

Ravintoaineet suosituksessa

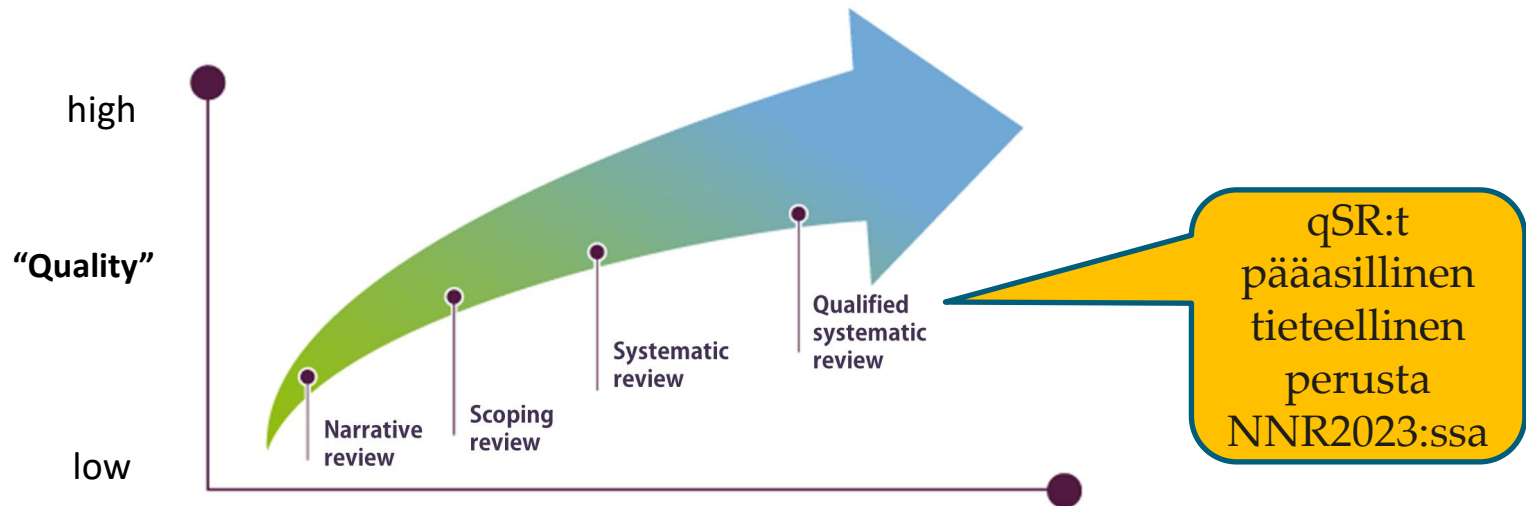
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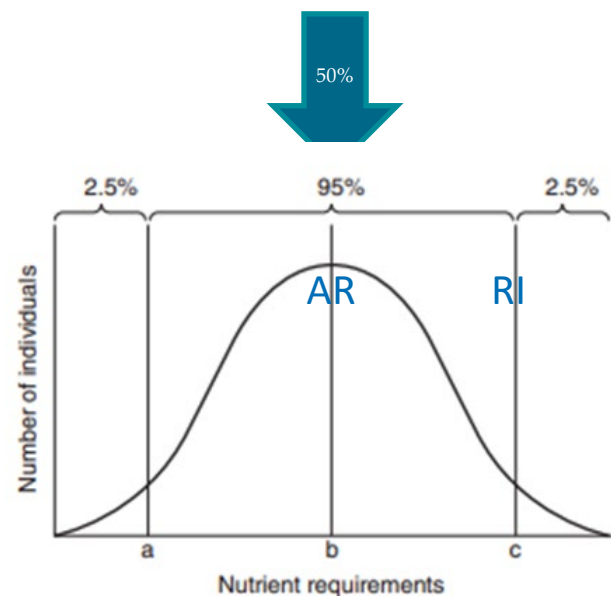
Ravinto- ja ruoka-ainesuositusten tausta



