Health by Hope
Functional Nutrition and Lifestyle Strategies

Selenium:

Why is Selenium Important?

Selenium is another trace mineral that is essential for certain functions in your body. Because your body doesn't need a lot of selenium the difference in concentration between a toxicity and deficiency isn't very much. The bioavailability of selenium depends on what form of selenium is consumed. Selenium is important for thyroid function, reproductive function, immunity, and is an antioxidant.

What Body is Functions Selenium Important For?

Antioxidant: forms selenocysteine along with other antioxidants that help protect your cells from damage from oxidative free radicals.

Immune Function: Selenium is important for the formation and activity of immune cells, which helps your body fight diseases and infections.

Thyroid Hormone: Selenium supports the production of thyroid hormones. It aids in the conversion of inactive thyroid hormone (T4) to the active form (T3).

Reproductive Health: Selenium can help with sperm motility and reduce a women's risk of miscarriage.

Different Types of Selenium:

Selenites: This form of selenium is inorganic and is known as sodium selenite. It is found in selenium supplements and some medications.

Selenocysteine: This form of selenium is an amino acid and is a crucial component selenoproteins.

Selenomethionine: This form of selenium is the form of selenium that is easily absorbed by the human body from supplements and food.

Food Sources Selenium is in:

Food	Mcg / Serving
Brazil Nuts (6-8 nuts)	544
Yellowfin Tuna (3 ounces)	92
Sardines (3 ounces)	45
Shrimp (3 ounces)	42
Pork Chop (3 ounces)	37
Beef Steak (3 ounces)	37
Spaghetti (1 cup)	33
Beef Liver (3 ounces)	28
Turkey (3 ounces)	26
Ham (3 ounces)	24
Pacific Cod (3 ounces)	24
Chicken (3 ounces)	22
Cottage Cheese (1 cup)	20
Ground Beef (3 ounces)	18
Hard Boiled Egg	15
Baked Beans (1 cup)	13
Oatmeal (1 cup)	13
Portabella Mushrooms (½ cup)	13
Brown Rice (1 cup)	12
Whole-Wheat Bread (1 slice)	8
Yogurt (1 cup)	8
Milk (1 cup)	6
White Bread (1 slice)	6
Spinach (1 cup)	5
Spaghetti Sauce (1 cup)	4
Pistachios (1 ounce)	3

Signs and Causes of Selenium Deficiency:

Selenium deficiency is very rare in the United States because our soil is generally rich in selenium. Selenium deficiency doesn't directly cause disease; however, it can predispose people to disease. People who are at great risk for selenium deficiency are those who are vegan or vegetarian, people with HIV, and those who are undergoing dialysis for kidney failure.

Symptoms of selenium deficiency include nausea, vomiting, headaches, altered mental status, confusion, fatigue, seizures, infertility, hair loss, weakened immune system, and coma.

Signs and Causes of Selenium Toxicity:

Selenium toxicity isn't common; however, you can easily intake more than recommended because your body needs so little. This can be from overusing selenium supplements or eating selenium rich foods like Brazil nuts.

Symptoms of selenium toxicity includes metallic taste in mouth, nausea, diarrhea, hair loss, nail brittleness or discoloration, skin rash or lesions, skin flushing, fatigue, irritability, and muscle tenderness.

Supplementation of Selenium:

Supplementation of selenium can be beneficial if you aren't consuming enough selenium or live in an area where food sources of selenium are hard to come by. This can help lower your risk of developing certain diseases like cardiomyopathy or certain cancers. They can also boost your immune function and support healthy thyroid function.

***It is important to know that dietary intake of selenium should be your main source of selenium, and any selenium supplements should supplement that selenium you are already ingesting.**

Daily Recommended Dose of Selenium:

Age	Male	Female	Pregnancy	Lactation
Birth to 6 months	15 mcg	15 mcg		
7-12 months	20 mcg	20 mcg		
1-3 years	20 mcg	20 mcg		
4-8 years	30 mcg	30 mcg		
9-13 years	40 mcg	40 mcg		
14-18 years	55 mcg	55 mcg	60 mcg	70 mcg
19-50 years	55 mcg	55 mcg	60 mcg	70 mcg
51+ years	55 mcg	55 mcg		

References

Minich, W. B. (2022, January). *Selenium metabolism and biosynthesis of selenoproteins in the human body*. Biochemistry. Biokhimiia. https://pmc.ncbi.nlm.nih.gov/articles/PMC8802287/

Navarro-Alarcón, AbstractIn the present review different aspects related to the essential element selenium in the human organism are considered. A large number of human studies have been performed in order to improve knowledge on the influence of this element in the origi, Armstrong, A. M., Benemariya, H., Berg, E. A., Bratakos, M. S., Burk, R. F., Burney, P. G. J., Cantor, A. H., Chan, S., Cuvin-Aralar, M. L., vos, R. H. D., Diaz-Alarcon, J. P., Frost, D. V., Greger, J. L., Guarini, P., Jossa, F., Klapec, T., Korpela, H., … Diaz-Alarcón, J. P. (2000, April 12). *Essentiality of selenium in the human body: Relationship with different diseases*. Science of The Total Environment. https://www.sciencedirect.com/science/article/abs/pii/S0048969799005264

Navarro-Alarcon, M., & Cabrera-Vique, C. (2008). Selenium in food and the human body: a review. *Science of the total environment, 400(1-3), 115-141.*

Navarro-Alarcon, M., & López-Martınez, M. C. (2000). Essentiality of selenium in the human body: relationship with different diseases. *Science of the Total Environment, 249(1-3), 347-371.*

Schmidt, R. L., & Simonović, M. (2012, December). *Synthesis and decoding of Selenocysteine and human health*. Croatian medical journal. https://pmc.ncbi.nlm.nih.gov/articles/PMC3541580/

Selenium. The Nutrition Source. (2024, November 7). https://nutritionsource.hsph.harvard.edu/selenium/

Selenomethionine. Selenomethionine - an overview | ScienceDirect Topics. (n.d.). https://www.sciencedirect.com/topics/medicine-and-dentistry/selenomethionine

U.S. Department of Health and Human Services. (n.d.-e). *Office of dietary supplements - selenium*. NIH Office of Dietary Supplements. https://ods.od.nih.gov/factsheets/Selenium-HealthProfessional/