fermentation, milling, and sprouting also reduce the phytate content.²⁰
- Iron may also inhibit the absorption of zinc, though it is not clear if this happens to a significant degree at usual intakes of either mineral. Certainly, high doses of iron inhibit zinc absorption, such as with iron supplementation, and iron and zinc should be taken at different times of the day.¹⁰
- In the United States, intake of many nutrients that help support immune function has been found to be less than optimal. Data from a nationally representative sample (NHANES) found that while 15% had an inadequate intake of zinc, 45% had a low intake of vitamin A, 46% of vitamin C, 95% of vitamin D, and 84% of vitamin E.²¹
- Inadequate zinc intake may be associated with lower energy levels. In a group of older participants with fatigue, for which zinc deficiency is more likely, supplementation with zinc was shown to improve energy levels over a 70-day study period.²²
- In a large review of observational studies, several foods and nutrients were associated with male fertility. For example, foods rich in omega-3 fatty acids, zinc, antioxidants, fish, and vegetables and fruits were associated with greater fertility, while the opposite effect was observed with a higher intake of processed meats, dairy, and sugar-sweetened beverages.²³

PRACTITIONER CONTACT INFORMATION:

References

1. Gibson, R.S., Hess, S.Y., Hotz, C., et al. (2008). Indicators of zinc status at the population level: A review of the evidence. *Br J Nutr*, 99(Suppl 3), S14-23.
2. Maywald, M., & Rink, L. (2022). Zinc in human health and infectious diseases. *Biomolecules*, 12(12), 1748.
3. Wessells, K.R., Singh, G.M., & Brown, K.H. (2012). Estimating the global prevalence of inadequate zinc intake from national food balance sheets: Effects of methodological assumptions. *PLoS One*, 7(11), e50565.
4. Hall, A.G., & King, J.C. (2023). The molecular basis for zinc bioavailability. *Int J Mol Sci*, 24(7), 6561.
5. Ehrlich, S., Mark, A.G., Rinawi, F., et al. (2020). Micronutrient deficiencies in children with inflammatory bowel diseases. *Nutr Clin Prac*, 35(2), 315-22.
6. Wierdsma, N.J., van Bokhorst-de van der Schueren, M.A., Berkenpas, M., et al. (2013). Vitamin and mineral deficiencies are highly prevalent in newly diagnosed celiac disease patients. *Nutrients*, 5(10), 3975-92.
7. Wirth, J.P., Zeng, W., Petry, N., et al. (2023). The global burden of high fasting plasma glucose associated with zinc deficiency: Results of a systematic review and meta-analysis. *PLOS Glob Public Health*, 3(3), e0001353.
8. Shen, H., Oesterling, E., Stromberg, A., et al. (2008). Zinc deficiency induces vascular pro-inflammatory parameters associated with NF-kappaB and PPAR signaling. *J Am Coll Nutr*, 27(5), 577-87.
9. Shen, T., Zhao, Q., Luo, Y., et al. (2022). Investigating the role of zinc in atherosclerosis: A review. *Biomolecules*, 12(10), 1358.
10. Roohani, N., Hurrell, R., Kelishadi, R., et al. (2013). Zinc and its importance for human health: An integrative review. *J Res Med Sci*, 18(2), 144-57.
11. Te, L., Liu, J., Ma, J., et al. (2023). Correlation between serum zinc and testosterone: A systematic review. *J Trace Elem Med Biol*, 76, 127124.
12. Zhao, J., Dong, X., Hu, X., et al. (2016). Zinc levels in seminal plasma and their correlation with male infertility: A systematic review and meta-analysis. *Sci Rep*, 6, 22386.
13. De Benedictis, C.A., Trame, S., Rink, L., et al. (2023). Prevalence of low dietary zinc intake in women and pregnant women in Ireland. *Ir J Med Sci*, 192(4), 1835-45.
14. Hunter, J., Arentz, S., Goldenberg, J., et al. (2021). Zinc for the prevention or treatment of acute viral respiratory tract infections in adults: A rapid systematic review and meta-analysis of randomised controlled trials. *BMJ Open*, 11(11), e047474.
15. Nazari, M., Ashtary-Larky, D., Nikbaf-Shandiz, M., et al. (2023). Zinc supplementation and cardiovascular disease risk factors: A GRADE-assessed systematic review and dose-response meta-analysis. *J Trace Elem Med Biol*, 79, 127244.
16. Wegmüller, R., Tay, F., Zeder, C., et al. (2014). Zinc absorption by young adults from supplemental zinc citrate is comparable with that from zinc gluconate and higher than from zinc oxide. *J Nutr*, 144(2), 132-6.
17. Shakeri-Nejad, K., & Stahlmann, R. (2006). Drug interactions during therapy with three major groups of antimicrobial agents. *Expert Opin Pharmacother*, 7(6), 639-51.
18. Mapp, R.K., & McCarthy, T.J. (1976). The effect of zinc sulphate and of bicitropeptide on tetracycline absorption. *S Afr Med J*, 50(45), 1829-30.
19. Chouraqui, J.P. (2023). Risk assessment of micronutrients deficiency in vegetarian or vegan children: Not so obvious. *Nutrients*, 15(9), 2129.
20. Gibson, R.S., & Anderson, V.P. (2009). A review of interventions based on dietary diversification or modification strategies with the potential to enhance intakes of total and absorbable zinc. *Food Nutr Bull*, 30(1 Suppl), S108-43.
21. Reider, C.A., Chung, R.Y., Devarshi, P., et al. (2020). Inadequacy of immune health nutrients: Intakes in US adults, the 2005-2016 NHANES. *Nutrients*, 12(6), 1735.
22. Afzali, A., Goli, S., Moravveji, A., et al. (2021). The effect of zinc supplementation on fatigue among elderly community dwellers: A parallel clinical trial. *Health Sci Rep*, 4(2), e301.
23. Salas-Huetos, A., Bulló, M., & Salas-Salvadó, J. (2017). Dietary patterns, foods and nutrients in male fertility parameters and fecundability: A systematic review of observational studies. *Hum Reprod Update*, 23(4), 371-89.