

An evaluation of dietary reference values for vitamins and minerals for lactating women

No. 2024/16Ae, The Hague, December 3, 2024

Background document to:

Dietary reference values for vitamins and minerals for lactating women

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1 Introduction

This background document provides background information on how the committee has established the dietary reference values for lactating women. It explains how the European Food Safety Authority (EFSA) derived its dietary reference values and the extent to which the committee can support them for the Dutch situation.

Where appropriate, this background document includes other international reports, such as the dietary reference values of the Nordic countries (Nordic Council of Ministers, NCM) and the US Institute of Medicine (IOM, which is now known as the Health and Medical Division of the National Academies).

The committee has chosen the term 'lactating woman' for readability, but acknowledges that the words 'woman' or 'mother' do not reflect the experiences and identities of all individuals in the target group. Where the committee uses the term 'non-lactating woman', this refers to women of childbearing age who are not breastfeeding and who are not pregnant.

The derivation method used for the dietary reference values for lactating women varies between nutrients. An additive model is usually used, whereby an additional requirement for the lactation period (to support breastfeeding) is added to the dietary reference value for non-lactating women. The additive model is used because there is typically a lack of research on the total requirements for lactating women.

The additional requirement is often based on the (average) amount of a specific nutrient in breast milk during a period of exclusive breastfeeding for the first six months after delivery. This (average) additional requirement is added to the average requirement for non-lactating women and then multiplied by a coefficient of variation to arrive at a population reference intake for lactating women. In the case of nutrients that have an adequate intake as their dietary reference value, an additional requirement is added to the adequate intake. In some cases, the dietary reference value for non-lactating women is applied to lactating women. This is the case when there is insufficient substantiation that a lactating woman requires a higher intake of that particular nutrient.

In cases where dietary reference values were evaluated in the adult context as 'do not merit to being applied', the EFSA's dietary reference values were accepted for both adults and pregnant women. These cases include pantothenic acid (vitamin B5), biotin, vitamin E, choline, phosphorus, manganese and molybdenum. These dietary reference values are weakly substantiated and are mostly based on average intakes combined with the fact that there are no known deficiencies (making the dietary reference values of little relevance to the general population). The committee only evaluated whether there were any known deficiencies of these nutrients in breastfeeding women.

Where no deficiencies had been reported in breastfeeding women either, the committee adopted the EFSA's dietary reference value for lactating women without further evaluation.

For context to the recommendation, the currently applicable Dutch dietary value for lactating women is provided for each nutrient and, where differences arise, the EFSA's dietary reference value for this group as well as the dietary reference value prescribed by NCM 2023.¹ The current Dutch dietary reference values for adults (women) and breastfeeding women are also presented.^{2,3}

2 Vitamin A (retinol and carotene)

2.1 Overview of the Dutch dietary reference values for vitamin A

Table 1 Summary table of the dietary reference values for vitamin A

	Lactating women	Pregnant women ³	Non-pregnant and non-lactating women ³	Dietary reference value for lactating women to date ⁴
Average requirement	-	580 µg RAE/d	530 µg RAE/d	-
Population reference intake	-	750 µg RAE/d	690 µg RAE/d	-
Adequate intake	1,100 µg RAE/d	-	-	1,100 µg RAE/d

RAE: retinol activity equivalents

2.2 Explanation

According to the EFSA,⁵ the amount of retinol in breast milk varies widely (229-831 µg/l). The EFSA used the middle of the range as the basis for the concentration used for calculation: 530 µg/l. Taking into account a volume of 800 ml of breast milk per day, the EFSA arrived at an average secretion of 424 µg/day of retinol in breast milk (Section 2.3.6.3 of the EFSA report). The additional requirement during the lactation period was then calculated by dividing the amount in breast milk by an 80% absorption efficiency. This led to an additional requirement of 530 µg RE/d, in addition to the average requirement for adult women. To calculate the population reference intake, a coefficient of variation of 15% was used.

The EFSA's calculation is based on the premise of maintaining the liver's reserve of vitamin A.

The EFSA established the vitamin A dietary reference values using the unit 'retinol equivalent'. The Health Council of the Netherlands has chosen the unit 'retinol activity equivalent' (RAE) for the Netherlands.^{2,3} Therefore, the dietary reference value for lactating women should also be expressed in RAE. Although this has no bearing on the method for setting the dietary reference value, it does affect its implementation.

The committee disagrees with the premise that the dietary reference value should be based on *maintaining* the liver's reserve of vitamin A. The ample body reserves of a well-nourished mother are sufficient to meet the period of increased vitamin A needs during lactation. Even a marginally nourished mother still has liver reserves of vitamin A of several months.⁶ The committee therefore does not agree with an increase based on the EFSA's derivation method and maintains the current adequate intake of vitamin A for lactating women in the Netherlands.

The current Dutch dietary reference value for lactating women, based on NCM 2014⁴, calculates an additional requirement of 400 µg RAE/d to be added to the population reference intake. This gives an adequate intake of 1,100 µg RAE. NCM 2014 used the following calculation: an additional RAE of 400 µg per day assuming an amount of 350-450 µg RAE per day and a volume of 750 ml of breast milk per day. No absorption factor was indicated.

Table 2 Summary table of the dietary reference values for vitamin A of the Netherlands, the EFSA and the NCM for lactating women

	Health Council of the Netherlands	EFSA ⁵	NCM 2023 ¹
Average requirement	-	1,020 µg RE/d ^a	1,060 µg RE/d
Population reference intake	-	1,300 µg RE/d	1,400 µg RE/d
Adequate intake	1,100 µg RAE/d	-	-

RAE: retinol activity equivalent, RE: retinol equivalent

^aEFSA⁵ (and NCM 2023¹): RE (1 µg retinol, 2 µg supplemental β-carotene, 6 µg dietary β-carotene, 12 µg other dietary carotenoids); Health Council of the Netherlands 2018/2021^{2,3} (and NCM 2014⁴): RAE (1 µg retinol, 2 µg supplemental β-carotene, 12 µg dietary β-carotene, 24 µg other dietary carotenoids).

