

Vitamin E and the multivitamin supplementation debate



What is vitamin E?

Vitamin E is an essential micronutrient that cannot be produced by the body itself. Due to changes in modern eating habits, it can be difficult to obtain the required amount of vitamin E through diet alone.

- *Vitamin E is a generic term for eight fat-soluble compounds found in nature, of which 'alpha-tocopherol' has the highest biological activity and is the most abundant in the human body.*
- *Symptoms of deficiency include peripheral neuropathy, muscle weakness, loss of muscle mass, problems with vision and other neurological disorders.*
- *The most important sources of vitamin E are sunflower seeds, vegetable oils, nuts, whole grains and wheat germ and there is also a limited supply in other seeds and green leafy vegetables.*
- *The most common fortified foods are soft drinks and some breakfast cereals. Vitamin E is also widely available in soft gelatin capsules or as chewable or effervescent tablets, as well as being found in most multivitamin supplements.*

Introduction

There has been much debate over the requirement for and efficacy of multivitamin supplementation in recent months. It is widely accepted that the simplest way of receiving essential nutrition is through a healthy and varied diet, however, a large proportion of the population in the Western world is not adequately nourished. The impact of low micronutrient intake is a major public health concern on a global scale.

Leading scientific experts have made strong arguments in support of the view that daily multivitamin supplementation is a safe, effective and low cost way to complement the diet of individuals and achieve the recommended intake of essential micronutrients.¹ However, claims have been made that there is little or no evidence to support the use of dietary supplements and these conflicting messages serve to confuse consumers.²

Hear from expert **Professor Maret Traber**, Linus Pauling Institute, Oregon State University:

"From my perspective, one of the most interesting areas of research is vitamin E and membrane repair, as it is likely to identify the actual reason why we require the micronutrient. Pathologic investigations have for decades identified that vitamin E deficient muscles show repeated injury and repair, but it is not clear why this happens. If research were to focus on the role of vitamin E in the functioning of membranes, receptors, rafts and signalling, the scientific community would have access to significant new information. This kind of research requires careful attention to physiologically relevant concentrations."

Vitamin E intake

The intake of micronutrients, such as vitamin E, is vital for health. Despite the proven biological function of vitamin E as a powerful antioxidant, global intake is inadequate and it is estimated that more than 90 per cent of the population in the US does not meet the dietary intake recommendations for vitamin E. Taking a supplement is a convenient way to secure intake, but debate on just how much vitamin E is needed to deliver the recognized functional benefits is ongoing.

- The current recommended daily intake varies according to the age, gender and criteria applied in individual countries.
- There is ongoing work to determine the appropriate assessment of vitamin E status and functionality and new biomarkers need to be identified, in order to define vitamin E adequacy and inadequacy more accurately.
- The Canadian and US governments recently reported that vitamin E has been selected to undergo dietary reference intake (DRI) review. Vitamin E was one of four nutrients selected from 26 nominations as requiring the in-depth review process that is undertaken for the establishment or revision of a DRI.

Did you know..?

- People should consume at least 15 mg or 22.4 IU of alpha-tocopherol per day, in order to benefit from decreased risk of mortality and chronic disease as well as to preserve the integrity of the cell membrane.
- Dietary survey data in the United States (US) indicates that the average intake of alpha-tocopherol from food is only 6.9 mg/day. This means that more than 90 percent of the US population does not currently meet the daily dietary recommendations for vitamin E.³

How does vitamin E address global health concerns?

DSM is currently engaging with a number of experts in the field of vitamin E research to address the need for further studies into the micronutrient. These partnerships allow members of the scientific community to discuss emerging research, and are part of DSM's work to highlight the low levels of vitamin E intake globally, and to better understand the health benefits that sufficient vitamin E can provide.

Alzheimer's type dementia

There are currently 35 million patients being affected by Alzheimer's type dementia worldwide, and the number is expected to quadruple by 2050.⁴ Vitamin E is important for proper neuronal functioning and the role of vitamin E supplementation in the prevention of neurodegenerative diseases is under investigation. Central to initial research is the overall finding that vitamin E may protect essential fatty acids in the brain from lipid peroxidation and that improved vitamin E status is protective for cognitive function.^{5,6} High plasma levels of vitamin E at

Did you know..?

A new paper has recently been published in Nutrition,¹⁰ which looks at the consequences of insufficient vitamin and nutrient supply on the aging brain. It concludes that the optimal supply of micronutrients plays a vital metabolic role in supporting the normal functioning of the brain and may help to delay the onset of Alzheimer's disease.

baseline have been associated with a reduced risk of Alzheimer's disease and increased vitamin E intake from foods is linked to decreased risk of developing Alzheimer's disease.^{7,8}

The Journal of the American Medical Association recently published a major study, which found that DSM's Quali[®]-E can slow the progression of Alzheimer's disease.⁹ As part of the trial, 613 patients with mild to moderate Alzheimer's disease were studied over a two year timeframe in the longest and largest study of its kind to date. Participants took

2,000 IU of vitamin E or a placebo. The vitamin E group showed a 19 per cent slower rate of decline in daily living skills compared to the placebo group. The participants that took vitamin E remained far more independent, relying less on caregivers for standard daily living skills and this made a significant improvement on quality of life.

Air pollution

The rising exposure to pollutants is associated with increased rates of cardiovascular and respiratory afflictions worldwide. Recent research has highlighted the potential of micronutrients, such as vitamin E, to combat respiratory inflammation, decreased antioxidant capability and the neurological symptoms associated with certain pollutants.¹¹

Hear from Associate Professor **Lisa Wood**, Centre for Asthma and Respiratory Diseases, University of Newcastle, Australia:

"Nowadays, diets are characterized by an increasing intake of processed or prepackaged foods. This dietary pattern results in a nutrient profile that is low in beneficial nutrients, such as antioxidants and omega-3 polyunsaturated fatty acids (PUFAs). As these nutrients protect against inflammation, populations are more susceptible to the damaging effects of pollutants, which can trigger chronic diseases such as asthma. Increasing the intake of antioxidants and PUFAs may reduce inflammation, providing opportunities for asthma management."

Fatty liver disease

Vitamin E supplementation can reduce the negative health implications of fatty liver disease. The results of several clinical studies suggest that the use of vitamin E is associated with a number of benefits in patients with non-alcoholic liver disease, including a decrease in aminotransferases and a reduction in fatty degeneration and inflammation.¹² In addition, vitamin E administered at a daily dose of 800 IU/day improves liver histology in non-diabetic adults with non-alcoholic liver disease.¹³ These findings have major public health implications because this disorder is a consequence of obesity, and in societies where more than half of the population is obese, fatty liver disease is pandemic.

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About DSM

As the world's largest supplier of vitamin E, DSM offers complete backwards integration and has a comprehensive portfolio of oil and dry forms, suitable for a wide range of applications. DSM is



leading an initiative – *Vitamins in Motion* – to highlight the critical role vitamins play in

overall nutrition and health. The campaign advocates for increased access, through innovative solutions, to the essential vitamins all people need to be healthy and well-nourished.

For more information and to access the latest news on vitamin E, visit www.dsm.com/vitamin-e

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