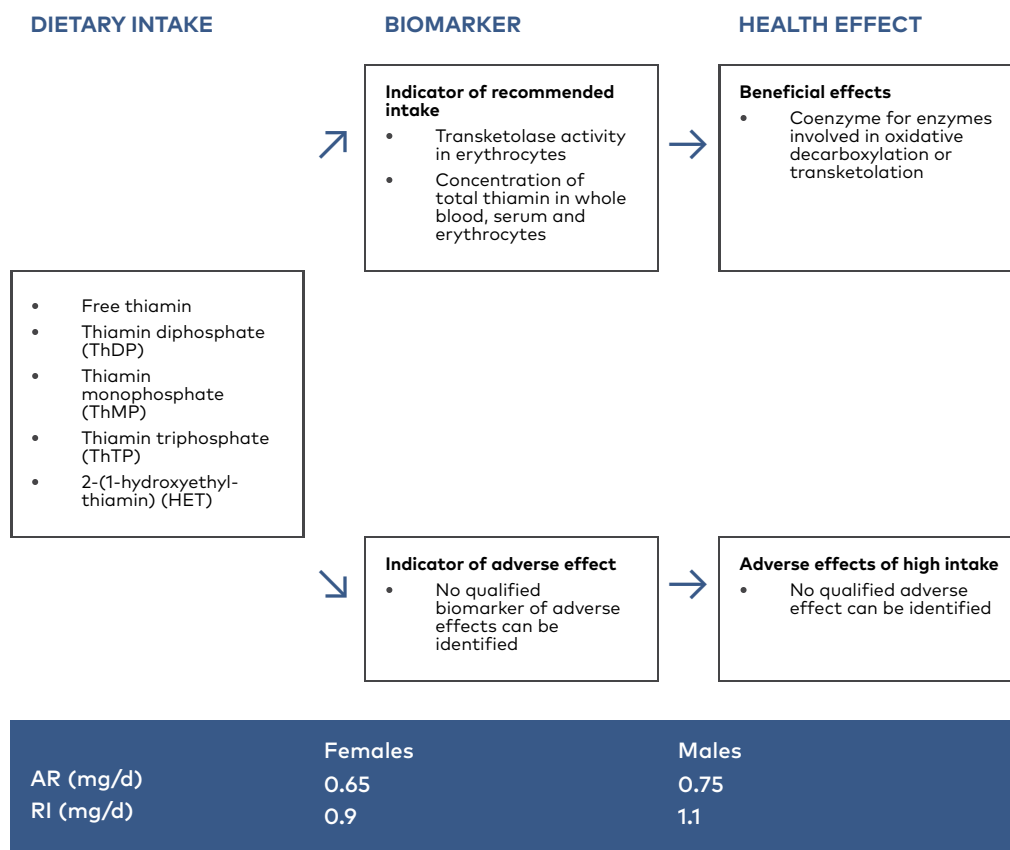


Thiamin (vitamin B₁)



For more information about the health effects, please refer to the background paper by Hanna Sara Strandler and Tor A. Strand (Strandler & Strand, 2023).

Dietary sources and intake. Thiamin (thiamine or vitamin B₁) is a water-soluble compound present in foods mainly as free thiamin and thiamin diphosphate (ThDP) (EFSA, 2016; IOM, 1998b; Strandler & Strand, 2023). Thiamin monophosphate (ThMP), thiamin triphosphate (ThTP) and 2-(1-hydroxyethyl-thiamin) (HET) are also present. Main sources in Nordic and Baltic diets are cereal products, meat and dairy products. The average thiamin intake ranges from 0.8 to 1.9 mg /d (Lemming & Pitsi, 2022).

Main functions. Free thiamin functions as the precursor for ThDP, which acts as a coenzyme for enzymes involved in carbohydrate and branched chain amino acid metabolism, and in energy-yielding reactions (EFSA, 2016; IOM, 1998b; Strandler & Strand, 2023).

Indicator for recommended intake. The enzymatic activity of transketolase in the erythrocytes and blood, serum and erythrocyte concentration of total thiamin can be used as biomarkers of thiamin intake (EFSA, 2016; IOM, 1998b; Strandler & Strand, 2023).

Main data gaps. Established cut-offs are lacking for the biomarkers (EFSA, 2016).

Deficiency and risk groups. Thiamin deficiency, which is uncommon, leads to beriberi with mostly neurological and cardiovascular manifestations. Wernicke-Korsakoff syndrome is a condition of severe brain function impairment caused by thiamin deficiency related to chronic alcohol abuse. People at risk of refeeding syndrome usually need additional thiamin administration for prevention of neurological, cardiac and pulmonary disturbances that can be fatal (Strandler & Strand, 2023).

Dietary reference values. Based on data from depletion–repletion studies in adults on the amount of dietary thiamin intake associated with erythrocyte transketolase activity coefficient <1.15 or with the restoration of normal activity, without a sharp increase in urinary thiamin excretion, AR is set to 0.072 mg/MJ for all life-stages. Assuming a BMI of 23 kg/m² and PAL 1.6, this corresponds to AR of 0.6–0.7 mg/day in adult females and 0.7–0.8 mg/day in males. RI: 0.1 mg/MJ (corresponding to 0.9 mg/day (females), 1.1 mg/day (males)). Not sufficient data to derive UL (EFSA, 2016; Strandler & Strand, 2023).