3 Thiamin (vitamin B1)

3.2 Overview of the Dutch dietary reference values for vitamin B1

Table 3 Summary table of the dietary reference values for vitamin B1

	Lactating women	Pregnant women ³	Non-pregnant and non-lactating women ²	Dietary reference value for lactating women to date ⁷
Average requirement	0.072 mg/MJ (+0.11 mg/d ^a)	0.072 mg/MJ	0.072 mg/MJ	1.2 mg/d
Population reference intake	0.1 mg/MJ (+0.16 mg/d ^b)	0.1 mg/MJ Trimesters: First: 0.9 mg/d Second: 1.0 mg/d Third: 1.1 mg/d	0.1 mg/MJ	1.7 mg/d
Adequate intake	-	-	-	-

^a Calculated on the basis of the additional energy requirement for lactating women

^b Calculated on the basis of the additional energy requirement for lactating women *2*coefficient of variation (20%)

3.3 Explanation

The committee adopts the EFSA's dietary reference value for lactating women, as it has done for pregnant women and non-pregnant, non-lactating women. The EFSA's dietary reference values are expressed in mg/MJ⁸ and are therefore conditional on energy intake. The committee notes that, when calculating the required daily amount in milligrams, the established additional energy requirement for Dutch lactating women³ should be used (specifically, an additional energy requirement of 1.6 MJ/d instead of the 2.1 MJ/d used by the EFSA).

4 Riboflavin (vitamin B2)

4.1 Overview of the Dutch dietary reference values for vitamin B2

Table 4 Summary table of the dietary reference values for vitamin B2

	Lactating women	Pregnant women ³	Non-pregnant and non-lactating women ²	Dietary reference value for lactating women to date ⁷
Average requirement	1.7 mg/d	1.5 mg/d	1.3 mg/d	1.2 mg/d
Population reference intake	2.0 mg/d	1.9 mg/d	1.6 mg/d	1.7 mg/d
Adequate intake	-	-	-	-

4.2 Explanation

The committee adopts the EFSA's dietary reference value for lactating women⁹, as it has done for pregnant women³, and non-pregnant, non-lactating women.²

The EFSA⁹ based the additional requirement of riboflavin during lactation on the concentration of riboflavin in breast milk. It assumed 800 ml of milk per day in the first six months of breastfeeding and a concentration of 364 µg/l of riboflavin. In this case, the secretion of riboflavin in breast milk amounts to 291 µg/day (Section 2.3.6.3 of the EFSA report).

Section 6.5 of the EFSA report gives the following calculation:

Average requirement for lactating women = 1.34 mg/day [= the unrounded average requirement for non-lactating women] + (0.291 mg/d [= secretion in breast milk] / 0.95 [95% absorption efficiency]) = 1.65 mg/d. The following data were used to calculate the population reference intake: an average requirement of 1.65 mg/d, a coefficient of variation of 10% (as for other adults), and rounding to one decimal place.

5 Niacin (vitamin B3)

5.1 Overview of the Dutch dietary reference values for vitamin B3

Table 5 Summary table of the dietary reference values for vitamin B3

	Lactating women	Pregnant women ³	Non-pregnant and non-lactating women ²	Dietary reference value for lactating women to date ⁷
Average requirement	1.3 mg NE/MJ (+2.0 mg NE/d)	1.3 mg NE/MJ	1.3 mg NE/MJ	14 mg NE/d
Population reference intake	1.6 mg NE/MJ (+2.4 mg NE/d)	1.6 mg NE/MJ Trimesters: First: 15 mg NE/d Second: 16 mg NE/d Third: 17 mg NE/d	1.6 mg NE/MJ	20 mg NE/d
Adequate intake	-	-	-	-

^a Calculated on the basis of the additional energy requirement for lactating women

^b Calculated on the basis of the additional energy requirement for lactating women *2*coefficient of variation (10%)

5.2 Explanation

The committee adopts the EFSA's dietary reference value for lactating women (average requirement = 1.3 mg NE/MJ and population reference intake = 1.6 mg NE/MJ)¹⁰, as it has done for pregnant women³ and non-pregnant or lactating women.² The EFSA's dietary reference value is expressed in mg/MJ⁸ and is therefore conditional on energy intake. The extent to which this is conditional does not differ for pregnant or lactating women compared to non-pregnant and non-lactating women. The committee notes that, when calculating the required daily amount in milligrams, the established additional energy requirement for Dutch lactating women³ should be used (specifically, an additional energy requirement of 1.6 MJ/d instead of the 2.1 MJ/d used by the EFSA).

6 Pantothenic acid (vitamin B5)

6.1 Overview of the Dutch dietary reference values for vitamin B5

Table 6 Summary table of the dietary reference values for vitamin B5

	Lactating women	Pregnant women ³	Non-pregnant and non-lactating women ²	Dietary reference value for lactating women to date ⁷
Average requirement	-	-	-	-
Population reference intake	-	-	-	-
Adequate intake	7 mg/d	5 mg/d	5 mg/d	7 mg/d

6.2 Explanation

The committee adopts the EFSA's dietary reference value for lactating women¹¹, as it has done for pregnant women³ and non-pregnant, non-lactating women.²

For non-pregnant and non-lactating women as well as pregnant women, the Health Council of the Netherlands has concluded that the dietary reference values for pantothenic acid are weakly substantiated and therefore do not need to be applied for public education on nutrition or for monitoring the nutrient intake across the population. In Section 2.2 of its report on pantothenic acid¹¹, the EFSA addresses data regarding deficiencies. There is no information in these requirements that specifically pertains to lactating women. The committee therefore has no reason to believe that the dietary reference value for pantothenic acid 'merits to be applied' to specifically lactating women.

7 Vitamin B6

7.1 Overview of the Dutch dietary reference values for vitamin B6

Table 7 Summary table of the dietary reference values for vitamin B6

	Lactating women	Pregnant women ³	Non-pregnant and non-lactating women ²	Dietary reference values for lactating women to date ¹²
Average requirement	1.2 mg/d	1.3 mg/d	1.1 mg/d	1.35 mg/d
Population reference intake	1.7 mg/d	1.8 mg/d	1.5 mg/d	1.9 mg/d
Adequate intake	-	-	-	-

7.2 Explanation

The committee adopts the EFSA's additional requirement for lactating women¹³ and adds it to the 2003 average requirement for non-pregnant or lactating women.¹² In 2018, the Netherlands did not adopt the EFSA's dietary reference values for this group.²

The EFSA's additional requirement of 0.133 mg/d is based on secretion in breast milk (concentration 0.125 mg/l; volume of 800 ml of breast milk per day; bioavailability of 75%). This 0.133 is added to the Health Council of the Netherlands' 2003 average requirement for adult women (1.1 mg/d).¹² This puts the average requirement for lactating women at 1.2 mg/d. Based on a coefficient of variation of 20%, this leads to the population reference intake of 1.7 mg/d. The EFSA used a coefficient of variation of 10% to calculate the average requirement for the population reference intake. However, because the EFSA's dietary reference value for adults had not been adopted in the Netherlands, and the Dutch population reference intake for adult women is based on a coefficient of variation of 20%, this percentage was also applied to pregnant and lactating women.

