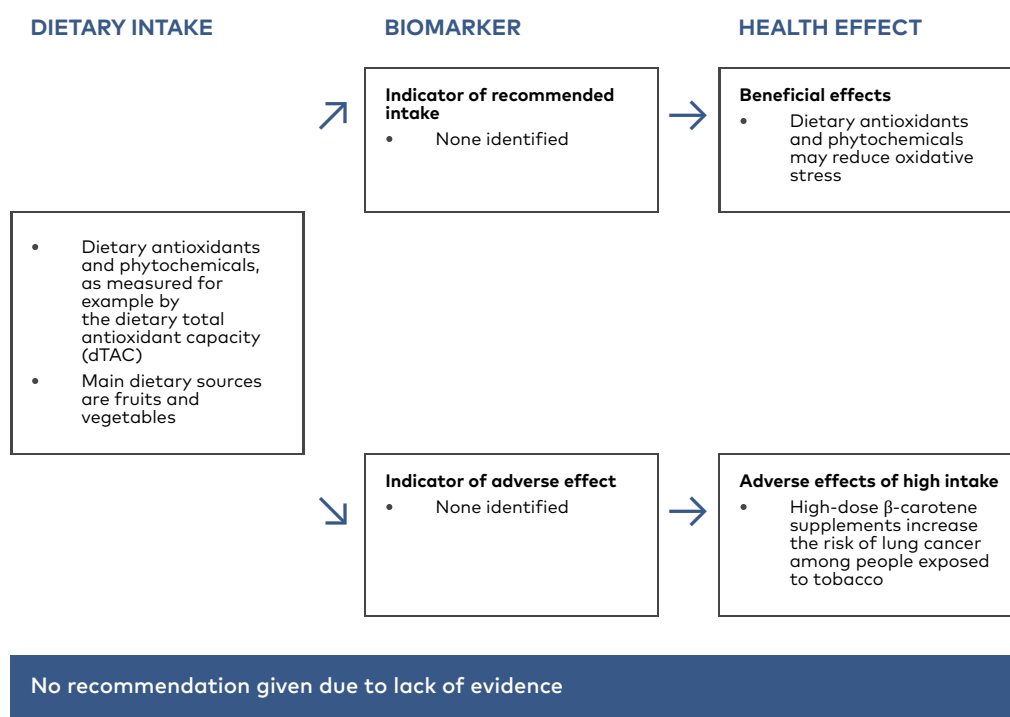


Antioxidants and phytochemicals



For more information about the health effects, please refer to the background paper by Mari Myhrstad and Alicja Wolk (Myhrstad & Wolk, 2023).

Dietary sources and intake. Fruits and vegetables are the main contributors to dietary total antioxidant capacity (dTAC). Only a few studies have assessed dTAC in Nordic and Baltic countries. Estimated median dTAC (assessed by oxygen radical absorbance capacity [ORAC] assay) from foods in Swedish males and females were median 14,025 and 12,353 $\mu\text{mol Trolox}$ equivalents/day, respectively. For Swedish girls and boys aged 8 y, estimated median dTAC was 10,397 and 9611 $\mu\text{mol Trolox}$ equivalents/day, respectively (Myhrstad & Wolk, 2023). Plasma TAC is considered a valid and reproducible biomarker of dietary intake. Fruits and vegetables contain not only antioxidants and phytochemicals, but are commonly high in water, low in energy, contain numerous nutrients, vitamin C, vitamin E, vitamin K, folate, potassium and are good source of fibre. See other summaries in this report for further discussions related to antioxidants and phytochemicals specific to specific foods (vegetables, fruits and berries) or nutrients with antioxidant capacity (vitamin C, vitamin E, β -carotene, and selenium).

Main functions. In plants, phytochemicals protect against pathogens and UV radiation, and provide colour and flavour. In humans, phytochemicals may affect biological functions via regulation of redox reactions, including antioxidative (scavenge free radicals, induce endogenous antioxidants), anti-apoptotic, anti-carcinogenic, anti-inflammatory, and anti-atherosclerotic properties, and modification of endothelial function and angiogenesis (Myhrstad & Wolk, 2023).

Indicator for recommended intake. No indicator was identified for setting any DRV. The WCRF considered high-dose β -carotene supplements to convincingly increase the risk of lung cancer among people exposed to tobacco/smoke (WCRF/AICR, 2018d).

Main data gaps. More research is needed on the role of phytochemical and antioxidant rich fruits and vegetables in oxidative stress related diseases, such as cancers.

Deficiency and risk groups. Risk groups may be individuals with very low intake of fruits and vegetables.

Dietary reference values. Reference values for specific antioxidants or phytochemicals beyond the ordinary dietary recommendations for vitamin C, vitamin E, β -carotene, and selenium cannot be given. High intakes of supplements with antioxidant properties, such as beta-carotene, increase the risk of all-cause mortality, and is therefore not recommended (O'Connor et al., 2022; WCRF/AICR, 2018d).