



Health & Wellness



The Missing Nutrients: B, D, and Fish Oil



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Nutrients are substances obtained from the food and drink we take in. They are essential for the growth, development, maintenance and functioning of the body.

There are six categories of nutrients that we need: carbohydrates, proteins, fats (also called lipids), vitamins, minerals and water. Within these categories, there are "essential" nutrients that must be obtained from the diet. Other nutrients can be made within the body using our cellular machinery to convert and combine these essential nutrients. In the protein category there are nine essential amino acids (the building blocks of proteins). I think of amino acids as if they were Legos with a seemingly limitless number of long proteins made from their combinations and configurations. These essential amino acids are: Histidine, Isoleucine, Leucine, Lysine, Methionine, Phenylalanine, Threonine, Tryptophan, and Valine.

There are two essential fatty acids: Linoleic acid (an Omega-6 fatty acid) and Alpha-linolenic acid (an Omega-3 fatty acid). These cannot be made by the body but the food manufacturers seem to give us ample supply of linoleic and its derivatives in our processed foods, creating a substantial imbalance in our essential fatty acids.

All 13 of the vitamins are essential — again they must be obtained from the diet. These are the fat-soluble

vitamins A, D, E, and K and the water-soluble vitamins C and the Bs. The Bs are a large group comprising B1 (thiamine), B2 (riboflavin), B3 (niacin), B5 (pantothenic acid), B6 (pyridoxine), B7 (biotin), B9 (folate), and B12 (cobalamin). The B vitamins work collaboratively and a deficiency of one can lead to a deficiency of others.

The mineral category however, claims the most essential members — 14 at least! They are: Calcium, Phosphorous, Potassium, Sodium, Magnesium, Chloride, Iron, Zinc, Copper, Manganese, Iodine and Selenium. But Sulfur (as part of amino acids), and Cobalt (as part of Vitamin B12), as well as Nickel, Vanadium, Boron and Silicon are also considered beneficial/borderline essential, but not essential in the strictest sense. Nonetheless, what do you think our Standard American Diet is giving us? Our highly-processed and ultra-processed foods, fast foods, repetitive rotation of few foods, eat-out, take-out Standard American Diet? No wonder we see deficiencies, excesses and overall imbalances in our essential nutrients.

The nutrient deficiencies I most often see are: The B Vitamins, Vitamin D, and Omega 3 fish oils. I see this in every patient who is either new in my practice or who has decided to go on a supplement fast to test their dietary nutrient supply. It is consistently predictable that I will find these deficiencies when we review their routine bloodwork, despite age, sex, or dietary pattern (vegan, carnivore, omnivore...). Of course, on more in-depth nutrient testing there are typically many more nutrient deficiencies.

Why the B vitamin deficiencies? As with any deficiency there can be genetic causes. Genomic testing can reveal mutations in nutrient receptors, nutrient transporters, and nutrient metabolism. If present, you may need

more of certain nutrients than the "average person." There can also be a lack of dietary intake. In my practice there are many people who have chosen a gluten-free diet. Gluten is a component of wheat and other grains. Because of widespread nutrient deficiencies (especially the B vitamins and iron), the US government began "fortifying" flour and grains with these nutrients in 1941. And while gluten-free can be a good choice (e.g., in celiac disease and non-celiac gluten sensitivity), people who don't have another dietary source of B vitamins will be missing the Bs they used to get in their morning cereal or bagel, lunchtime sandwich bread, and after dinner slice of cake.

And how many of us have taken antibiotics? Sometimes repeatedly or for extended periods of time. Antibiotics (and possibly many other "new to nature" molecules in our foods) are an environmental stressor of B vitamin deficiency. A single course of antibiotics can deplete the B vitamin producing bacteria in the gut, creating vitamin deficiency that typically affects one's ability to make energy. A combination of some degree of these factors — genetic, low dietary intake and environmental stressors (like antibiotic use) must be common. And since the B vitamins work as a team, supplementing with specific Bs is not sufficient. I always recommend a B complex containing activated forms of all the B vitamins, taken with a meal.

Where does all the Vitamin D deficiency come from? Since food sources of Vitamin D are few (fatty fish, fortified dairy, egg yolks), most of us depend on skin exposure to ultraviolet (UVB) radiation from the sun to give us Vitamin D. There are many reasons though, why sun exposure is not giving us what we need. In North America, at latitudes above 37 degrees north, Vitamin D exposure

from sunlight is negligible in the winter months. On the east coast, Richmond, Virginia sits at this latitude. North of Richmond, the angle of the sun during winter is too low for sufficient ultraviolet (UVB) radiation to reach the earth's surface. Getting sunlight in the morning in the winter certainly has other health benefits, but Vitamin D absorption is not one of them. In the summer Vitamin D can be absorbed, but sunscreen, clothing, and even our own skin tan will prevent Vitamin D absorption. Since melanin acts as a natural sunscreen, people with more melanin (deep tans or dark skin) will need more time in the summer sun in the northeast US (up to 3 - 10 times longer sun exposure than lighter skinned individuals) to get adequate Vitamin D. That would be a risk for skin cancer. For bone health and immune benefits, I like to see 25-OH Vitamin D blood levels between 60 and 70 ng/mL. Daily Vitamin D supplements from 1000 to 5000 IU are needed depending on the season, sun exposure time, skin color, clothing and use of sunscreen. Vitamin D should be taken with a meal for better absorption and the added Vitamin K in many supplements gives extra benefits. Measuring blood levels is the only way to know if you are over or under supplementing because of all these variables. Not supplementing however, will show up as Vitamin D deficiency.

I also see low Omega-3 fatty acid (fish oil) deficiency — mostly coupled with Omega-6 fatty acid excess. Most people don't eat fish frequently these days; it's expensive and river/ocean pollution causes concerns that toxins bioaccumulating in the large fish affect our health. Even people who eat salmon three times per week do not get adequate blood levels of Omega-3 fatty acids. Just as common is the excess Omega-6 fatty acids we ingest from the cheap

oils used to prepare our eat-out, take-out and packaged/processed foods. Structurally, these fatty acids comprise a very large percentage of the membrane that surrounds every cell in our body. Functionally, Omega-3s and 6s are messengers recruiting other cells to increase inflammation for healing (Omega-6s) and to stop inflammation when it is no longer needed (Omega-3s). The balance of Omega-6/3 in my lab should be less than 11 and I rarely see that. I often see it over 100! The Omega-3 Index is the percentage of Omega-3 fatty acids that should be in each cell membrane. That number should be in the 8 - 12% range. I often see that number below 5! There are different subtypes of Omega-3 fatty acids that are quantified on a supplement label. The EPA is more anti-inflammatory in its function and the DHA is more structurally involved in the eyes and the brain. They should both be listed and in somewhat equal amounts. I am partial to the Triglyceride forms of fish oil supplement because my observation is that they are better absorbed.

So that's it. It's just so curious that so many people I see are deficient in these: B, D, and fish oil. Better make sure you are not. They are important nutrients. If they are not in your diet, supplement them.

Dr. Kate Thomsen's office for holistic health care is located in Pennington, NJ. She is trained in Family Medicine, and Board Certified in Integrative Medicine. She is an Institute for Functional Medicine Certified Practitioner. She has been practicing Functional Medicine for 26 years. For more information see www.drkatethomsen.com or call the office at 609-818-9700.