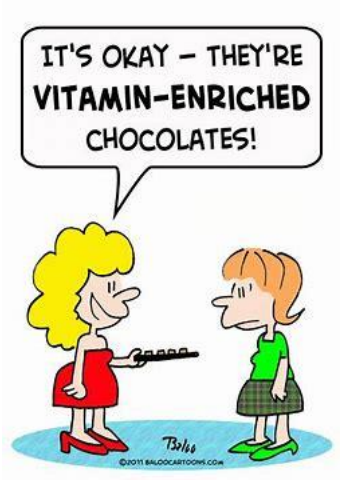
TTIPS VOL. 12/23 – INSIGHTS
- Vitamin D and Your Health –



INTRODUCTION

Depending on how often, how hard, and how far, you ride, you deplete your body's nutritional stores. One very important nutritional resource for your body is vitamin D. I was told by a cycling coach that vitamin D is a "gateway" vitamin because so many other nutrients need the presence of vitamin D to enable their benefits.

I thought you might be interested in this article regarding the big "D" that I found in Bicycling.com. Enjoy.

The Benefits of Vitamin D for Your Health and Performance

LEARN MORE ABOUT THE "SUNSHINE VITAMIN," AND WHY YOU NEED TO MAKE SURE YOU'RE GETTING ENOUGH OF IT.

BY TANEIKA DUHANEY
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Summer is officially here, and the cycling season is at its peak. Though the sun is out, many athletes will not get enough of the "sunshine vitamin" to ensure peak performance and to keep injuries at bay. In fact, the Cleveland Clinic estimates that more than 40 percent of the U.S. population is vitamin D deficient.

Vitamin D, an essential micronutrient, is responsible for many health processes, including building bones, supporting muscle health, and boosting the immune system. That's why you need to make sure you get enough of it—but many people don't. "Vitamin D [deficiency] is extremely prevalent within the general population and there are several considerations that would make this just as likely in athletes," explains Pensacola, Florida-based dietician and cycling coach Namrita Brooke, Ph.D., R.D.N.

Living and working indoors limits our exposure to sunlight. "Sunscreen, clothing, and training outdoors in the early morning or evening can also reduce UC exposure making the possibility of vitamin D insufficiency more likely," says Brooke.

Kristen Arnold, R.D.N, a dietician and cycling coach based in Fort Collins, Colorado also suggests athletes may be more prone to vitamin D deficiency due to their high activity level.

What is vitamin D?

Vitamin D is a fat-soluble vitamin that we "obtain through food, but we can also synthesize it in our skin, in much greater amounts, when exposed to the UV light from the sun," explains Brooke.

While vitamin D is called a "vitamin," the Endocrine Society defines it as a prohormone A prohormone is a "substance that the body converts to a hormone." Brooke explains that vitamin D "is thought of as having 'hormone-like' actions because vitamin D receptors are found in many areas of the body, allowing vitamin D to have widespread actions and effects within bone and muscle, the immune system, and even glucose metabolism."

What role does Vitamin D play in the body?

One of the most well-known functions of vitamin D is "bone development and injury prevention," explains Arnold. Vitamin D helps the body absorb calcium and phosphorus to build stronger bones. Healthy bone mass is critical for preventing injury, especially in cyclists, states Brooke.

Though vitamin D may not cure any disease it's important for immune function and regulating the inflammatory response, so maintaining optimal vitamin D levels makes you less susceptible to everything from the common cold to covid-19. In fact, a meta-analysis published in *Medicine* in 2019, involving more than 20,000 individuals, found an association between vitamin D deficiency and an increased risk of community-acquired pneumonia.

What's more: "Studies have shown a direct correlation between how you recover from COVID-19 and vitamin D deficiency," states nurse practitioner Jennifer Lynette Williams, D.N.P. For example, a PLoS one study published in 2022 found that patients with vitamin D deficiency were 14 times more likely to have severe or critical COVID-19. Also, a meta-analysis published in *Epidemiology Health* found that those with low serum vitamin D levels were nearly twice as likely to contract COVID-19. It's important to note, though, that both of these studies showed an association between vitamin D and COVID-19, rather than a cause and effect.

"Vitamin D offers some protection in making your immune system robust and aiding you in fighting off most disease states," Williams says.

The Health Benefits of vitamin D

Because of the vital role vitamin D plays in maintaining your well-being, getting enough of it offers several health and performance benefits. A 2016 research paper says that vistamin D receptors—or points where your body accepts vitamin D—are found in *nearly all* cells in the body. So it can play a key role in many bodily functions.

Improves Bone Health

"Our body uses vitamin D to make bones," explains Williams. Healthy vitamin D levels can prevent "osteoporosis and osteopenia—a loss in bone mass and density that increases the risk of bones breaking, two of the most commonly known effects of vitamin D deficiency." Both conditions can contribute to "bone fractures, hip fractures , and overall bone health as we age."

A study published in 2017 in the *Journal of Obstetrics & Gynecology Science* concluded that inadequate calcium intake and vitamin D deficiency could increase a postmenopausal woman's risk of osteopenia and osteoporosis, particularly in those ages 45 to 70.

