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### Dangerous Nutrients

Would you take a pill that hasn't been FDA approved? If there wasn't scientific research of long-term use, would you continue to take it? What if there was no conclusive research suggesting it was effective? America says yes!

While perusing the supplement aisle of your local Kroger, you might have seen melatonin. The bottle probably touted its contents as a "natural sleep aid" with a little asterisk on the back, saying there has been no scientific research to support that claim. The problem is, people don't care about the asterisk. They might not even see it. They want a "natural" solution to their sleep issues. It's natural so it's healthy, right? Guess what else is natural? Arsenic.

Melatonin is a pineal hormone that regulates your circadian rhythms. It's responsible for helping your body figure out when it's night and day. Your body's melatonin production starts to increase when it gets dark, starting a chain reaction that makes you tired (Reiter). Melatonin is an extremely popular supplement. You can buy a month's supply at your local grocer for ten dollars. As the bottle suggests, melatonin is used as a substitute sleeping pill. Its use isn't regulated, and pills can contain upwards of three thousand percent of what your body naturally produces. Due to its popularity, melatonin has been studied, but no long-term information is available. Short-term studies suggest "melatonin is not effective in treating most primary sleep disorders with short-term

use.” (Buscemi) You might be risking more than your money when you take melatonin frequently.

Scientists have found that people who take melatonin daily become dependent on it, as their body gradually stops producing it naturally to save energy (Buscemi). As the bottle said in its tiny disclaimer, no studies have concluded that melatonin is good for sleep. What they have found is that melatonin mimics estrogen. It ties up estrogen receptors, decreasing the amount of estrogen your body can use. This can cause reproductive issues in women. Non-synthetic hormones can lead to biological contamination from horizontal gene transfer. Additionally, people who self-medicate with melatonin could be masking deeper sleep issues that require attention. It’s like using Sensodyne to avoid tooth pain caused by an unidentified cavity. You probably didn’t know all that when you picked up the bottle of melatonin.

Supplements are a multi-billion dollar industry. You can find at least 50 different kinds of vitamin supplements from Adenine to Zinc at your local grocery store. If you aren’t suffering from a health condition, you might want to take supplements to enhance your diet. If you could get all the nutrients your body requires from a simple pill, why wouldn’t you? The multivitamin, a pill containing most of a person’s daily nutritional requirements, is as close as we’ve gotten to the fabled “food pill” of science fiction. Most of the people who take multivitamins and dietary supplements are healthy and just want to make sure they’re getting all the nutrients they need. That’s the problem.

Supplements are supposed to be taken to ameliorate a nutritionally deficient diet. Those with malnutrition can benefit from supplement use. However, people who care enough about their health and have the money to buy vitamin supplements are usually the

group that sees the smallest gain from supplement use. This is simply because their diets aren't deficient in a certain vitamin or mineral. Nutrients are everywhere: injected into your bread, meat, milk, water, and energy drinks. For today's food manufacturers, drenching products in supplements is something of a trend. This leads to unintentional supplement ingestion, which adds to your daily intake. The diversity of a modern diet makes it easy to meet dietary requirements (Schroder). In light of this, why are "more than 40% of Americans" (Van Thyne et al) taking supplement pills? Even when there is no deficiency, many take vitamins simply because it makes them feel better about their health choices. They see it as health insurance. This attitude is dangerous. When you are already guaranteed to get all the nutrients you need, why worry about eating healthily? Have a cheeseburger with that vitamin water!

So what's the problem with taking more than you need? If vitamins in nutritional food are healthy, why not take more of them? The answer is simply that large doses of vitamins are unhealthy. In 2010 alone, almost a hundred thousand cases of hypervitaminosis were reported to the poison control center (Bronstein). On some level, vitamin poisoning happens because people don't understand the difference between fat and water-soluble vitamins. It's okay to indulge in a 5000% Daily Value B-complex pill every so often, but don't try that with vitamin A. Fat-soluble vitamins like vitamins A, D, E and K accumulate in your liver and fatty tissue over time. Water-soluble vitamins, like vitamins B and C, quickly leave the body and need to be replenished daily.