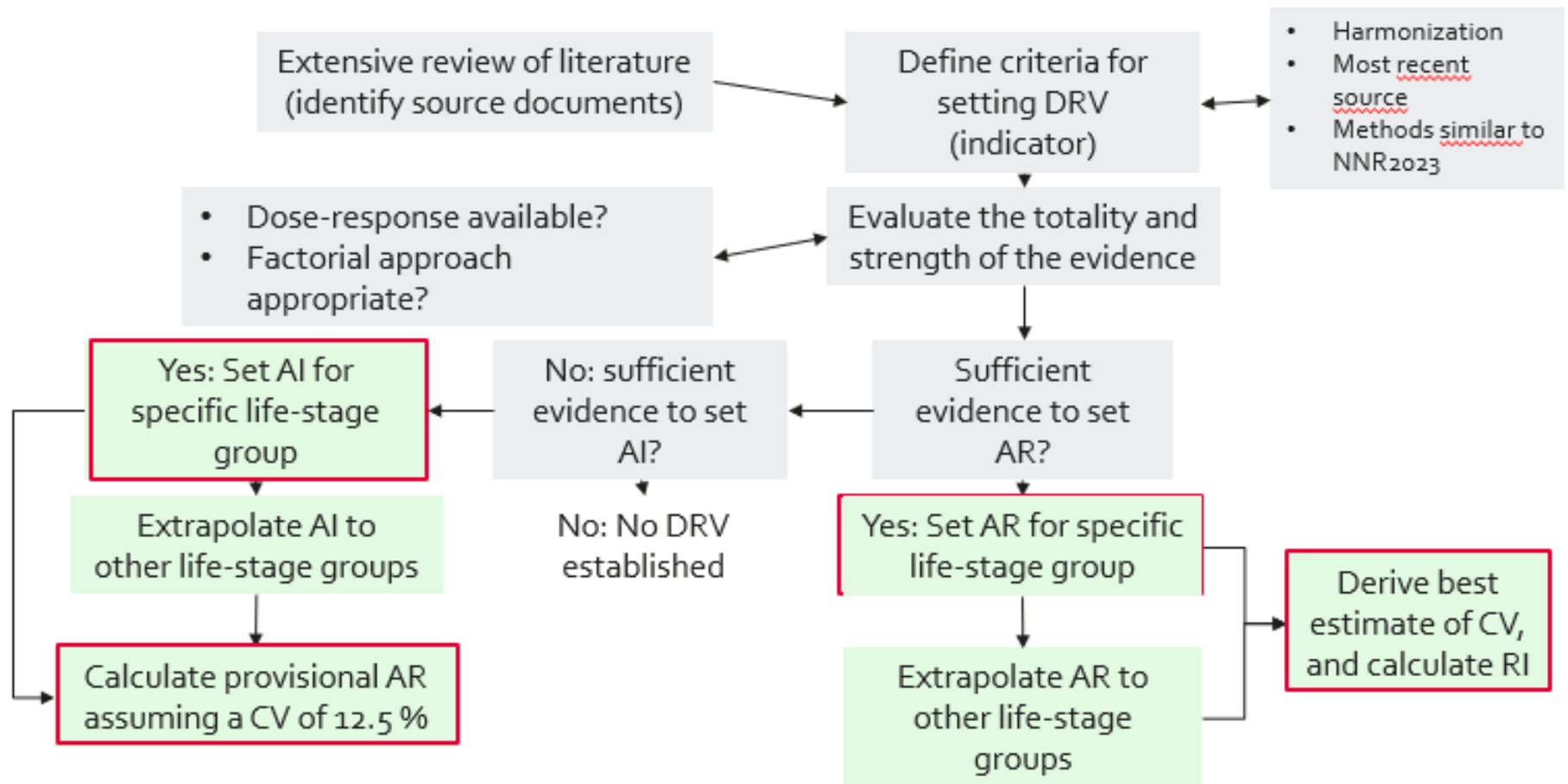
- Noin 100 SR identifioitiin qSR:ksi
- 9 de novo qSR:a

