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Are You Getting Enough Zinc?

Analysis by Dr. Joseph Mercola Fact Checked | August 24, 2022

STORY AT-A-GLANCE

- Zinc is an essential mineral found throughout your body's organs, tissues and fluids, and to be healthy, you must intake zinc daily through the foods you eat or a supplement
- Zinc supports critical processes within your body such as blood clotting, cell division, immune function, thyroid health, smell, taste, vision and wound healing
- Zinc deficiency lowers your body's ability to repair genetic damage caused by oxidative stress. If your diet is rich in zinc and other antioxidants, your body will be able to efficiently combat free radicals
- Good dietary sources of zinc include dairy products, nuts, red meat and seafood; plant sources like beans, green peas and spinach also contain zinc, but it is more easily absorbed from animal proteins
- Alcoholics, vegetarians, pregnant or lactating women, and those with digestive disorders or sickle cell disease are at higher risk of zinc deficiency

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While you may think about it mainly during cold and flu season, zinc is an essential mineral found throughout your organs, tissues and bodily fluids. Moreover, after iron, zinc is the second most abundant trace mineral in your body. Because zinc plays a vital role in many biological processes, you may be surprised to learn that your body does not

store zinc. Instead, it has to be consumed daily, either through the foods you eat or a high-quality supplement.

Zinc supports critical processes within your body such as blood clotting, cell division, immune function, thyroid health, smell, taste, vision and wound healing. Good dietary sources of zinc include dairy products, nuts, red meat and seafood. Although plant sources such as asparagus, beans, green peas and spinach contain zinc, it is more easily absorbed from meat and animal proteins.

If you are an alcoholic or vegetarian, are pregnant or lactating, or have a digestive disorder or sickle cell disease, you are more likely to have a zinc deficiency. Even if you consider yourself to be a healthy person, you may not be eating enough zinc-rich foods on a daily basis to achieve optimal levels of this essential nutrient.

Why Your Body Needs Zinc

Well beyond helping your body fight off a cold or flu, zinc plays many other crucial roles within your body. In fact, there are more biological roles for zinc than for all the other trace elements put together. For example, your body contains 300 unique enzymes that require zinc to function normally. Furthermore, researchers estimate about 3,000 proteins out of the roughly 100,000 you have in your body consist predominantly of zinc. Your body needs zinc for:

Blood clotting and wound healing	Gene transcription (the process that allows your cells to read genetic instructions)	Sense of smell and taste
Blood sugar balance	Immune system support	Thyroid health
Cell division and growth	Mood	Vision

Zinc also protects your body against oxidative stress and helps with DNA repair. While some level of oxidative stress is a normal result of your body processes (such as breathing and digestion), many factors — ranging from air pollution to radiation and emotional stress to obesity — can cause an excess of free radicals in your body.[1]

An overabundance of free radicals is associated with oxidative stress. Oxidation is the same process responsible for turning apple flesh brown and rusting metal — it breaks things down. In humans, oxidation accelerates aging.

High levels of oxidative stress affect every organ and organ system in your body. Research suggests oxidative stress is directly linked to conditions such as Alzheimer's disease, cancer, colitis, dementia, gastric cancer, gastritis and inflammatory bowel disease.[2,3]

If you are deficient in zinc, your body may be less able to repair genetic damage caused by oxidative stress. On the other hand, if your diet is rich in zinc and other antioxidants, such as vitamins A, C and E, your body will be able to fight back against free radicals.

Zinc's Effect on Your Immunity, Mood and Thyroid

As mentioned above, zinc affects your immune system, mood and thyroid. Let's take a closer look at each area.

- **Immune system**[4] **—** If you have taken zinc lozenges at the first sign of a cold or to help shorten the duration of a cold, flu or infection, you already recognize zinc's role in strengthening your immune system. Zinc plays a vital role in activating your body's T cells, certain white blood cells tasked with destroying infected cells.

