

# Selenium supplements could be harmful to people who already have enough selenium in their diet: study

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Although additional selenium might benefit people who are lacking in this essential micronutrient, for those who already have enough selenium in their diet (including a large proportion of the USA population), taking selenium supplements could be harmful, and might increase the risk of developing type-2 diabetes, concludes a new review of the evidence published Online First in *The Lancet*.

"The intake of [selenium](#) varies hugely worldwide. Intakes are high in Venezuela, Canada, the USA, and Japan, but lower in Europe. Selenium-containing supplements add to these intakes, especially in the USA where 50% of the population takes [dietary supplements](#)", explains Margaret Rayman from the University of Surrey, Guilford, UK, author of the study.

Selenium is a natural occurring trace mineral found in soil and foods and is essential in small amounts for good health. Low selenium intake or status (levels in the blood) has been linked with an increased risk of death, poor [immune function](#), and [cognitive decline](#). Higher selenium intake or status has been shown to enhance [male fertility](#), have antiviral effects, and provide some protection against cancers of the prostate, lung, colorectal system, and bladder.

But the evidence also suggests that selenium has a narrow therapeutic range and at high levels might have harmful effects such as increasing

the risk of type-2 diabetes.

Over the last 10 years, the use of selenium supplements has become widespread, largely due to the belief that selenium can reduce the risk of cancer and other diseases. Selenium supplements have been marketed for a multitude of conditions largely based on the results of [observational studies](#). However, findings from clinical trials to confirm their efficacy have been mixed.

The Review reveals that studies in different populations with different selenium status and [genetic background](#) have produced divergent results.

According to Rayman, these conflicting results can be explained by the fact that supplementation with selenium, as for many nutrients, is only beneficial when intake is inadequate.

She notes that the greatest benefit from selenium supplementation is likely to be in people with low blood selenium levels. However, to date, the largest trials have been done in countries where selenium status is good (like the USA), and more trials are needed in populations with low selenium status.

The Review also suggests that the interaction between selenium intake or status and genetic background could be important—people could be more or less genetically receptive to the benefits of selenium-containing proteins (selenoproteins) in the body or to selenium supplements: "Since polymorphisms in selenoproteins affect both selenium status and disease risk or prognosis, future studies must genotype participants."

Rayman concludes: "The crucial factor that needs to be emphasised is that people whose blood plasma selenium is already 122 µg/L or higher—a large proportion of the US population (the average level in American men is 134 µg/L)—should not take [selenium supplements](#)."

However, there are various health benefits, and no extra risk, for people of lower selenium status (plasma level less than 122  $\mu\text{g/L}$ ), who could benefit from raising their status to 130-150  $\mu\text{g/L}$ —a level associated with low mortality."\*

Provided by Lancet

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