Megadoses of fat-soluble supplements can increase mortality (Hsu et al) and are associated with higher cancer rates (Abnet). For example, you're supposed to get up to six hundred international units (IU) of vitamin D per day. Four thousand IU is the "safe" upper

limit. More than this can cause overcalcification of the bones, kidneys and liver, and symptoms might not appear for years. You won't find that much vitamin D in the produce section. Salmon is high in vitamin D, but you would have to ingest a kilogram in one sitting to get 10,000 IU –people take more than that in one little pill! This damage isn't necessarily limited to megadosing: a 2001 study spanning 30 years concluded that daily, long-term ingestion of a multivitamin containing normal amounts of vitamin A weakened bones and led to up to a seven hundred percent higher risk of hip fractures (Melhus). The body is a complex system that we don't fully understand. Why inundate it with vitamins and minerals when we're not sure of the consequences?

There's no denying that scientific claims can be wrong. Data can be misinterpreted and causal relationships are often incomplete. Every few months, a study comes out telling us that taking some supplement might benefit us. Sooner or later, a study will come out contradicting that study. This leaves people confused about what to believe. Recently, it was discovered that livers love coffee. Once thought to be detrimental to liver function, coffee intake was found to correlate with a lower liver enzyme count (A high liver enzyme count means liver damage). Some people are waiting for science to catch up, believing their supplement use is improving their health. Some think the recommended daily value system is just as arbitrary as deciding which brand of socks to buy. This can only be described as an argument of faith: believing in something without conclusive supporting evidence. In the case of unnecessary supplementation, the risk of negative consequences outweighs the potential benefits. Many studies suggest that over supplementation in healthy adults is detrimental, and there is little scientific evidence that taking too much of a vitamin will make you healthier.

Should you take supplements? Ask a doctor! It's your choice. It all boils down to your personal health issues. Do you have scurvy? Take some vitamin C. Are you jet lagged? Take melatonin for a few nights. Just be informed. Consider improving your diet first. Be wary of the health consequences of what you're ingesting, and know that too much of a good thing isn't always a good idea.

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### Writer's Reflection

I'm a supplement nut. I have at least a hundred dollars worth of dietary supplements in my apartment. Each day, I take a multivitamin, vitamins B, C, and D, coq10, Calcium, Magnesium, and Zinc. The list goes on. I feel better about my health when I take supplements.

Recently, my mom gave me 5000 IU vitamin D pills. Whoa, mom! Don't you know that's an unhealthily high dosage? My mom disagreed. She told me that the daily value system was invalid and she believed taking vitamin D in high doses was good for me and I should partake. This bothered me. How much do other people know about the supplements they take? How much do *I* know about this morning's dose of supplements sitting in my stomach? The answer was "not much".

I felt stupid. I enjoy following science, and try to make logical choices. I took a bunch of vitamins over the years without really thinking about how healthy they would be for me, or how they could affect my future. Over the years, I'd looked up *some* of the supplements. I took melatonin for a while until I did substantial research to determine it wasn't a good idea.

I chose this topic to help educate others about taking supplements, and for myself to learn more about the topic. I chose this audience (general, healthy American majority interested in health), because that's who's most affected by the supplement industry. I hope to share my paper with my family and friends so they can decide whether they want to continue using supplements.

In terms of craft, I'm pleased with my paper. It has a voice, it has humor, and the argument is well-supported. I added a lot of hyperboles to satirize the thoughts behind supplement use. I addressed the reader to keep him or her engaged, and asked a lot of questions to foster reflective thought. I gave a lot of examples, which helps illustrate my points in the reader's mind. I think it's important to include examples, ridiculous or not, in an argument to help the reader understand what you mean.

In future papers, I hope to draft more. I tend to do one or two drafts before turning a paper in, and I believe my writing skills need to be further developed.