The Dutch population reference intake of B6 for lactating women is therefore numerically similar with that of the EFSA. This does not apply to the average requirement.

Table 8 Summary table of the dietary reference values for vitamin B6 of the Netherlands, the EFSA and the NCM for lactating women

	Health Council of the Netherlands	EFSA ¹³	NCM 2023 ¹
Average requirement	1.2 mg/d	1.4 mg/d	1.4 mg/d
Population reference intake	1.7 mg/d	1.7 mg/d	1.7 mg/d
Adequate intake	-	-	-

8 Folate

8.1 Overview of the Dutch dietary reference values for folate

Table 9 Summary table of the Dutch dietary reference values for folate

	Lactating women	Pregnant women ³	Non-pregnant and non-lactating women ²	Dietary reference value for lactating women to date ¹²
Average requirement	330 µg folate equivalents/d	-	200 µg folate equivalents/d	-
Population reference intake	500 µg folate equivalents/d	-	300 µg folate equivalents/d	-
Adequate intake	-	400 µg folate equivalents/d	-	400 µg folate equivalents/d

8.2 Explanation

In 2018, the Netherlands did not adopt the EFSA's¹⁴ dietary reference value for folate for non-pregnant and non-lactating women, choosing instead to retain the 2003 dietary reference values.¹² This also applies to the dietary reference value for pregnant women (adequate intake).³

Folate is expressed as dietary folate equivalents (DFE). The following conversion factors apply, as established in 1998 by the Institute of Medicine¹⁵: 1 µg DFE = 0.6 µg folic acid in fortified foods or folic acid that is taken as a supplement with food = 0.5 µg folic acid taken as a supplement on an empty stomach. The conversion factors do not affect the dietary reference value itself, but they can affect the calculation of the intake and the evaluation of the intake compared to the dietary reference value. In 2022, after allowing another form of folic acid, the EFSA revised the conversion factors. This revision has not been considered by the committee in this dietary reference value report.¹⁶

For the additional requirement for lactating women, the EFSA assumed a concentration of 80 µg/l of folate in breast milk, a volume of 800 ml of breast milk per day and a bioavailability of 50%. The EFSA added the result of this (rounded to 130 µg/d) to the average requirement for adult women (250 µg dietary folate equivalents/d) and used a coefficient of variation of 15% to arrive at the population reference intake of 500 µg dietary folate equivalents (DFE) per day.¹⁴ This coefficient of variation of 15% takes into account the MTHFR genotype. The 677-TT polymorphism occurs in about 25% of the population. People with this polymorphism have an increased folate requirement because the polymorphism causes a lower folate status. Because of this MTHFR polymorphism, the Dutch dietary reference value for folate for adults uses a higher coefficient of variation of 25%.^{12,17}

In the 2003 advisory report of the Health Council of the Netherlands¹², in which the existing dietary reference values for folate were derived, an additional requirement of 100 µg DFE/day was added to the population reference intake of 300 µg of folate equivalents for adult women, resulting in an adequate intake of 400 µg of folate equivalents. At the time, the Health Council of the Netherlands arrived at the additional requirement of 100 µg based on a concentration of 60 µg/l of folic acid in breast milk, a volume of 800 ml of breast milk per day and a bioavailability of 50%. The EFSA used studies that are (at least in part) more recent than the research that was available in 2003. The committee adopts the EFSA's additional requirement for folate (130 µg/d). This is added to the average requirement for non-lactating women.

Based on the coefficient of variation of 25% (as also applied to non-lactating women), the recommended amount becomes 495 µg/d, which is rounded up to 500 µg/d. This makes the recommended amount numerically similar with that of the EFSA. To date, the Netherlands has used the adequate intake of 400 µg/d. NB: If 15% were used as the coefficient of variation, as the EFSA does, the dietary reference value for lactating women would amount to 430 µg/d $(= (200 + 130) * 1.3)$.

For this topic, a quick scan of the literature on supplementation studies in lactating women was performed. This did not lead to any insights that affected the dietary reference value.

Table 10 Summary table of the dietary reference values for folate of the Netherlands, the EFSA and the NCM for lactating women

	Health Council of the Netherlands	EFSA¹⁴	NCM 2023¹
Average requirement	330 µg folate equivalents/d	380 µg folate equivalents/d	380 µg folate equivalents/d
Population reference intake	500 µg folate equivalents/d	500 µg folate equivalents/d	490 µg folate equivalents/d
Adequate intake	-	-	-

9 Vitamin B12 (cobalamin)

9.1 Overview of the Dutch dietary reference values for vitamin B12

Table 11 Summary table of the Dutch dietary reference values for vitamin B12

	Lactating women	Pregnant women ³	Non-pregnant and non-lactating women ²	Dietary reference value for lactating women to date ¹²
Average requirement	2.7 µg/d	2.4 µg/d	2.0 µg/d	2.7 µg/d
Population reference intake	3.8 µg/d	3.3 µg/d	2.8 µg/d	3.8 µg/d
Adequate intake	-	-	-	-

9.2 Explanation

The committee adopts the EFSA's additional requirement for lactating women¹⁸ and adds it to the population reference intake for non-pregnant and non-lactating women.² This is the same method as used for pregnant women.³ The additional requirement set by the EFSA was 1.0 µg/d, assuming a secretion in breast milk of 0.5 µg/l, a volume of 800 ml of breast milk per day and an absorption of 40%. As the EFSA established an adequate intake for non-pregnant and non-lactating women of 4 µg/d, the EFSA arrived at an adequate intake of 5 µg/d.

The committee calculated the average requirement for lactating women by dividing the additional requirement of 1.0 by 1.4 (based on twice the coefficient of variation of 20%). This resulted in a value of 0.71. Therefore, the average requirement for lactating women is $2+0.7 = 2.7$ µg/d. This calculation is consistent with the method used for pregnant women. Although derived differently, the values for the average requirement and population reference intake remain similar to the existing values.

NB: For this topic, a quick scan of the literature on supplementation studies in lactating women was performed. This did not lead to any insights that affected the dietary reference values.

