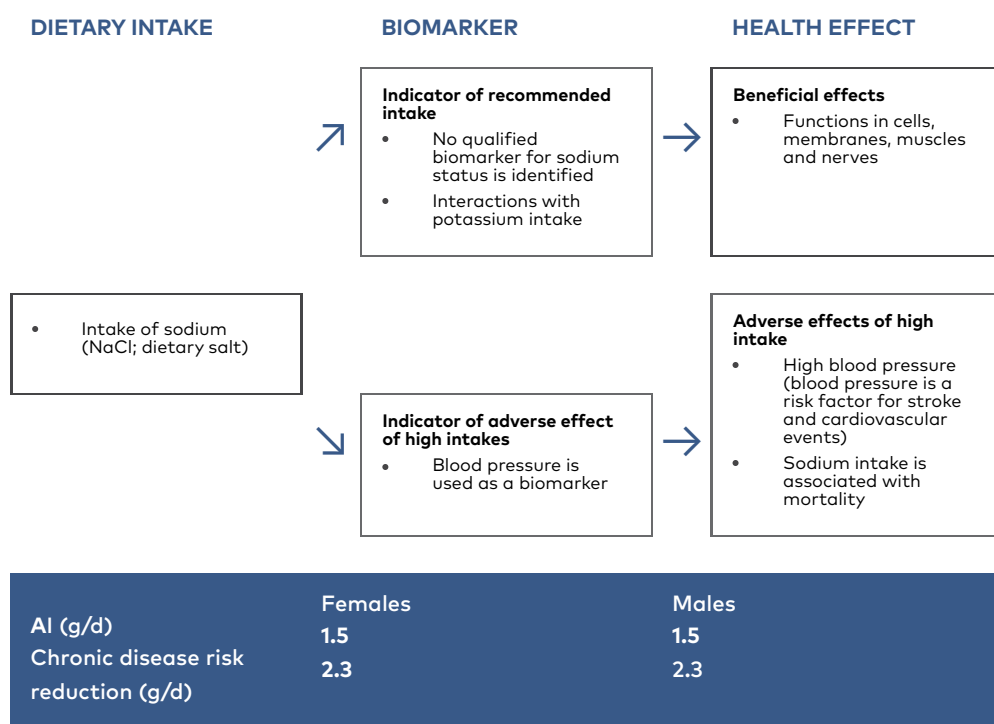


Sodium



For more information about the health effects, please refer to the background paper by Antti Jula (Jula, 2023).

Dietary intake. The main sources of sodium chloride (NaCl) are bread and other bakery products, meat and fish products and ready meals such as pizza, pie and soups, and table salt. Sodium is usually found in very low concentrations in unprocessed foods. One gram of NaCl (salt) corresponds to about 0.4 g sodium, and 1 g sodium is equivalent to 2.54 g salt. Estimates of sodium intakes have been made with different methodologies, and ranges from about 1.8 g/d to 4.4 g/d (Lemming & Pitsi, 2022).

Main functions. The volume of the extracellular fluid and the equilibrium between intracellular and extracellular osmolality is controlled by systems transporting sodium into the cell and by the energy-dependent sodium pump (Na⁺/K⁺-ATPase) that pumps sodium out of the cell in exchange for potassium.

Interaction with other nutrients. Renal sodium excretion is closely related to potassium intake, whereas sodium intake normally does not influence potassium excretion (Toft et al., 2023).

Indicator for recommended intake. There is no sensitive and specific biomarker for estimating sodium status. The impact of sodium on blood pressure is an important indicator of the health impact of sodium as elevated blood pressure is a leading global and Nordic risk factor for premature death and disability (Knudsen et al, 2025).

Main data gaps. A limitation of the current evidence is the lack of a robust biomarker and the limited evidence of health effects of intakes below 1.5 g sodium per day. The currently often used proxy indicator spot urine as a measure of sodium intake instead of the gold standard method, 24-h urinary sodium, is also a limitation (Jula, 2023). Identifying sodium sensitivity among individuals and groups, i.e., the extent that blood pressure responds to changes in sodium intake, is challenging (NASEM, 2019).

Deficiency and risk groups. Sodium deficiency due to low dietary intake is rare. Risk of elevated blood pressure due to high sodium intake increases with ageing. Acute toxicity with fatal outcomes has been reported with single doses ranging from about 7 g, but smaller amounts may be detrimental for subjects with heart failure, renal failure or decompensated liver cirrhosis (Jula, 2023).

Dietary reference values. Sodium balance can be maintained at intakes of about 10 mmol (230 mg) per day in adults, corresponding to about 0.6 g of salt (Jula, 2023). An intake of 25 mmol (575 mg) per day, corresponding to about 1.5 g salt, is set as the estimated lower intake level and accounts for variations in physical activity and climate (SCF, 1993).

Sodium restriction down to a sodium intake level of less than 2 g/d decreases blood pressure linearly by a dose-response manner. Prospective cohort studies indicate that higher sodium intake is associated with an increased risk of stroke and cardiovascular events and mortality among the general adult population. Interventional studies confirm the efficiency and safety of reducing sodium intake to a level of less than 2 g/d (Jula, 2023).

The EFSA Panel considered 2.0 g sodium/day to be a safe and adequate intake for the general EU population of adults (EFSA, 2019b). Also in 2019, the U.S. National Academies of Sciences, Engineering, and Medicine (NASEM) set the reference intake for adults to 1.5 g/d due to limited evidence on health effects of sodium intakes lower than that (NASEM, 2019).

Based on an overall evaluation of the available data in the recent reviews (EFSA, 2019b; NASEM, 2019), the AI in NNR2023 is set to 1.5 g sodium per day (females and males), which corresponds to 3.75 g salt per day.

Reductions in sodium intakes that exceed the chronic disease risk reduction (CDRR) of 2.3 g/d are expected to reduce chronic disease risk within the general population. NNR2023 thus adapts the reasoning from NASEM to recommend limiting intake to 2.3 g/d (about 5.75 g salt).