  If you fall victim to frequent bacterial infections or colds, your body might be trying to tell you it needs more zinc. Given its immune-boosting properties, zinc supplements also can be useful to address bacterial issues such as acne, body odor and dandruff.

- **Mood**[5] — If you suffer from depression, it is likely that your body has too little zinc. Researchers have observed low serum blood levels of zinc in depressed individuals, which suggests zinc deficiency may trigger chronically poor mood. Depression causes your hippocampus to shrink, and this is the part of your brain involved with emotion, memory and learning.

  Because zinc has been shown to protect your hippocampus from the inflammation caused by emotional stress, it is considered to be an important factor in the treatment of depression. Furthermore, zinc can activate your body's production of brain derived neurotrophic factor (BDNF), a crucial metabolic agent needed to counteract brain inflammation and depression.

- **Thyroid**[6,7] — Related to your thyroid health, zinc plays a role in making thyroid releasing hormone in your brain, which in turn signals your pituitary gland to make thyroid stimulating hormone. Low zinc is associated with low T3 and a reduced ability for your body to convert T4 to T3, an action also requiring sufficient stores of selenium.

  When your zinc levels are low, you may experience many of the characteristic symptoms of low thyroid such as cold hands and feet, sluggish metabolism and thinning hair. Zinc also helps your thyroid hormone bind to the DNA receptors inside your cells. If you are lacking in zinc, your body can't effectively make use of thyroid hormone even if you have normal levels of it in your blood.

Four Signs You May Be Zinc Deficient

Zinc deficiency is common in the developing world and at least 2 billion people are thought to be deficient. In addition, about 12 percent of the U.S. population, and as much as 40 percent of the elderly, are also at risk for zinc deficiency.[8] Part of the deficit likely results from soil depletion due to conventional farming methods, as well as the use of toxic pesticides such as Roundup.

Beyond the soil concerns, many simply do not eat enough zinc-rich foods, and the mineral is often poorly absorbed. Compounding the problem is the reality that zinc levels are not always tested, and available testing methods are not always accurate. Before you pursue testing, perhaps the best way to determine if you may be deficient is to watch for these common signs your body may need more zinc:

- Lack of appetite
- Depression
- Impaired sense of taste or smell
- Frequent colds, flu or infections

"Zinc deficiencies have been somewhat under the radar because we just don't know that much about mechanisms that control its absorption, role or even how to test for it in people with any accuracy," said Emily Ho, Ph.D., principal investigator with the Linus Pauling Institute at Oregon State University, and international expert on the role of dietary zinc.[9]

Additional Signs of Zinc Deficiency That Apply to Children

In children, the presence of zinc deficiency may manifest itself somewhat differently than what is commonly observed in adults. According to Dr. Timothy Wilens, division chief for child and adolescent psychiatry at Massachusetts General Hospital in Boston, the main symptoms related to zinc insufficiency to look for in children are:

- Excessive dandruff
- Hangnails
- Inflamed cuticles
- Rashes

Three Common Tests Used to Help Identify Low Zinc

Beyond taking notice of any physical symptoms, the most common tests used to help identify zinc deficiencies are:

- Blood test
- Hair analysis
- Oral taste test

Interestingly, the oral taste test involves you holding 10 milliliters of liquid zinc in your mouth for 10 seconds. Because liquid zinc has an intense taste, if your zinc levels are normal, you will probably not be able to tolerate the strong taste for very long. It will taste quite bitter. In fact, you may want to immediately expel the liquid from your mouth!

If you are deficient, however, you will likely be able to hold the zinc in your mouth without any difficulty because it will taste like water. This is so because the absence of sufficient zinc in your body has somewhat disabled your sense of smell and taste, which means you will not be affected by liquid zinc's intensity. In fact, by the ease with which it is tolerating the liquid zinc, your body is signaling you that it desperately needs this mineral.

Whatever method you choose to help diagnose a zinc deficiency, you will want to involve your doctor. Due to the critical role zinc plays within your body, you should approach any zinc-related diet and supplementation changes carefully. In my opinion, you will fare better with the guidance of an experienced medical professional.