Table 12 Summary table of the dietary reference values for vitamin B12 of the Netherlands, the EFSA and the NCM for lactating women

	Health Council of the Netherlands	EFSA ¹⁸	NCM 2023 ¹
Average requirement	2.7 µg/d	-	-
Population reference intake	3.8 µg/d		
Adequate intake	-	5.0 µg/d	5.5 µg/d

10 Vitamin C

10.1 Overview of the Dutch dietary reference values for vitamin C

Table 13 Summary table of the Dutch dietary reference values for vitamin C

	Lactating women	Pregnant women ³	Non-pregnant and non-lactating women ²	Dietary reference value for lactating women to date ⁴
Average requirement	100 mg/d	-	50 mg/d	-
Population reference intake	135 mg/d	85 mg/d	75 mg/d	-
Adequate intake	-	-	-	100 mg/d

10.2 Explanation

The committee adopts the EFSA's additional requirement for lactating women.¹⁹ This assumes a concentration of vitamin C in breast milk of 50 mg/l, a volume of 800 ml of breast milk per day and an absorption of 80% (Sections 5.6 and 6.4 of the EFSA report on vitamin C).¹⁹ This results in an additional requirement of 50 mg/d added to the average requirement for non-lactating women (50+50 = 100).¹⁹ Based on a coefficient of variation of 10% (50*1.2), the population reference intake increases by 50*1.2 = 60 mg/d (75+60 = 135 mg/d).

The Dutch values end up being lower than the EFSA's values, because in 2018 the Health Council of the Netherlands did not adopt the EFSA's dietary reference values for non-lactating women (average requirement of 80 mg/d and population reference intake of 95 mg/d), choosing instead to retain the Nordic countries' dietary reference values (2014).⁴ In 2023, the Nordic countries did adopt the EFSA's dietary reference values and opted, without additional clarification, to forgo the higher variation coefficient for women compared to men.¹

NB: According to the Dutch dietary reference values, a coefficient of variation of 25% (compared to 12.5% for Dutch men and 10% as used by the EFSA) applies to calculate the population reference intake for non-pregnant and non-lactating women. This higher coefficient of variation was chosen in 2014 for the benefit of the absorption of non-heme iron in women. From the perspective of vitamin C in breast milk, the committee does not consider it justified to apply this higher coefficient of variation to the additional requirement. On top of that, the dietary reference values of iron for lactating women are the same as those for non-lactating women. Therefore, the committee applies a coefficient of variation of 10% in relation to the additional requirement for lactating women to arrive at the population reference intake.

Table 14 Summary table of the dietary reference values for vitamin C of the Netherlands, the EFSA and the NCM for lactating women

	Health Council of the Netherlands	EFSA¹⁹	NCM 2023¹
Average requirement	100 mg/d	130 mg/d	75 mg/da
Population reference intake	135 mg/d	155 mg/d	155 mg/d
Adequate intake	-	-	-

^a The Nordic countries report an average requirement of 75 mg/day, but this may be an error in the report.

11 Vitamin D

11.1 Overview of the Dutch dietary reference values for vitamin D

Table 15 Summary table of the Dutch dietary reference values for vitamin D

	Lactating women	Pregnant women ³	Non-pregnant and non-lactating women ²	Dietary reference value for lactating women to date ²⁰
Average requirement	-	-	-	-
Population reference intake	-	-	-	-
Adequate intake	10 µg/d	10 µg/d	10 µg/d	10 µg/d

11.2 Explanation

The committee adopts the EFSA's premise²¹ that the dietary reference value for vitamin D for breastfeeding women need not be higher than for non-breastfeeding women.

In 2018, the Netherlands did not adopt the adequate intake of vitamin for adult women from the EFSA, maintaining the Dutch adequate intake of 10 µg/d from 2012.

The same was done for pregnant women. The committee also maintains 10 µg/d as the adequate intake for lactating women. These dietary reference values apply under conditions of minimal exposure to sunlight. NB: For this topic, the secretariat performed a quick scan of the literature on vitamin D supplementation studies in breastfeeding women. This did not lead to any insights that affected the dietary reference value for breastfeeding women.

Table 16 Summary table of the dietary reference values for vitamin D of the Netherlands, the EFSA and the NCM for lactating women

	Health Council of the Netherlands	EFSA ²¹	NCM 2023 ¹
Average requirement	-	-	-
Population reference intake	-	-	-
Adequate intake	10 µg/d	15 µg/d	10 µg/d

12 Vitamin E

12.1 Overview of the Dutch dietary reference values for vitamin E

Table 17 Summary table of the Dutch dietary reference values for vitamin E

	Lactating women	Pregnant women ³	Non-pregnant and non-lactating women ²	Dietary reference value for lactating women to date ⁴
Average requirement	-	-	-	-
Population reference intake	-	-	-	-
Adequate intake	11 µg α-tocopherol equivalents/d	11 µg α-tocopherol equivalents/d	11 µg α-tocopherol equivalents/d	11 µg α-tocopherol equivalents/d

12.2 Explanation

The committee adopts the EFSA's adequate intake on the premise that the dietary reference value for lactating women need not be higher than for non-lactating women.

For non-pregnant and non-lactating women as well as pregnant women, the Health Council has concluded that the dietary reference values for vitamin E are weakly substantiated and therefore do not need to be applied for public education on nutrition or for monitoring the nutrient intake across the population. The EFSA report on vitamin E²² does not contain specific information regarding deficiencies in lactating women. The committee therefore has no reason to believe that the dietary reference value for vitamin E 'merits to be applied' to specifically lactating women.

13 Vitamin K1

13.1 Overview of the Dutch dietary reference values for vitamin K1

Table 18 Summary table of the Dutch dietary reference values for vitamin K1

	Lactating women	Pregnant women ³	Non-pregnant and non-lactating women ²	Dietary reference value for lactating women to date ²³
Average requirement	-	-	-	-
Population reference intake	-	-	-	-
Adequate intake	70 µg/d	70 µg/d	70 µg/d	70 µg/d

13.2 Explanation

The committee adopts the EFSA's adequate intake²³ on the premise that the dietary reference value for lactating women need not be higher than for non-lactating women. The EFSA's dietary reference values have also been adopted for non-pregnant and non-lactating women and for pregnant women.^{2,3} In 2014, the Health Council recommended adopting the EFSA's dietary reference values as soon as they became available.²⁴ As a result, the dietary reference value remains the same as the existing one.

14 Biotin

14.1 Overview of the Dutch dietary reference values for biotin

Table 19 Summary table of the Dutch dietary reference values for biotin

	Lactating women	Pregnant women ³	Non-pregnant and non-lactating women ²	Dietary reference value for lactating women to date ²⁵
Average requirement	-	-	-	-
Population reference intake	-	-	-	-
Adequate intake	45 µg/d	40 µg/d	40 µg/d	45 µg/d

14.2 Explanation

The Health Council of the Netherlands had already recommended the EFSA's dietary reference value on an ad interim basis (since the publication of the EFSA's dietary reference values).²⁴ The committee now definitively adopts the EFSA's additional requirement.

The EFSA assumed a loss of biotin through breastfeeding of 4 µg/d (Section 6.3)²⁵, based on 800 ml of breastfeeding per day during the first six months of lactation and a concentration of 5 µg/L biotin in breast milk. This was added to the adequate intake for adult women and rounded up to 45 µg/day.

