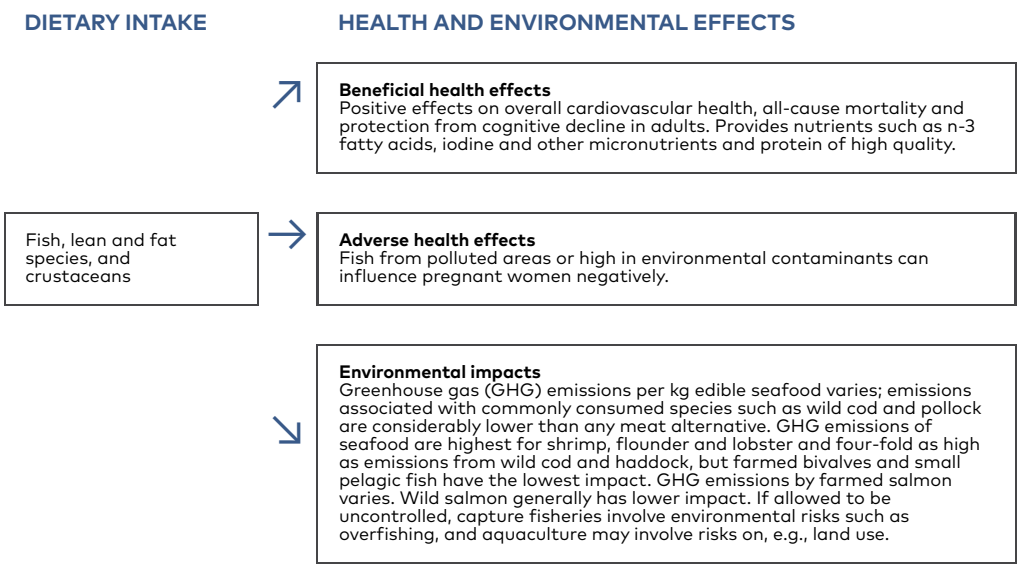
Fish and seafood



Science advice: It is recommended to consume 300-450 g fish/week (ready-to-eat weight), of which at least 200 g/week should be fatty fish. It is recommended to consume fish from sustainably managed fish stocks.

For more information about the health effects, please refer to the background paper by Stine Ulven and Johanna E. Torfadóttir (Ulven & Torfadóttir, 2023). For more information about the environmental impacts, please refer to the following background papers (Benton et al., 2024; Harwatt et al., 2024; Meltzer et al., 2024; Trolle et al., 2024).

Dietary sources and intake. Fish is an important source of nutrients such as n-3 fatty acids, vitamin B_{12} and D, iodine, selenium and protein of high quality.

The average intake of fish and other seafood ranges from approximately 150 to 500 g/week (Lemming & Pitsi, 2022).

Health effects. Four qSRs are available on the role of fish and seafood and health outcomes (Norwegian Scientific Committee for Food and Environment (VKM), 2022; Snetselaar et al., 2020b, c; WCRF/AICR, 2018e). The report from the Norwegian Scientific Committee for Food and Environment (VKM)

demonstrated strong evidence for lower risk of cardiovascular diseases such as coronary heart disease, myocardial infarction and stroke, as well as all-cause mortality (VKM, 2022). In addition, a probable protective association with cognitive decline in adults (e.g., Alzheimer's dementia) and a reduced risk of pre-term birth and low birth weight was found (VKM, 2022). Fish may include contaminants such as dioxins and PCBs that may have harmful effects at high doses (VKM, 2022). Based on a risk-benefit assessment, VKM concludes that the benefits from increasing fish intake to the recommended two to three dinner courses per week (corresponding to 300-450 grams, including at least 200 grams fatty fish in adults) outweigh potential risks for all age groups. Requirements for n-3 fatty acids can be reached by consuming fatty fish and fish oil (VKM, 2022). The reports from the U.S. Dietary Guidelines Advisory Committee demonstrated moderate evidence for a favourable association between intake of seafood during pregnancy and cognitive development in the child (Snetselaar et al., 2020b), while the evidence for a similar relationship with intake during childhood and adolescents was insufficient (Snetselaar et al., 2020c), due to limited available research. The WCRF/AICR (2018e) found only limited evidence for an association between fish and seafoods and certain cancers.

As discussed in the background review by Ulven and Torfadóttir 2023 (Ulven and Torfadóttir 2023), health effects of fish have mainly been associated with their lipid contents, n-3 fatty acids, but fish proteins may also be important. Low intake of n-3 fatty acids is considered a dietary risk, especially in the Baltic countries (Knudsen et al, 2025).

Environmental impacts. Greenhouse gas (GHG) emissions per kg edible seafood varies (IPCC, 2022a). Seafood can have less, but also bigger, footprint on water, land and carbon, than poultry (Gephart et al., 2021). In terms of GHG, the main impact from capture fisheries is fossil fuel use for fishing vessels while the main impact of aquaculture comes from feed production. Overfishing puts strain on fish stocks locally and globally.

A major impact of wild capture fisheries conducted with any kind of net is by-catch. Type and size of by-catch can have large implications for biodiversity (Gephart et al., 2021). Another environmental stressor associated with capture of wild fish is bottom trawling; when used across large areas, bottom trawling can negatively impact biodiversity. Farmed fish and seafood now contribute to 53 % of the total global production, which is expected to increase due to limited growth potential in the capture sector. Aquaculture puts pressure on the environment, due to land use, freshwater use, spread of disease, eutrophication and chemical pollution (Harwatt et al., 2024; Meltzer

et al., 2024; Trolle et al., 2024). To efficiently use fish without necessary waste, the inclusion of processed fish products is justified from an environmental perspective.

Main data gaps. More data is needed about health-promoting constituents and health effects of fish. A comprehensive assessment of sustainable fish and seafood yields in the Nordic and Baltic countries is needed. For reliable assessment of biodiversity impact more data on by-catch and on physical damage to ecosystems via trawling methods are required.

Risk groups. People with allergies to fish and other seafood. Pregnant and lactating women are advised to avoid certain fish that may be polluted by environmental toxins. Large fresh-water fish from certain areas may contain methyl mercury, and fish from the Baltic Sea or fjords may contain pollutants. Lean fish generally contain lower levels of persistent organic pollutants (POPs). Low- or non-consumers have an increased risk of iodine, vitamin B_{12} and vitamin D inadequacy.

Science advice:

- **Based on health outcomes:** It is recommended to consume 300-450 g fish/week (cooked or ready-to-eat weight). At least 200 g/week should be fatty fish, due to the content of long-chain n-3 fatty acids. Limit intake of fish from polluted areas or high in environmental contaminants, especially during pregnancy and lactation.
- **Based on environmental impacts:** Fish and seafood from sustainably managed farms and wild stocks should be prioritized and consumption of species with high environmental impact should be limited.
- **Overall science advice:** It is recommended to consume 300-450 g fish/week (cooked or ready-to-eat weight), of which at least 200 g/week should be fatty fish. It is recommended to consume fish from sustainably managed fish stocks.