Supports Lean Muscle Mass

In addition to bone health, vitamin D may help increase lean body mass. A study published in the *Annals of Nutrition & Metabolism* in 2019 found that healthy adults who supplemented with vitamin D over the course of one year significantly improved their lean body mass and body fat percentage. Similarly, a study published in *Nutrition & Metabolism* in 2021 found that athletes who took vitamin D supplements and were not able to work out because of COVID-19 experienced significantly less weight gain compared to athletes who did not supplement and also did not work out.

In addition to lean muscle mass, vitamin D may also support muscle strength. "Because muscle tissue also has vitamin D receptors, vitamin D can also possibly have a significant influence on muscular strength, performance, and injury prevention," explains Brooke.

Improves Athletic Performance

The lack of vitamin D has been shown to reduce athletic performance. Williams explains that "for most patients with vitamin D deficiency, the most common complaint is fatigue —lack of energy or lack of endurance." In such instances, Williams orders a vitamin D lab to identify whether a patient is vitamin D deficient.

Williams' course of action aligns with a *Journal of Physical Activity and Nutrition* scientific review published in 2021 that found vitamin D can "significantly affect physical performance and musculoskeletal injuries in athletes." The review points to vitamin D receptors in skeletal muscles and their relation to muscle function for the mechanisms behind vitamin D's role in muscular performance. Researchers write "vitamin D may potentially affect muscle protein synthesis, neuromuscular control, and type II muscle fibers," with the latter two playing an important role in force and rapid muscle contraction—both important for power. Researchers also point out vitamin D's role in endurance but say the mechanisms behind that are unclear.

Arnold explains that vitamin D is essential for both aerobic and anaerobic performance as it plays a role in the ATP energy pathway (how your body converts food into the energy needed for physical performance). To that end, vitamin D-deficient athletes may have suboptimal performance.

How much vitamin D do you need?

Williams cautions that how much vitamin D someone needs is "multifactorial." "It depends on how much sun exposure you get, your natural food intake or sources of vitamin D, how quickly you absorb [the vitamin], and how quickly your vitamin D levels decrease," she explains.

As a general guideline, the National Institutes of health (NIH) recommended dietary allowances (RDAs) for males and females—including pregnant and lactating persons—14 to 70 years of age as 600 IU. (The RDA increases to 800 IU for adults over the age of 70.) For patients who have difficulty maintaining their vitamin D levels, Williams suggests 1,000 to 3,000 IU per day. Most supplements you'll find include vitamin D3. That's because, according to the NIH, both vitamin D2 and vitamin D3 raise serum levels, but most evidence shows that vitamin D3 increases serum levels to a greater extent and maintains these higher levels longer than vitamin D2

What other factors affect vitamin D levels?

How much vitamin D is in your diet and how much sun exposure you get are only two factors that affect your vitamin D levels. Your skin color plays a significant role in your body's ability to naturally absorb vitamin D.

People with lighter skin tones are often advised to wear sunscreen or sleeves to prevent sunburn. These recommendations reduce the body's ability to absorb the sun's rays. People with darker skin tones are also advised to wear sunscreen; however, the melanin in their skin acts as a natural UV blocker. "The melanin in our [darker] skin is a gift and a curse. It does have an innate UV blocker, so it's much harder for us to absorb vitamin D from the sun and maintain adequate vitamin D levels," explains Williams.

Research backs up that race is a significant risk factor for vitamin D deficiency, with African American adults having the highest prevalence, and Hispanic adults also at elevated risk.

What are the best food sources of vitamin D?

According to the NIH, few foods naturally contain vitamin D, which is why, Arnold recommends, "supplements and daily sun exposure" to increase and maintain optimal vitamin D levels. However, there are a few foods that will help to support your vitamin D intake. The U.S. Department of Agriculture, Agricultural Research Service recommends the following:
Non-fortified sources:

- **Salmon (570 IU per 3 oz)**
- **Tuna fish (70 IU per 3 oz)**
- **Cod liver oil (1,360 IU per 1 tbsp)**
- **Dairy milk (120 IU per 1 cup)**

Fortified sources:

- **Almond milk (100 IU per 1 cup)**
- **Flax Milk (100 IU per 1 cup)**
- **Cereal (80 IU per serving)**

The bottom line on vitamin D intake

Vitamin D is critical for our bodies to perform optionally. As with all things, more does not always mean better. Since vitamin D is used for so many functions, Williams notes that "it will be very, very difficult even if you are an avid outdoor enthusiast to overdose or develop a toxicity to vitamin D. You would have to take 60,000 IU a day for several months." Though this seems impractical, it is possible. Arnold cautions that "there is an upper limit to intake, so proceed with caution."

The only way to determine your vitamin D level is from a blood test, which is best done at your doctor's office. However, several at-home testing companies (Everlywell, InsideTracker, and myLabBox) offer vitamin D testing.

Regardless of the option you choose, it is important that you identify your current vitamin D status, determine if you have optimal or deficient levels, and outline a plan with a dietician or medical provider on ways to maintain or increase your vitamin D levels.

That all for now. See you next time when we talk about Vitamin D and Dementia. Until then, Make Every Ride Epic,

Darryl