For non-pregnant and non-lactating women as well as pregnant women, the Health Council of the Netherlands has concluded that the dietary reference values for biotin are weakly substantiated and therefore do not need to be applied for public education on nutrition or for monitoring the nutrient intake across the population. In Section 2.2 of its report on biotin, the EFSA addresses data regarding deficiencies. There is no information in these requirements that specifically pertains to lactating women. The committee therefore has no reason to believe that the dietary reference value for biotin 'merits to be applied' to specifically lactating women.

15 Calcium

15.1 Overview of the Dutch dietary reference values for calcium

Table 20 Summary table of the Dutch dietary reference values for calcium

	Lactating women	Pregnant women, first 20 weeks ³	Pregnant women, second 20 weeks ³	Non-pregnant and non-lactating women ²	Dietary reference value for lactating women to date ⁷
Average requirement	Ages 18-24: 860 mg/d Ages 25-50: 750 mg/d	Ages 18-24: 860 mg/d Ages 25-50: 750 mg/d	-	Ages 18-24: 860 mg/d Ages 25-50: 750 mg/d	-
Population reference intake	Ages 18-24: 1,000 mg/d Ages 25-50: 950 mg/d	Ages 18-24: 1,000 mg/d Ages 25-50: 950 mg/d	-	Ages 18-24: 1,000 mg/d Ages 25-50: 950 mg/d	-
Adequate intake	-	-	1,000 mg/d	-	1,000 mg/d

15.2 Explanation

The committee adopts the EFSA's premise that the dietary reference value for calcium for lactating women need not be higher than for non-lactating women.²⁶

EFSA assumed that, during the lactation period, the bone calcium reserves can become somewhat depleted. There are also adaptive physiological changes in terms of enhanced calcium absorption. Supplementation studies show that supplementation cannot prevent calcium loss from bones.

For this topic, the committee performed a supplementary quick scan of the literature on calcium supplementation studies in breastfeeding women. This resulted in a relevant review.²⁷ The authors of the review concluded that calcium supplementation had no significant effect on bone density in lactating women. That conclusion is in line with the EFSA's opinion (Section 6.5 of the EFSA report).

16 Choline

16.1 Overview of the Dutch dietary reference values for choline

Table 21 Summary table of the Dutch dietary reference values for choline

	Lactating women	Pregnant women ³	Non-pregnant and non-lactating women ²	Dietary reference value for lactating women to date
Average requirement	-	-	-	-
Population reference intake	-	-	-	-
Adequate intake	520 mg/d	480 mg/d	400 mg/d	No dietary reference values in force

16.2 Explanation

The committee adopts the EFSA's additional requirement.²⁸ This is added to the adequate intake for non-lactating and non-pregnant women. To date, the Netherlands does not have any dietary reference values for choline. In Section 2.3.6.3 of its report on choline²⁸, the EFSA discusses the studies on which it based the concentration of choline in milk. On that basis, the EFSA arrived at an additional requirement of 120 mg/day.

For non-pregnant and non-lactating women as well as pregnant women, the Health Council of the Netherlands has concluded that the dietary reference values for choline are weakly substantiated and therefore do not need to be applied for public education on nutrition or for monitoring the nutrient intake across the population. In Section 2.2.2.1 of its report on choline, the EFSA addresses data regarding deficiencies. There is no information in these requirements that specifically pertains to lactating women. The committee therefore has no reason to believe that the dietary reference values for choline 'merits to be applied' to specifically lactating women.

17 Chromium (III)

In 2014, the EFSA advised that there was no need for dietary reference values for chromium (for any group).²⁹ The Netherlands adopted this recommendation, both for adults (2018)² and for pregnant women (2021).³ In line with the advice for pregnant and non-lactating women, the committee does not set a dietary reference value on chromium (III) for lactating women either.

18 Copper

18.1 Overview of the Dutch dietary reference values for copper

Table 22 Summary table of the Dutch dietary reference values for copper

	Lactating women	Pregnant women ³	Non-pregnant and non-lactating women ²	Dietary reference value for lactating women to date ⁴
Average requirement	1.0 mg/d	0.8 mg/d	0.7 mg/d	-
Population reference intake	1.3 mg/d	1.0 mg/d	0.9 mg/d	-
Adequate intake	-	-	-	1.3 mg/d

18.2 Explanation

The EFSA arrived at a copper secretion through breastfeeding of 280 µg/d.³⁰

The EFSA used an absorption factor of 50%, bringing the total amount that should be compensated through the diet to 560 µg/d. However, the EFSA argued that only 200 µg needed to be added to the adequate intake for adults, because it had already taken into account the build-up of copper reserves during pregnancy (included in the dietary reference values for pregnant women) to support the lactation period.

The Health Council adopted the IOM's derivation for adult women. For pregnant women, the Health Council also adopted the additional IOM requirement, which does not include building up copper reserves for the lactation period during pregnancy.

The committee ruled at the time that there was insufficient evidence to support the need to build up copper reserves for the lactation period during pregnancy.

The committee also opted for the IOM's additional requirement for lactating women (0.3 mg/d, which is slightly higher than the EFSA's). This makes the population reference intake the same as the adequate intake in place until now.

The IOM assumed a copper secretion of 200 µg/d in breast milk (likely based on 750 ml of breast milk per day, though not explicitly stated). The IOM applied an absorption factor of 67%, resulting in an additional requirement of 0.3 mg/d. To arrive at the population reference intake, a coefficient of variation of 15% was applied, so the population reference intake = (average requirement women (0.7) + (0.2/0.67))*1.3 = 1.3 mg/d. If 800 ml/d were assumed, the secretion would be 0.213 mg/d and (calculated using the same absorption factor and coefficient of variation as the IOM) the population reference intake would be 1.323 mg/d.

Table 23 Summary table of the dietary reference values for copper of the Netherlands, the EFSA and the NCM for lactating women

	Health Council of the Netherlands	EFSA ³⁰	NCM 2023 ¹
Average requirement	1.0 mg/d	-	-
Population reference intake	1.3 mg/d	-	-
Adequate intake	-	1.5 mg/d	1.3 mg/d

19 Fluoride

In 2018, the Health Council² did not adopt the EFSA's 2013 dietary reference values³¹ and chose not to derive a dietary reference value for fluoride for the Netherlands. In 2021, the Netherlands did not derive a dietary reference value for fluoride for pregnant women either.³ This is because, in the Netherlands, oral hygiene products contain fluoride for the prevention of dental caries, which has a local effect. This means that fluoride intake from food is not necessary. As for other adults, the committee does not set a dietary reference value for fluoride for lactating women.

