

## - Vitamins / Minerals in human nutrition

### Study weighs in on the benefits of supplements

For most healthy adults, key vitamins and minerals can be obtained from a balanced diet

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A massive meta-analysis from the Journal of the American Medical Association of 84 studies on vitamins and supplements has just been published. The aim of the review was to assess the benefits or harms of vitamins and minerals in healthy, nonpregnant adults in preventing cardiovascular disease and cancer.

It looked at beta carotene – the precursor to vitamin A – and at vitamins D and E. The researchers found that taking beta carotene supplements was linked to an increased risk of lung cancer and cardiovascular mortality.

They did not find an increased nor decreased risk for all-cause mortality, cardiovascular disease or cancer associated with taking vitamins D and E. In summary, no benefit.

Based on these findings, the United States Preventive Services Task Force recommends against the use of beta carotene or vitamin E supplements for the prevention of cardiovascular disease or cancer, and states that there is insufficient evidence to assess the benefits or negative effects of multivitamins or other single or paired nutrient supplements for the prevention of cardiovascular disease or cancer.

This is quite a definitive statement, given that Americans spent US\$50 billion on multivitamins and supplements in 2021. Conventional wisdom argues that multivitamins or nutrient supplements still have a role in certain populations such as older adults, pregnant women or special dieters. But there is a lack of definitive consistent evidence for proven benefits of multivitamins in any of these groups.

On an individual level, a better approach remains to identify the specific nutrient deficiency and address it with specific fortified foods or diet.

For example, we continue to recommend pregnant women take a prenatal vitamin, but the quality of evidence isn't very high that this supplement reduces the risk of a fetus being small for gestational age or developing neural tube defects.

It's more likely that the folic acid present in the prenatal vitamin is the primary actor in healthy fetal development. So it may make more sense for pregnant women to take folic acid only, or eat more cereal-grain products fortified with folic acid.

Vitamin D is key not only for bone health and immunity, but for mood and a healthy circadian rhythm. Exposure to sunlight converts precursor molecules in our skin to the active form of vitamin D we benefit from.

Early morning sun is best. Doing that right after awakening sets a healthy circadian rhythm for the day and also helps you avoid more harmful UVA and UVB rays that are present starting in the early afternoon.

Fatty fish like tuna and salmon are high in vitamin D. Egg yolks and mushrooms also contain good amounts of vitamin D. Note that the recommended daily allowance of vitamin D is 400-800 IU/day – most adults, however, need about 1,000-2,000 IU of vitamin D3 a day, depending on how much sun they get.

Magnesium is important for blood pressure control and blood glucose control. It's a key cofactor for over 300 enzymes that regulate protein synthesis and nerve function, among other things. Magnesium is required for the synthesis and activation of vitamin D, such that if you're low in dietary magnesium, it doesn't matter how much vitamin D you supplement with.

A diet of refined grains and processed foods is a poor source of magnesium. An adequate amount of magnesium can be obtained from dark-green leafy vegetables, almonds, legumes like black beans and whole grains.

Omega-3 fatty acids form a key part of the structure of every cell we have. They are an "essential" fat – meaning the body cannot generate its own and we must obtain it from diet.

These essential fatty acids are a major component of the brain, retina, skin and nails. They are involved in conducting signals between cells and are a source of energy.

While a 2012 meta-analysis found that the heart-protecting effects of fish oil were not as strong as we once thought, there is likely a benefit in those at high risk for cardiovascular disease. Mackerel, salmon and cod liver oil boast some of the highest levels of omega-3.

There are a total of eight essential B vitamins. Primarily, they function in converting carbohydrates, fats and proteins into energy. Fifteen per cent of the US population are deficient in vitamin B12, for example, particularly those who practise a vegan or vegetarian diet. Those who suffer from digestive disorders or who have had gastrointestinal surgery might also be high risk for vitamin B deficiency.

The main sources for vitamin B complex include chicken, organ meats, eggs, seeds, nuts and fortified cereals and grains.

In most healthy adults, key vitamins and minerals can be obtained from a well-balanced diet and daily early morning sunlight. Supplementation might only be necessary in those who cannot get enough sunlight or who are elderly or suffer from high-risk conditions that make it difficult to consume vitamins from diet alone.