An Imbalance of Zinc and Copper May Lead to Health Problems

Another reason to involve your doctor to help you optimize your zinc level relates to how zinc interacts with other minerals in your body. You may not realize your body has an intricate method of maintaining balance among trace minerals in your system. A few of those minerals are chromium, copper, iron and zinc. The proper balance among them is more readily achieved when you consume them in real food.

Dietary sources of minerals are more easily balanced by your body, whereas minerals acquired through supplements are harder for your body to manage. For example, it's important to keep an eye on your zinc-to-copper ratio because excess zinc may lead to a copper deficiency. This is because their absorption patterns in your gastrointestinal tract are similar.

For that reason, it is better to avoid taking supplemental zinc and copper at the same time because competition for absorption may lead to an increase in zinc and a reduction in copper. If you overdo it on zinc, you may have to deal with headaches, loss of appetite, nausea, vomiting and stomach cramps. As such, you are better off getting your body's zinc needs met from real food.

Symptoms of and Causes for Copper Deficiency

Copper deficiency can be the result of malabsorption, malnutrition or from an excess of zinc in your system. According to researchers at Oregon State University,[10] high intake of zinc may increase the creation of metallothionein, a cell protein in your intestines that binds to some metals and prevents absorption. Because metallothionein has a greater affinity for copper than zinc, high levels of metallothionein induced by excess zinc cause a decrease in copper absorption.

In contrast, excessive intake of copper has not been found to affect zinc levels. One of the more common symptoms of a copper insufficiency is anemia. As such, your body will not respond to an increase in iron, which is a traditional means of addressing anemia, but it will improve, however, when you supplement with copper.[11]

Copper deficiency may also lead to an abnormally low white blood cell count (neutropenia), which increases your potential for infection. In this instance, you may take a zinc supplement to alleviate your cold symptoms and, at the same time, unknowingly worsen your copper deficiency. Other abnormalities related to copper deficiency include osteoporosis, low infant birth weight and loss of skin pigmentation.

Could Zinc Help Manage the Symptoms of ADHD?

A number of studies[12] have found children afflicted with attention deficit-hyperactivity disorder (ADHD) are more likely to be zinc-deficient than other children. ADHD, which is characterized by lack of attention, impulsiveness and impaired mental focus, is thought to affect 3 to 6 percent of school-aged children in the U.S. While stimulant medications are often recommended for ADHD, zinc has been shown to contribute to improved behavior.

This is due to its regulatory effects on certain brain neurotransmitters, as well as fatty acids and melatonin. However, a supplement will only have an effect if your child is zinc deficient. This therapy will have very little, if any, effect on the ADHD symptoms of children who have normal zinc levels. As noted by the authors of a 2009 study published in the journal of the Academy of Medical Sciences of Croatia:[13]

> *"[For] ADHD children with zinc deficiency or low plasma zinc concentration, zinc dietary supplementation … may be of great benefit. A study of ADHD treatment with zinc sulfate as a supplement to methylphenidate (a stimulant drug) showed beneficial effects of zinc supplementation in the treatment of children with ADHD."*

A 2015 study[14] published in the Chinese Journal for Contemporary Pediatrics also indicated that zinc may be beneficial for children diagnosed with ADHD. The study authors said: "A total of 17 studies, including 2,177 children with ADHD and 2,900 normal children … showed that serum zinc levels in children with ADHD were lower than [the levels in] normal children. Serum zinc levels may be associated with susceptibility to ADHD in children."

Zinc From Real Food Is Your Healthiest Option

If you have symptoms of a zinc deficiency and your doctor recommends you use a supplement, ensure it is from a reputable company using best-practice quality

assurance methods. Independent verification of the raw materials is vital to confirm its quality and ensure the product is free of lead and other heavy metals.