20 Iron

20.1 Overview of the Dutch dietary reference values for iron

Table 24 Summary table of the Dutch dietary reference values for iron

	Lactating women	Pregnant women ³	Non-pregnant and non-lactating women ²	Dietary reference value for lactating women to date ⁴
Average requirement	7 mg/d	7 mg/d	7 mg/d	-
Population reference intake	16 mg/d	16 mg/d	16 mg/d	-
Adequate intake	-	-	-	15 mg/d

20.2 Explanation

The committee agrees with the EFSA's reasoning³² that the average requirement and recommended amount of iron for lactating women should be as high as for non-lactating, pre-menopausal women. Assuming that menstruation has not yet started after pregnancy, the total iron loss in lactating women is estimated at 1.3 mg/d (iron excretion through breast milk of 0.24 mg/d, iron concentration in breast milk of 0.3 ml/l and 'basal losses' of 1.08 mg/d). This loss is slightly lower than in non-lactating women, but this is offset by the need to replenish iron reserves after childbirth.

21 Iodine

21.1 Overview of the Dutch dietary reference values for iodine

Table 25 Summary table of the Dutch dietary reference values for iodine

	Lactating women	Pregnant women ³	Non-pregnant and non-lactating women ²	Dietary reference value for lactating women to date ⁴
Average requirement	-	-	-	-
Population reference intake	-	-	-	-
Adequate intake	200 µg/d	200 µg/d	150 µg/d	200 µg/d

21.2 Explanation

The committee agrees with the additional requirement of 50 µg/d that the EFSA added to the adequate intake for non-lactating and non-pregnant women.³³ The iodine concentration in breast milk varies widely between European women. Iodine losses through breast milk are estimated at 60-90 µg/d. However, the dietary reference value for non-lactating and non-pregnant women focuses on having a sufficient iodine reserve in the thyroid gland. According to the EFSA, these significant body reserves mean that the iodine loss during lactation does not have to be completely compensated for by the dietary reference values. The EFSA therefore applied the same dietary reference value for iodine for pregnant women as for lactating women.

NB: For this topic, a quick scan of the literature on supplementation studies in lactating women was performed. This did not lead to any insights that affected the dietary reference value.

22 Magnesium

22.1 Overview of the Dutch dietary reference values for magnesium

Table 26 Summary table of the Dutch dietary reference values for magnesium

	Lactating women	Pregnant women ³	Non-pregnant and non-lactating women ²	Dietary reference value for lactating women to date ⁴
Average requirement	-	-	-	-
Population reference intake	-	-	-	-
Adequate intake	300 mg/d	300 mg/d	300 mg/d	280 mg/d

22.2 Explanation

The committee adopts the EFSA's opinion³⁴ that the dietary reference value for lactating women need not be higher than for other women and arrives at an adequate intake of 300 mg/d. The EFSA's adequate intakes for adult women and pregnant women had already been adopted.^{2,3}

23 Manganese

23.1 Overview of the Dutch dietary reference values for manganese

Table 27 Summary table of the Dutch dietary reference values for manganese

	Lactating women	Pregnant women ³	Non-pregnant and non-lactating women ²	Dietary reference value for lactating women to date ³⁵
Average requirement	-	-	-	-
Population reference intake	-	-	-	-
Adequate intake	3 mg/d	3 mg/d	3 mg/d	3 mg/d

23.2 Explanation

The committee adopts the EFSA's opinion that the dietary reference value for lactating women need not be higher than for other women and arrives at an adequate intake of 3 mg/d.

For non-pregnant and non-lactating women as well as pregnant women, the Health Council of the Netherlands has concluded that the dietary reference values for manganese are poorly substantiated and therefore do not need to be applied for public education on nutrition and for monitoring the nutrient intake across the population. In Section 2.2.2.1 of its report on manganese³⁵, the EFSA addresses data regarding deficiencies. There is no information in these requirements that specifically pertains to lactating women. The committee therefore has no reason to believe that the dietary reference value for manganese 'merits to be applied' to specifically lactating women.

At the time of the temporary dietary reference values in 2014, the EFSA's values for manganese had already been adopted in the Netherlands (for all groups).²⁴ Therefore, the current adequate intake for lactating women in the Netherlands is already equal to that of the EFSA.

24 Molybdenum

24.1 Overview of the Dutch dietary reference values for molybdenum

Table 28 Summary table of the Dutch dietary reference values for molybdenum

	Lactating women	Pregnant women ³	Non-pregnant and non-lactating women ²	Dietary reference value for lactating women to date ³⁶
Average requirement	-	-	-	-
Population reference intake	-	-	-	-
Adequate intake	65 µg/d	65 µg/d	65 µg/d	65 µg/d

24.2 Explanation

The committee adopts the EFSA's opinion that the dietary reference value for lactating women need not be higher than for other women and arrives at an adequate intake of 65 µg/d.

For non-pregnant and non-lactating women as well as pregnant women, the Health Council of the Netherlands has concluded that the dietary reference values for molybdenum are poorly substantiated and therefore do not need to be applied for public education on nutrition or for monitoring the nutrient intake across the population. In Section 2.2.2.1 of its report on molybdenum³⁶, the EFSA addresses data regarding deficiencies. There is no information in these requirements that specifically pertains to lactating women. The committee therefore has no reason to believe that the dietary reference value for molybdenum 'merits to be applied' to specifically lactating women.

At the time of the temporary dietary reference values in 2014, the EFSA's values for molybdenum had already been adopted in the Netherlands (for all groups).²⁴ Therefore, the current adequate intake for lactating women in the Netherlands is already equal to that of the EFSA.

25 Phosphorus

25.1 Overview of the Dutch dietary reference values for phosphorus

Table 29 Summary table of the Dutch dietary reference values for phosphorus

	Lactating women	Pregnant women ³	Non-pregnant and non-lactating women ²	Dietary reference value for lactating women to date ⁴
Average requirement	-	-	-	-
Population reference intake	-	-	-	-
Adequate intake	550 mg/d	550 mg/d	550 mg/d	900 mg/d

25.2 Explanation

The NCM's 2012 dietary reference values for phosphorus for infants and children have applied since 2014.²⁴ For adults and non-pregnant and non-lactating women, the Health Council of the Netherlands has now adopted the adequate intakes levels of the EFSA.^{2,3} Since 2023, the Nordic countries have also adopted the EFSA's dietary reference values for phosphorus (for all groups).³⁷

The committee adopts the EFSA's opinion that, due to physiological adaptations during lactation, the dietary reference value for lactating women need not be higher than for other women and arrives at an adequate intake of 550 mg/d.