Suosituksset (dietary reference values (DRVs))

- Ravinnonsaannin suunnitteluun ja arviointiin **ryhmätasolla**
 - Referenssiarvot energialle
 - Suositeltava vaihteluväli energiaravintoaineille
 - Referenssiarvot mikroravintoaineille
 - AR
 - RI
 - AI
 - Ehdollinen AR
 - CDRR



DRV:n asettaminen



Energiaravintoaineet

Box 2: Recommended intake ranges of macronutrients for adults

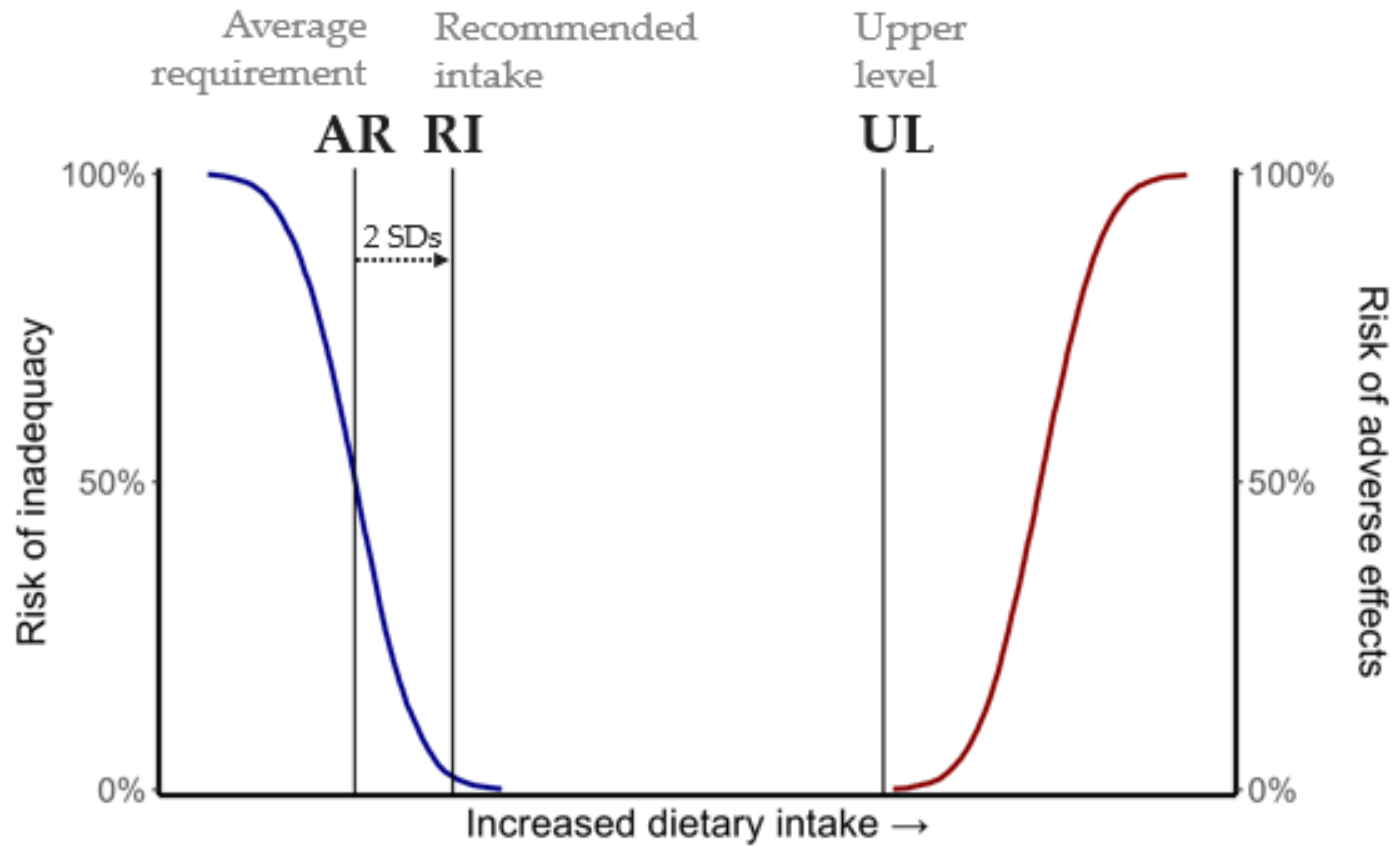
Fats		25-40 E%
Cis-monounsaturated		10-20 E%
Cis-polyunsaturated		5-10 E%
Saturated fatty acids		<10 E%
Carbohydrates		45-60 E%
Dietary fibre		≥25-35 g/d
Added and free sugars		<10 E%
Proteins		10-20 E%

