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## **What's the difference between vitamins and minerals?** <sup>[1]</sup>

Dear Alice,

What is the difference between vitamins and minerals? It seems like most Americans are taking a lot of vitamins more than they need to. Is it good to take a lot of vitamins?

### **Answer**

Dear Reader,

When it comes to vitamins and minerals, it seems that it's possible to have too much of a good thing. Both vitamins and minerals are considered micronutrients — meaning they're needed by the body only in small amounts (think milligrams or micrograms per day). There are, however, some differences not only between vitamins and minerals, but also among them (read on for more information). Despite their role in carrying out necessary processes in the body, there's a line between getting enough and getting too much. To reduce the chances of ingesting more than needed, eating a balanced and nutritious diet, as opposed to taking them in supplement form is typically recommended. That said, there are exceptions to this advice, such as folks with certain conditions who may need more of certain nutrients (more on this later).

To delve a bit deeper into answer your first question, Reader, though vitamins and minerals are both micronutrients, they're different. Vitamins are organic and all are essential to the body, whereas minerals are inorganic elements and only some are essential for key body processes. Vitamins are vulnerable to heat, light, and chemical agents, which means cooking, food preparation, processing, and storage need to be appropriate to preserve vitamins in food. Minerals, on the other hand, are more stable to food preparation, but mineral loss can occur when they bind to other substances in foods. For example, when there's excess sodium in the body, calcium latches on and is excreted along with the excess sodium, thereby reducing the amount of calcium available in the body.

Taking a closer look at vitamins, there are two types categorized by how they're absorbed: water-soluble and fat-soluble. There are nine different water-soluble vitamins that require water for absorption: vitamin C and the eight B vitamins (thiamin, riboflavin, niacin, vitamins B<sub>6</sub> and B<sub>12</sub>, folate, biotin, and pantothenic acid). If there's an excess of these vitamins in your body, they can be excreted through urine. On the other hand, the fat-soluble vitamins such as vitamins A, D, E,

and K require fat for absorption and are stored in the adipose tissue. Having these vitamin stores allows the body to tap into these reserves when needed. Unlike those that are water-soluble, fat-soluble vitamins can accumulate to toxic levels because they're not excreted as easily.

Minerals can also be further broken down into different categories: major and trace. Major minerals are needed in 100 milligrams per day or more, compared to trace minerals that require much smaller amounts. There are 16 minerals that the body needs, with seven that are major (calcium, phosphorus, potassium, sodium, chloride, magnesium, and sulfur) and the remaining nine that are trace (iron, iodine, zinc, chromium, selenium, fluoride, molybdenum, copper, and manganese). These minerals play vital roles in many parts of the body. For instance, calcium is used to prevent osteoporosis and iron is used to prevent anemia. Other minerals, such as lead, are not essential nutrients because they can cause harm by disrupting normal bodily functions and processes (i.e., lead poisoning).

Although each of the vitamins and minerals have unique roles and functions in the body, research supports that the body has a natural maximum capacity for these nutrients. As a result, taking more dietary supplements (such as multivitamins) than needed may lead to nausea or other side effects as your system works to get rid of the excess. In addition, some dietary supplements can interact with prescribed medications, so it's wise to make mention of them when asked about current medication or supplement use during medical exams. Before you add any new supplements to your diet, it's also recommended that you speak with your health care provider to ensure there are no complications with existing medications or conditions.

While ingesting excess micronutrients may be one concern, you also want to make sure that you're getting enough, too. To get help you start planning a well-balanced diet, check out [ChooseMyPlate.gov](https://www.choosemyplate.gov) [2] for information on the health benefits, nutrients, and vitamins available in different foods. Talk with a health care provider or a registered dietician may help determine whether benefits may be reaped from taking dietary supplements to increase or decrease the amounts of certain vitamins and minerals, particularly for those who are pregnant, have certain medical conditions, or who have dietary restrictions. For additional information about micronutrients and dietary supplements in general, check out other Q&As in the *Go Ask Alice! Nutrition and Physical Activity* [3] archives, the [National Institutes of Health \(NIH\)](https://www.nih.gov) [4], and the [U.S. Food and Drug Administration \(FDA\)](https://www.fda.gov) [5] websites.

Here's to finding the balance that's right for you!

Alice!

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