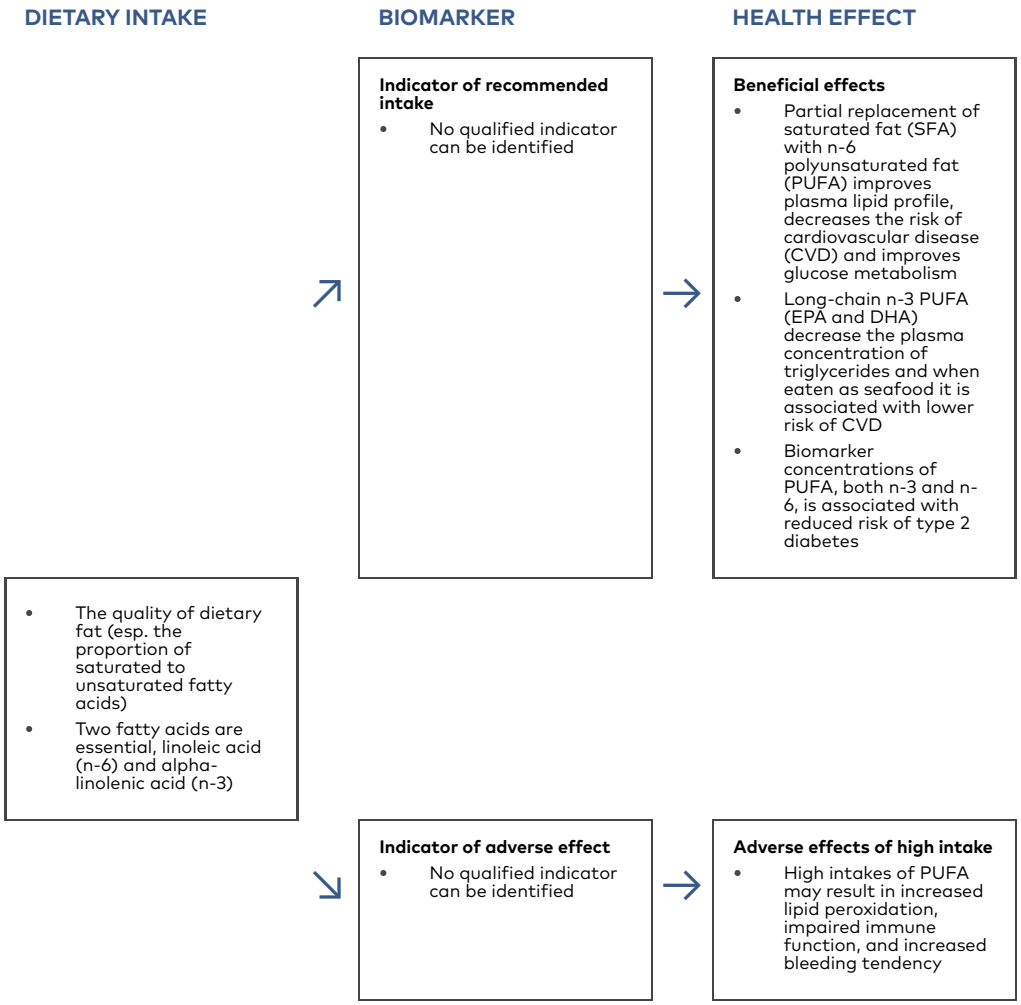
Fat and fatty acids



Total fat	25-40 E%
Saturated fat	<10 E%
Monounsaturated fat	10-20 E%
Polyunsaturated fat	5-10 E%
of which LA+ALA/n3/ALA at least	3/1/0.5 E%
Trans fat	As low as possible

For more information about the health effects, please refer to the background paper by Kjetil Retterstøl and Fredrik Rosqvist (Retterstøl & Rosqvist, 2023).

Dietary sources and intake. The main sources of fat are oils and dietary fats, nuts, seeds, but also dairy and meat products, snacks, and confectionary. In the Nordic countries and Estonia, the average intake of fat varies between 34 and 39 E%. In Latvia and Lithuania, the intake is above 40 E%, because of different calculation procedures. The average intake of saturated fat in all countries is above the recommendation (Lemming & Pitsi, 2022).

Main functions. Fat is needed as a source of energy and essential fatty acids, and for the absorption of fat-soluble vitamins. A diet lower in total fat is associated with reductions in body weight compared to a diet higher in total fat in adults (Hooper et al., 2020b). Partial replacement of saturated fat (SFA) with n-6 polyunsaturated fat (PUFA), mainly linoleic acid, or whole grains/high-fibre carbohydrate-containing foods, improves blood lipid profiles, decreases the risk of coronary heart disease, and improves glucose-insulin homeostasis (Hooper et al., 2020a; Reynolds et al., 2022; Schwab et al., 2014; Snetselaar et al., 2020a; Wolfram et al., 2015). Intake of long-chain n-3 PUFA (EPA and DHA) decreases concentrations of triglycerides and is associated with lower risk of cardiovascular disease (Snetselaar et al., 2020a). Higher biomarker concentrations of PUFA intake, both n-3 and n-6 PUFA, are associated with lower risk of type 2 diabetes (Retterstøl & Rosqvist, 2023).

Interaction with other nutrients. Diets with total fat intake lower than recommended may compromise the intake and absorption of fat-soluble vitamins.

Indicator for recommended intake. There is no specific biological marker for recommended fat intake.

Main data gaps. There is a lack of studies on the associations between ruminant trans fatty acids and odd-chain fatty acids and risk of type 2 diabetes and cardiovascular disease. The potential impact of different types of dietary fats on musculoskeletal and mental health also warrants more investigation. A *de novo* NNR2023 qSR found that the evidence was limited and inconclusive regarding health effects of types of fatty acids and adverse cognitive outcomes, due to a lack of data (Nwaru et al., 2022). Another *de novo* NNR2023 qSR also found limited evidence for effects of supplementation of long-chain n-3 fatty acids during pregnancy, lactation or infancy on risk of asthma/wheeze, eczema/atopic dermatitis or allergy (Bärebring et al., 2022). More conclusive evidence for potential food source-specific effects of SFA is needed for FBDG.

Deficiency and risk groups. Diagnosed deficiency of the essential fatty acids linoleic acid (LA) and alpha-linolenic acid (ALA) in adults is rare. Reported cases have been associated with chronic gastrointestinal diseases or prolonged parenteral or enteral nutrition either without fat or very low in fat. Clinical symptoms of deficiency (skin changes, neurological symptoms and growth retardation) have been found in healthy new-born babies fed for 2 to 3 months with a diet low (<1 E%) in LA.

Recommendations. An extensive discussion on the recommendations for fats and fatty acids is described in the NNR2023 background review (Retterstøl & Rosqvist, 2023; Rosqvist & Niinistö, 2023). The recommendations from NNR2012 are kept unchanged. Recommendations for fat are set based on health effects, the need for essential fatty acids and the requirement of fat-soluble vitamins. Minimum requirements of PUFA for adults are not known and the estimates are based on threshold intake data from children. There is not enough available scientific evidence for setting a recommendation for the ratio of n-6 to n-3 PUFA.

Intake of SFA should be less than 10 E% in the general population. The intake of trans fats should be as low as possible and will be ensured by complying with total SFA intake below 10 E%. MUFA should contribute between 10–20 E% in the diet. The intake of n-6 and n-3 PUFA in total should give 5–10 E%, of which n-3 fatty acids should account for at least 1 E%. MUFA and PUFA should make up at least two thirds of the total fatty acids. The recommendation for essential fatty acids is 3 E%, of which at least 0.5 E% should be ALA.