Kuitu ≥ 3 g/MJ

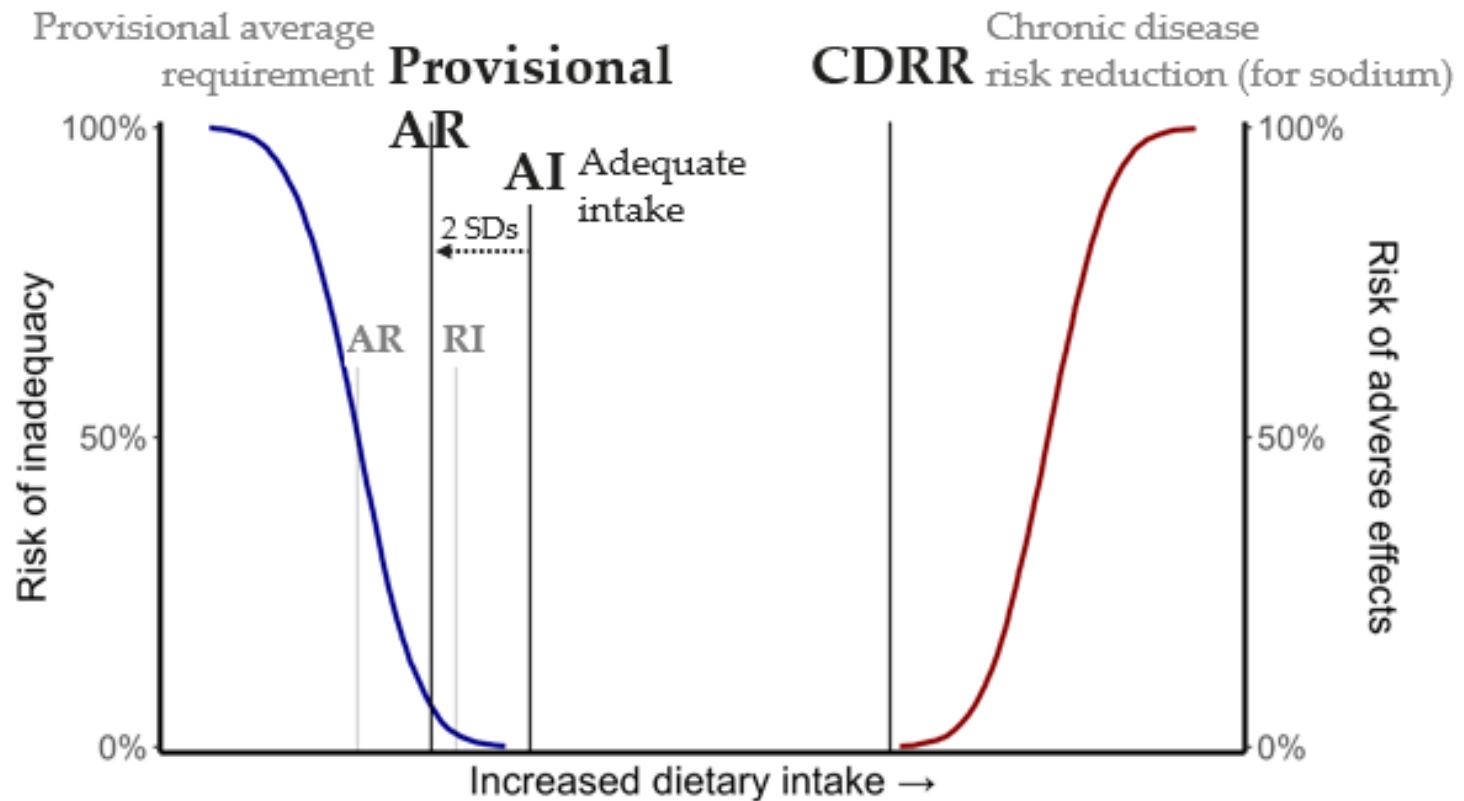
Proteiini

- AR 0.66 g/kg
- RI 0.83 g/kg
- \geq 65-vuotiaat
 - 15-20 E%
- Välttämättömien aminohappojen riittävä saanti
 - Eläinkunnan proteiinin lähteet
 - Monipuolinen kasviproteiinin lähteiden käyttö
 - Palkokasvit
 - Viljatuotteet

AR, RI, UL



Kolme uutta DRV:a - AI, ehdollinen AR ja CDRR



DRV 34:lle ravintoaineelle

- **Kaikki DRV:t laskettu uudelleen**
- 7 ravintoaineelle DRV ensimmäistä kertaa
 - K-vitamiini, biotiini, pantoteenihappo
 - koliini
 - mangaani, molybdeeni, fluori
- 9 ravintoaineen DRV muuttui >20%
 - E-vitamiini, B₆-vitamiini, folaatti, B₁₂-vitamiini, C-vitamiini,
 - tiamiini
 - kalsium, sinkki, seleeni

Major reasons for changes in DRVs from NNR2012 to NNR2023

For most nutrients, there are only minor changes, despite the comprehensive recalculations in NNR2023. The changes can be attributed to updated methodology, the new reference weights and the new age groups used in NNR2023 (see nutrient summaries, appendices and background papers). For nine nutrients, one or more DRVs changed more than 20 % compared to the NNR2012 values. The main reasons are listed below.