For non-pregnant and non-lactating women as well as pregnant women, the Health Council of the Netherlands has concluded that the dietary reference values for phosphorus are weakly substantiated and therefore do not need to be applied for public education on nutrition or for monitoring the nutrient intake across the population.

In Section 2.2.2.1 of its report on phosphorus³⁷, the EFSA addresses data regarding deficiencies. There is no information in these requirements that specifically pertains to lactating women. The committee therefore has no reason to believe that the dietary reference value for phosphorus 'merits to be applied' to specifically lactating women.

26 Potassium

26.1 Overview of the Dutch dietary reference values for potassium

Table 30 Summary table of the Dutch dietary reference values for potassium

	Lactating women	Pregnant women ³	Non-pregnant and non-lactating women ²	Dietary reference value for lactating women to date ⁴
Average requirement	-	-	-	-
Population reference intake	-	-	-	-
Adequate intake	3.5 g/d	3.5 g/d	3.5 g/d	3.1 g/d

26.2 Explanation

The EFSA applied a higher dietary reference value for potassium for breastfeeding women than for other adults. The EFSA³⁸ based its additional requirement during lactation on a small study showing that the body's potassium reserves decrease in breastfeeding women. For this reason, the EFSA increased the dietary reference value by the amount of potassium excreted through breast milk. The EFSA indicates that this approach is conservative (Section 6.4 of its report on potassium). The committee, like the Nordic countries in 2023, does not find this higher requirement sufficiently substantiated and arrives at an adequate intake of 3.5 g/d, which is equal to the adequate intake for other adults. This represents a small increase compared to the dietary reference value to date (3.1 g/d).

Table 31 Summary table of the dietary reference values for potassium of the Netherlands, the EFSA and the NCM for lactating women

	Health Council of the Netherlands	EFSA ³⁸	NCM 2023 ¹
Average requirement	-	-	-
Population reference intake	-	-	-
Adequate intake	3.5 g/d	4.0 g/d	3.5 g/d

27 Selenium

27.1 Overview of the Dutch dietary reference values for selenium

Table 32 Summary table of the dietary reference values for selenium

	Lactating women	Pregnant women ³	Non-pregnant and non-lactating women ²	Dietary reference value for lactating women to date ⁴
Average requirement	-	-	-	-
Population reference intake	-	-	-	-
Adequate intake	85 µg/d	70 µg/d	70 µg/d	60 µg/d

27.2 Explanation

The committee adopts the EFSA's additional requirement for lactating women. In Section 5.3 of its report on selenium, the EFSA specifies that when determining the additional requirement, it assumed a concentration of 15 µg/L and a volume of 800 ml of breast milk per day.³⁹ It therefore assumed a secretion of 12 µg/day in the first six months of breastfeeding. The EFSA indicates that there is no specific information on the efficiency of selenium absorption in lactating women (Section 6.4 of its report on selenium). Therefore, the EFSA assumed an absorption efficiency of 70% from 'usual diets' based on the data from non-lactating women. A combination of these data leads to an additional requirement of 15 µg/day.

28 Zinc

28.1 Overview of the Dutch dietary reference values for zinc

Table 33 Summary table of the Dutch dietary reference values for zinc

	Lactating women	Pregnant women ³	Non-pregnant and non-lactating women ²	Dietary reference value for lactating women to date ⁴
Average requirement	8.1 mg/d	7.0 mg/d	5.7 mg/d	-
Population reference intake	9.9 mg/d	9.1 mg/d	7.0 mg/d	-
Adequate intake	-	-	-	11 mg/d

28.2 Explanation

The committee adopts the EFSA's additional requirement for lactating women. The EFSA assumed a zinc loss through breastfeeding of 1.1 mg/d.⁴⁰ An absorption of 45% was used to determine an additional requirement. This resulted in an additional requirement of 2.4 mg/d added to the average requirement for non-lactating women. Using a coefficient of variation of 10% (2.4×1.2), this resulted in an addition of 2.9 mg/d to the recommended amount for non-lactating women. The Netherlands did not adopt the EFSA's dietary reference values for adult women. The EFSA derived its dietary reference values based on four phytate levels in the diet. The Netherlands did not use this approach, because the committee found the role of phytate to be overstated and there are also no known phytate levels in the Dutch diet. In addition, the EFSA's dietary reference values for zinc were high relative to those of the NCM 2014, while the committee did not find the health benefits of higher dietary reference values sufficiently clear.

Table 34 Summary table of the dietary reference values for zinc of the Netherlands, the EFSA and the NCM for lactating women

	Health Council of the Netherlands	EFSA (phytate mg/d) ⁴⁰	NCM 2023 (phytate mg/d) ¹
Average requirement	8.1 mg/d	6.2+2.4 (300) 7.6+2.4 (600) 8.9+2.4 (900) 10.2+2.4 (1,200)	10.5 mg/d (600)
Population reference intake	9.9 mg/d	7.5+2.9 (300) 9.3+2.9 (600) 11.0+2.9 (900) 12.7+2.9 (1,200)	12.6 mg/d (600)
Adequate intake	-	-	-

References

- 1 Blomhoff R, Andersen R, Arnesen EK, Christensen JJ, Eneroth H, Erkkola M, et al. *Nordic Nutrition Recommendations 2023. Integrating environmental aspects*. Copenhagen: Nordic Council of Ministers, 2023.
- 2 Gezondheidsraad. *Voedingsnormen voor vitamines en mineralen voor volwassenen*. Den Haag, 2018; publicatienr. 2018/19.
- 3 Gezondheidsraad. *Voedingsnormen voor vitamines en mineralen voor zwangere vrouwen*. Den Haag: Gezondheidsraad 2021; publicatienr. 2021/27.
- 4 Nordic Council of Ministers (NCM). *Nordic Nutrition Recommendations 2012. Integrating nutrition and physical activity*. 2014; 2014:002.
- 5 EFSA Panel on Dietetic Products, Nutrition, and Allergies (NDA). *Scientific Opinion on Dietary Reference Values for vitamin A*. EFSA Journal 2015; 13(3): 4028.
- 6 Tanumihardjo SA, Russell RM, Stephensen CB, Gannon BM, Craft NE, Haskell MJ, et al. *Biomarkers of Nutrition for Development (BOND)-Vitamin A Review*. J Nutr 2016; 146(9): 1816S-1848S.
- 7 Gezondheidsraad. *Voedingsnormen: calcium, vitamine D, thiamine, riboflavine, niacine, pantotheenzuur en biotine*. Den Haag, 2000; 2000/12.
- 8 EFSA Panel on Dietetic Products, Nutrition, and Allergies (NDA). *Dietary reference values for thiamin*. EFSA Journal 2016; 14(12): e04653.
- 9 EFSA Panel on Dietetic Products, Nutrition, and Allergies (NDA). *Dietary Reference Values for riboflavin*. EFSA Journal 2017; 15(8): e04919.
- 10 EFSA Panel on Dietetic Products, Nutrition, and Allergies (NDA). *Scientific Opinion on Dietary Reference Values for niacin*. EFSA Journal 2014; 12(7): 3759.
- 11 EFSA Panel on Dietetic Products, Nutrition, and Allergies (NDA). *Scientific Opinion on Dietary Reference Values for pantothenic acid*. EFSA Journal 2014; 12(2): 3581.
- 12 Gezondheidsraad. *Voedingsnormen: vitamine B6, foliumzuur en vitamine B12*. Den Haag, 2003; publicatienr. 2003/04.
- 13 EFSA Panel on Dietetic Products, Nutrition, and Allergies (NDA). *Dietary Reference Values for vitamin B6*. EFSA Journal 2016; 14(6): e04485.
- 14 EFSA Panel on Dietetic Products, Nutrition, and Allergies (NDA). *Scientific Opinion on Dietary Reference Values for folate*. EFSA Journal 2014; 12(11): 3893.
- 15 Standing Committee on the Scientific Evaluation of Dietary Reference Intakes and its Panel on Folate, Other B Vitamins, and Choline and Subcommittee on Upper Reference Levels of Nutrients Food and Nutrition Board Institute of Medicine (IOM). *Dietary Reference Intakes for thiamin, riboflavin, niacin, vitamin B6, folate, vitamin B12, pantothenic acid, biotin, and choline*. Washington DC: National Academy Press, 1998.