To increase its bioavailability, I recommend a supplement containing several zinc compounds, my favorites being gluconate, citrate and chelate, which is bound to an amino acid. Unless your health care provider instructs you otherwise, it would be best to limit your intake of zinc to 30 to 40 milligrams (mg) per day and that would only be for a few days. It is best not to exceed 15 mg per day and always take it with 1-2 mg of copper to make sure you don't develop copper deficiency.

While it may be necessary from time to time, I do not believe isolating certain nutrients in supplement form can provide the same health benefits as you would receive by getting the nutrient from a whole food. As such, I recommend you try to meet your daily zinc requirements from real foods, and only use a zinc supplement when directed by your doctor. Below are some of the best food-based sources of zinc:[15,16]

Alaskan King crab	Kefir	Oysters
Almonds	Kidney beans	Pastured chicken
Cashews	Lamb	Pork chops
Cheddar or Swiss cheese	Liver	Pumpkin seeds
Chickpeas	Lobster	Spinach
Grass fed beef	Mushrooms	Tahini
Green peas	Oatmeal	Yogurt

While zinc is often added to breakfast cereals and other packaged fortified foods, I discourage consumption of them. Processed foods have very little nutrients and you will do far better by consuming the whole-food sources of zinc as noted above.

Tips to Help Vegetarians and Vegans Increase Zinc Intake

If you are a vegetarian or vegan, you will face additional challenges in optimizing your zinc levels. This is mainly due to the reality that grain- and plant-based sources of zinc contain phytic acid. Phytate is a naturally occurring compound found in all plant foods like beans, grains, nuts and seeds. Because phytic acid binds to zinc, it reduces its bioavailability.

To increase your zinc absorption, I suggest you soak beans, grains, nuts and seeds at a temperature of 140 degrees F (60 degrees C) for approximately three hours before cooking them. Higher or lower temperatures seem to be ineffective, whereas 140F/60C appears to be the "sweet spot." This soaking method will slash the phytic acid content in half. You can reduce it further by continuing to soak the items until sprouts appear.

That said, be aware of the fact that many beans are high in lectins, which can have a very damaging effect on your health. Also, while grains are often a big part of vegetarian and vegan diets, the negative effects of gluten on your digestion and absorption should not be overlooked. If you choose to consume grains, I recommend you consume unleavened grains versus leavened ones to optimize the zinc content. Phytic acid is reduced through the leavening process.

Zinc: Recommended Dietary Allowance

When treating the common cold, MedlinePlus[17] recommends you take one zinc gluconate or acetate lozenge, which provides 9 to 24 mg of elemental zinc, every two hours while you are awake. Dissolve the lozenge in your mouth and continue the treatment for as long as cold symptoms are present. Zinc acetate may be one of the best forms of zinc to use for this purpose.

Beyond treating cold symptoms, adequate zinc intake is vital for adults and children. Getting sufficient zinc may be even more important for children because even a mild deficiency can impede their growth and increase the risk of diarrhea, infection and respiratory disease. The recommended dietary allowance by age for zinc is:[18,19]

Gender / Age	Recommended dietary allowance
Children (boys and girls) ages 1 to 8 years old	3 to 5 mg, increasing as the child gets older
Females ages 9 to 13	8 mg
Females ages 14 to 18	9 mg
Females ages 19 and older	8 mg
Females, pregnant and lactating	11 to 13 mg, depending on age
Males ages 9 to 13 years old	8 mg
Males ages 14 and older	11 mg

To give you an idea of how those recommended values can be met through your diet, the zinc content of some common food items is as follows:[20]

Beef, lean chuck roast, braised, 3 ounces — 7 mg	Alaskan King crab, cooked, 3 ounces — 6.5 mg
Ground beef, lean, 3 ounces — 5.3 mg	Lobster, cooked, 3 ounces — 3.4 mg
Pork loin, lean, cooked, 3 ounces — 2.9 mg	Wild rice, cooked, 1/2 cup — 2.2 mg
Green peas, cooked, 1 cup — 1.2 mg	Yogurt, plain, 8 ounces — 1.3 mg
Pecans, 1 ounce — 1.3 mg	

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