Vitamin E. While NNR2012 defined a RI for vitamin E, NNR2023 define an AI. The AI is based on a basal vitamin E requirement (4 mg) plus a factor based on the dietary intake of 5 E% PUFA. The provisional AR is calculated from the AI.

Vitamin B₆. A new cut-off value for the indicator (plasma PLP concentration 30 nmol/l) is used to define AR, in line with EFSA. It is not based on protein intake as in NNR2012. Due to less data for males, the female AR is extrapolated to males with allometric scaling. RI is calculated from AR.

Miksi suositus muuttui?

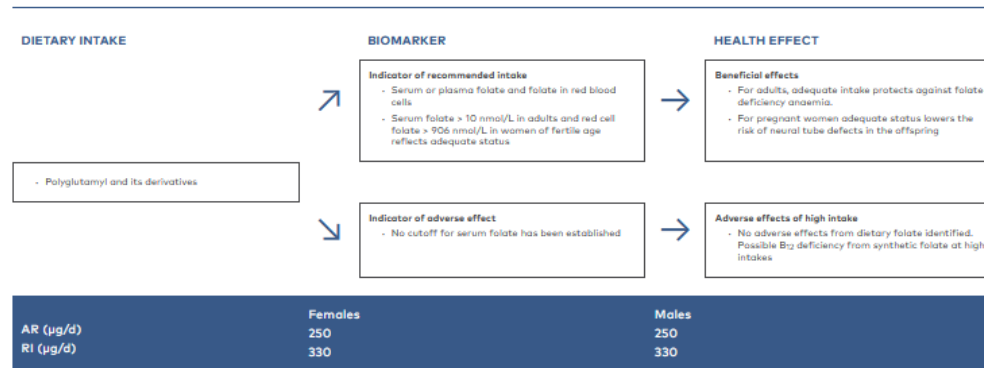
- RI -> AI
 - E-vitamiini, B12-vitamiini, seleeni
- B6-vitamiini
 - Uusi indikaattori: plasman PLP-pitoisuus (aiemmin proteiinin saanti)
- Folaatti
 - Uusi cut off –arvo aiemmin käytetylle indikaattorille (plasman ja punasolujen folaatti)
- C-vitamiini
 - Uusi cut off –arvo aiemmin käytetylle indikaattorille (plasman askorbaattipitoisuus 50 vs. 32 umol/l)
- **Tiamiini**
 - Edelleen 0.1 mg/MJ, uudet painotiedot ja ikäkattegoriat
- Sinkki
 - Suurempi arvioitu fytaatin saanti -> vähentynyt imeytyminen
- Kalsium
 - Aiempaa laajempi tutkimusnäyttö, sisältäen kalsiumin hävikin ihon kautta

