

Plant-sourced nitrate proves positive to human health

June 25 2024



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New research from Edith Cowan University (ECU) has found that nitrate from plant sources is associated with a lower risk of mortality while nitrate from other sources such as animal-based foods, processed

meat and tap water, is linked to a higher risk of mortality.

Nitrate, a compound found in vegetables, meat, and drinking water, has been the subject of debate due to its potential impact on health.

Emerging evidence suggests that dietary nitrate may play a role in preventing cardiovascular disease (CVD), dementia, and diabetes.

However, concerns about a potential link between nitrate ingestion and [cancer](#) have led to uncertainties surrounding the consumption of high-nitrate leafy green vegetables.

ECU's Dr. Nicola Bondonno led the project which has found that among 52,247 participants of the Danish Diet Cancer and Health Study, moderate to high intakes of plant and vegetable sourced nitrate were associated with a 14% to 24% lower risk of all-cause, CVD-related, and cancer-related [mortality](#). The work is [published](#) in the *European Journal of Epidemiology*.

While the research could not attribute plant-based nitrate as the sole contributor to human health, given that plants and vegetables contained a range of other protective compounds which themselves were associated with a lower risk of CVD, cancer and mortality, the research underscored the value of higher intakes of nitrate-rich vegetables to mitigate mortality risks.

The research also added to the growing evidence that there was no cause for concern regarding cancer risks from the consumption of nitrate-rich vegetables such as leafy green vegetables and beetroot.

Conversely, higher intakes of naturally occurring animal-sourced nitrate were associated with a 9% and 12% higher risk of all-cause, and CVD-related mortality, respectively. Higher intakes of naturally occurring animal-sourced nitrite, a compound formed from nitrate, were associated with a 25%, 29% and 18% higher risk of all-cause, CVD-

related, and cancer-related mortality, respectively.

Meanwhile, higher intakes of nitrate and nitrite from processed meat sources were associated with a 12% to 22% higher risk of all-cause and cancer-related mortality while only additive permitted meat-sourced nitrite was positively associated with CVD-related mortality.

Participants with a higher intake of tap water-sourced nitrate had a higher risk of all-cause and CVD-related mortality but not cancer-related mortality.

Dr. Bondonno, who is currently based at the Danish Cancer Institute, said that the source of the nitrate determined the body's reaction to the nitrate.

"In simplistic terms, nitrate can go down two different pathways when introduced into the body. One is to form a compound called [nitric oxide](#), which has been shown to improve [blood flow](#), lower blood pressure, and support overall cardiovascular health.

"But nitrate may also go down a second pathway, forming a group of compounds called nitrosamines, which are considered to be carcinogenic and are linked to cancer. It is thought that the antioxidant compounds in vegetables push nitrate towards the first pathway."

The advice resulting from the most recent research fits in with what is commonly known about the optimal human diet; eat more plants and less animal products and limit the amount of processed meats.

"The majority of fears around nitrate consumption have generally stemmed from concerns around cancer, but one of the most interesting findings from this research is that nitrate found in drinking water was more strongly linked to deaths from heart disease.

"Nitrate sourced from plants and vegetables are protective against the different kinds of mortality. But when [nitrate](#) comes from animal sources or tap water, it increases your risks, mainly of heart disease, but also of certain cancers."

More information: Nicola P. Bondonno et al, Source-specific nitrate intake and all-cause mortality in the Danish Diet, Cancer, and Health Study, *European Journal of Epidemiology* (2024). [DOI: 10.1007/s10654-024-01133-5](#)

Provided by Edith Cowan University

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