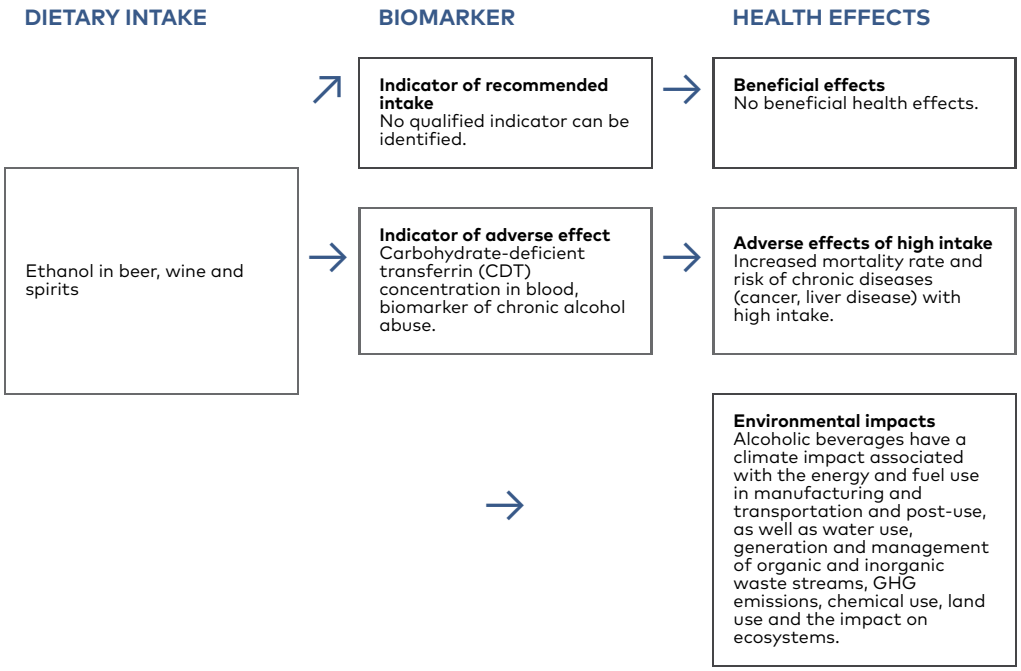
Alcohol



Science advice: No safe lower limit for alcohol consumption has been established. For children, adolescents and pregnant women abstinence from alcohol is advised.

For more information about the health effects, please refer to the background paper by Dag S. Thelle and Morten Grønbæk (Thelle & Grønbæk, 2023).

Dietary intake. Alcohol (ethanol) is generally consumed as beer (about 2.5–6 vol% alcohol), wine (about 12 vol%), or spirits (about 40 vol%). In the Nordic countries and Estonia, the average intake of alcohol varies between 0.7 and 5.3 E%. There are no data on alcohol E% in Latvia or Lithuania (Lemming & Pitsi, 2022).

Main health effects. Alcohol is a toxic substance that affects all organs of the body. The energy from oxidation of alcohol in the body corresponds to 29 kJ (7 kcal) per gram, with a reduced energy efficiency at high alcohol consumption (Thelle & Grønbæk, 2023). Alcohol is efficiently absorbed through passive

diffusion, mainly in the small intestine, and is distributed throughout the total water compartment of the body.

As reviewed in the background paper by Thelle and Grønbæk (2023), both acute and chronic alcohol-induced damage contributes significantly to morbidity and mortality (CCSA, 2023; GBD Alcohol Collaborators, 2018; Mayer-Davis et al., 2020c). Alcohol consumption has been associated with cancer, with convincing evidence for breast cancer and cancer sites in the gastrointestinal tract (WCRF/AICR, 2018h). The older population, e.g., above 50 years of age, has a higher cancer risk associated with alcohol (GBD Alcohol Collaborators, 2018). Chronic high consumption of alcohol may lead to liver cirrhosis and is associated with increased mortality and lower quality of life (CCSA, 2023; GBD Alcohol Collaborators, 2018; Mayer-Davis et al., 2020c; WHO, 2018).

Indicator for recommended intake. Carbohydrate-deficient transferrin (CDT) concentration in blood is a biomarker for chronic alcohol abuse. Blood Alcohol Level (BAL) can be measured and should be zero or close to zero for no alcohol effect in the body (CCSA, 2023; GBD Alcohol Collaborators, 2018; Mayer-Davis et al., 2020c). There is strong evidence linking alcohol consumption to cancer, particularly breast cancer and various cancer locations within the gastrointestinal tract (CCSA, 2023; GBD Alcohol Collaborators, 2018; WCRF/AICR, 2018h; WHO, 2018).

Environmental impacts. Consumption of alcoholic beverages contributes to negative environmental impact just as non-alcoholic beverages (see review and summary on *Beverages* (Sonestedt & Lukic, 2023)). Alcoholic beverages have a climate impact associated with the energy and fuel used in manufacturing, transportation and post-use. Alcoholic beverages generated 3 % of the dietary climate impact in a Swedish study (Hallström et al., 2018; Trolle et al., 2024). The crops used for alcohol production, barley and wheat, may be associated with low biodiversity if produced in large-scale cropping systems with low diversity.

Main data gaps. Studies on methods on how to investigate the amount and pattern of alcohol intake are scarce. There is a lack of data for the evaluation of the quantitative environmental impact of alcoholic beverages.

Risk groups. Excessive alcohol intake increases the risk of low intake and bioavailability of nutrients. Risk groups especially vulnerable for adverse effects of alcohol intake are children, adolescents, pregnant women, and older adults. Occasional intoxication with alcohol, binge drinking, may have detrimental effects, such as violence and traffic accidents. High intake may cause liver disease.

Recommendations

- **Based on health outcomes:** Alcohol is not an essential nutrient, and from a nutritional point of view, energy contribution from high intake of alcoholic beverages affects diet quality negatively. Based on this and new systematic reviews, and since no threshold for safe level of alcohol consumption has currently been established for human health, the NNR2023 recommends avoiding alcohol intake. If alcohol is consumed, the intake should be very low. For children, adolescents and pregnant women abstinence from alcohol is advised.
- **Based on environmental impacts**: The consumption of alcoholic beverages contributes to negative environmental impact.
- **Overall recommendation:** No safe lower limit for alcohol consumption has been established. For children, adolescents and pregnant women abstinence from alcohol is advised.