Table 22 Comparison between RI and AI set by NNR2023 (25-50 years) and NNR2012 (31-60 years). *AI is shown in italics*

	NNR2023		NNR2012		Comments
	RI		RI		
	FEMALES	MALES	FEMALES	MALES	
Vitamin A, RE	700	800	700	900	
Vitamin D, µg	10	10	10	10	
Vitamin E, α-TE	10	11	8	10	AI in NNR2023
Vitamin K, µg	65	75	ND	ND	AI in NNR2023
Thiamin, mg	0.9	1.1	1.1	1.3	

Riboflavin, mg	1.6	1.6	1.3	1.6	
Niacin, NE	14	18	14	18	
Vitamin B ₆ , mg	1.6	1.8	1.2	1.5	
Folate, µg	330	330	300	300	
Vitamin B ₁₂ , µg	4	4	2	2	AI in NNR2023
Biotin, µg	40	40	ND	ND	AI in NNR2023
Pantothenic acid, mg	5	5	ND	ND	AI in NNR2023
Choline, mg	400	400	ND	ND	AI in NNR2023
Vitamin C, mg	95	110	75	75	
Calcium, mg	950	950	800	800	
Phosphorus, mg	520	520	600	600	AI in NNR2023
Magnesium, mg	300	350	280	350	AI in NNR2023
Sodium, g	1.5	1.5	ND	ND	AI in NNR2023
Potassium, g	3.5	3.5	3.1	3.4	AI in NNR2023
Iron, mg	15	9	15	9	
Zinc, mg	9.7	12.7	7	9	
Iodine, µg	150	150	150	150	AI in NNR2023
Selenium, µg	75	90	50	60	AI in NNR2023
Copper, µg	900	900	900	900	
Manganese, mg	3	3	ND	ND	AI in NNR2023
Molybdenum, µg	65	65	ND	ND	AI in NNR2023
Fluoride, µg	3.2	3.7	ND	ND	AI in NNR2023

Folate (vitamin B₉)



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 ≥10 and 340 nmol/L, respectively. AR is set to 250 µg/day in females and males. RI is set to 330 µg/day (females and males). No AR is set for pregnant females due to insufficient evidence. Instead, an AI is set to 600 µg/day for pregnant females, and a provisional AR is set to 480 µg/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 µg/day from planned pregnancy and throughout the first trimester of pregnancy. The UL of folic acid (synthetic) is 1000 µg/d.

CONTENTS

Please, click the three lines in the right top corner for full menu and more details of contents. Or click the arrow in blue box to the right for direct access to the following pages.

▸ [DOWNLOAD PDF OF THE FULL REPORT](#)

Secretary General's Preface

▸ [Shortcut for Preface](#)

Introduction

▸ [Shortcut for Introduction](#)

Recommendations

▸ [Shortcut for Recommendations](#)

Nutrients

▸ [Shortcut for Overview of
Nutrients](#)

Food groups, meal and dietary patterns

▸ [Shortcut for Overview of
food groups, meal and dietary
patterns](#)

Appendix

▸ [Shortcut for Appendix](#)