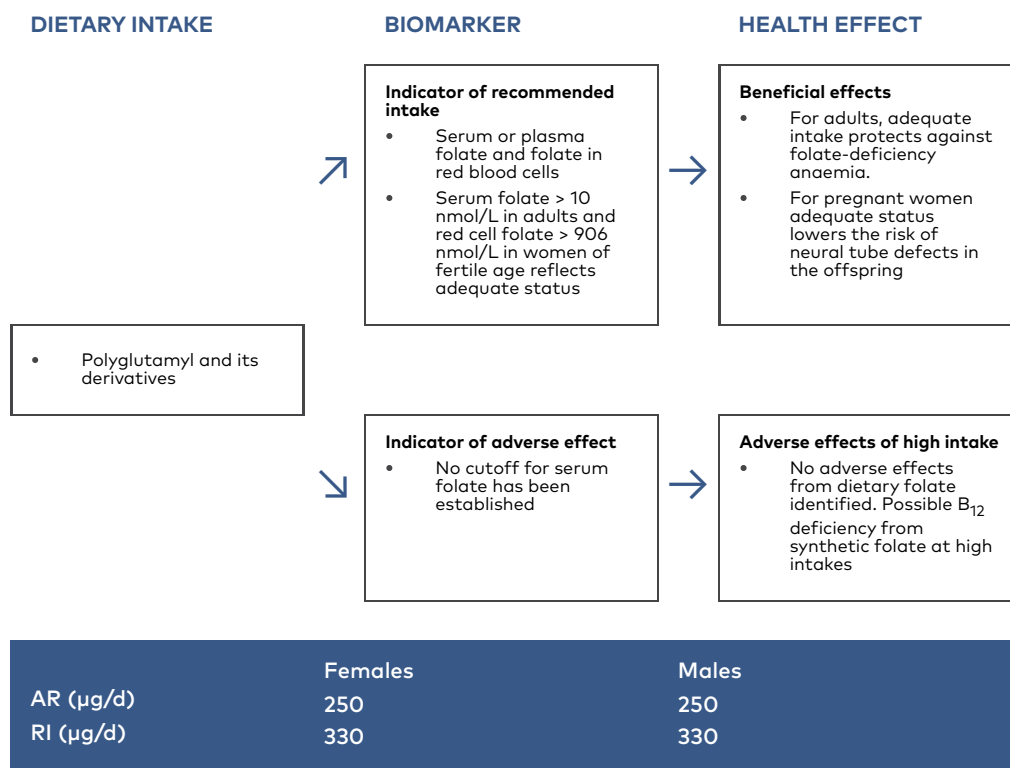


## Folate (vitamin B<sub>9</sub>)



For more information about the health effects, please refer to the background paper by Anne-Lise Bjørke Monsen and Per Magne Ueland (Bjørke-Monsen & Ueland, 2023a).

**Dietary sources and intake.** Folate is present in most foods, with main sources in Nordic and Baltic diets being green vegetables and whole grain products. Highest folate concentrations are found in liver and legumes. Dietary folate is sensitive to light and oxidation and is partly degraded by cooking. Synthetic folic acid is mainly found in supplements. Mean daily intakes of folate in the Nordic and Baltic countries vary from 164 µg in women in Estonia to 370 µg in men in Denmark. The average folate intake ranges from 164 to 383 µg/d (Lemming & Pitsi, 2022).

**Main functions.** Folate is an essential micronutrient for normal development and metabolic function as a cofactor for enzymes in one-carbon metabolism, thus important for the biosynthesis of nucleotides (RNA and DNA) (Bjørke-Monsen & Ueland, 2023a). Foliates are also necessary for the conversion of homocysteine to methionine (Bjørke-Monsen & Ueland, 2023a; EFSA, 2014f). Supplemental folic acid (in addition to dietary folate intake) before pregnancy prevents neural tube defects (spina bifida and anencephaly) in infants (Bjørke-Monsen & Ueland, 2023a).

**Indicator for recommended intake.** Serum or plasma folate and folate in red blood cells are the primary biomarkers of dietary intake.

**Main data gaps.** Lack of biomarker cut-offs for adverse health effects.

**Deficiency and risk groups.** Deficiency is manifested mainly as megaloblastic anaemia. People with low folate intake, malabsorption or increased folate requirements have a risk of developing folate deficiency. Individuals who are homozygous for the C677C→T-polymorphism (TT genotype) in the methylene tetrahydrofolate reductase (MTHFR) gene have increased requirements (Bjørke-Monsen & Ueland, 2023a). Alcohol use disorder is associated with severe folate deficiency linked to poor dietary intake, intestinal malabsorption, impaired hepatic uptake with reduced storage of folates, and increased renal excretion. Children and pregnant and lactating females also have an increased demand for folate and may be at risk of inadequate intake.

**Dietary reference values.** The AR for adults was derived from the level of intake required to maintain serum and red blood cell folate concentrations of  $\geq 10$  and 340 nmol/L, respectively. AR is set to 250  $\mu\text{g}/\text{day}$  in females and males. RI is set to 330  $\mu\text{g}/\text{day}$  (females and males). No AR is set for pregnant females due to insufficient evidence. Instead, an AI is set to 600  $\mu\text{g}/\text{day}$  for pregnant females, and a provisional AR is set to 480  $\mu\text{g}/\text{day}$ , derived from the AI set by EFSA (EFSA, 2014f), which is based on a controlled metabolic study in pregnant females (Caudill et al., 1997). In most Nordic and Baltic countries, females of reproductive age are recommended to take a supplement of 400  $\mu\text{g}/\text{day}$  from planned pregnancy and throughout the first trimester of pregnancy. The UL of folic acid (synthetic) is 1000  $\mu\text{g}/\text{d}$ .