- 16 EFSA Panel on Dietetic Products, Nutrition, and Allergies (NDA). *Conversion of calcium-L-methylfolate and (6S)-5-methyltetrahydrofolic acid glucosamine salt into dietary folate equivalents*. 2022; 1831-4732.
<https://efsa.onlinelibrary.wiley.com/doi/abs/10.2903/j.efsa.2022.7452>.
- 17 The Health Council of the Netherlands. *An evaluation of the EFSA's dietary reference values (DRVs), Part 1, Dietary reference values for vitamins and minerals for adults*. The Hague, 2018; publication no. 2018/19A.
- 18 EFSA Panel on Dietetic Products, Nutrition, and Allergies (NDA). *Scientific Opinion on Dietary Reference Values for cobalamin (vitamin B12)*. EFSA Journal 2015; 13(7): 4150.
- 19 EFSA Panel on Dietetic Products, Nutrition, and Allergies (NDA). *Scientific Opinion on Dietary Reference Values for vitamin C*. EFSA Journal 2013; 11(11): 3418.
- 20 Gezondheidsraad. *Evaluatie van de voedingsnormen voor vitamine D*. Den Haag, 2012; publicatiennr. 2012/15.
- 21 EFSA Panel on Dietetic Products, Nutrition, and Allergies (NDA). *Dietary reference values for vitamin D*. EFSA Journal 2016; 14(10): e04547.
- 22 EFSA Panel on Dietetic Products, Nutrition, and Allergies (NDA). *Scientific Opinion on Dietary Reference Values for vitamin E as α -tocopherol*. EFSA Journal 2015; 13(7): 4149.
- 23 EFSA Panel on Dietetic Products, Nutrition, and Allergies (NDA). *Dietary reference values for vitamin K*. EFSA Journal 2017; 15(5): e04780.
- 24 Gezondheidsraad. *Tijdelijke voedingsnormen*.
<https://www.gezondheidsraad.nl/documenten/overige/2014/10/16/tijdelijke-voedingsnormen-2014>.
- 25 EFSA Panel on Dietetic Products, Nutrition, and Allergies (NDA). *Scientific Opinion on Dietary Reference Values for biotin*. EFSA Journal 2014; 12(2): 3580.
- 26 EFSA Panel on Dietetic Products, Nutrition, and Allergies (NDA). *Scientific Opinion on Dietary Reference Values for calcium*. EFSA Journal 2015; 13(5): 4101.
- 27 Cai G, Tian J, Winzenberg T, Wu F. *Calcium supplementation for improving bone density in lactating women: a systematic review and meta-analysis of randomized controlled trials*. Am J Clin Nutr 2020; 112(1): 48-56.
- 28 EFSA Panel on Dietetic Products, Nutrition, and Allergies (NDA). *Dietary Reference Values for choline*. EFSA Journal 2016; 14(8): e04484.
- 29 EFSA Panel on Dietetic Products, Nutrition, and Allergies (NDA). *Scientific Opinion on Dietary Reference Values for chromium*. EFSA Journal 2014; 12(10): 3845.
- 30 EFSA Panel on Dietetic Products, Nutrition, and Allergies (NDA). *Scientific Opinion on Dietary Reference Values for copper*. EFSA Journal 2015; 13(10): 4253.
- 31 EFSA Panel on Dietetic Products, Nutrition, and Allergies (NDA). *Scientific Opinion on Dietary Reference Values for fluoride*. EFSA Journal 2013; 11(8): 3332.

- 32 EFSA Panel on Dietetic Products, Nutrition, and Allergies (NDA). *Scientific Opinion on Dietary Reference Values for iron*. EFSA Journal 2015; 13(10): 4254.
- 33 EFSA Panel on Dietetic Products, Nutrition, and Allergies (NDA). *Scientific Opinion on Dietary Reference Values for iodine*. EFSA Journal 2014; 12(5): 3660.
- 34 EFSA Panel on Dietetic Products, Nutrition, and Allergies (NDA). *Scientific Opinion on Dietary Reference Values for magnesium*. EFSA Journal 2015; 13(7): 4186.
- 35 EFSA Panel on Dietetic Products, Nutrition, and Allergies (NDA). *Scientific Opinion on Dietary Reference Values for manganese*. EFSA Journal 2013; 11(11): 3419.
- 36 EFSA Panel on Dietetic Products, Nutrition, and Allergies (NDA). *Scientific Opinion on Dietary Reference Values for molybdenum*. EFSA Journal 2013; 11(8): 3333.
- 37 EFSA Panel on Dietetic Products, Nutrition, and Allergies (NDA). *Scientific Opinion on Dietary Reference Values for phosphorus*. EFSA Journal 2015; 13(7): 4185.
- 38 EFSA Panel on Dietetic Products, Nutrition, and Allergies (NDA). *Dietary reference values for potassium*. EFSA Journal 2016; 14(10): e04592.
- 39 EFSA Panel on Dietetic Products, Nutrition, and Allergies (NDA). *Scientific Opinion on Dietary Reference Values for selenium*. EFSA Journal 2014; 12(10): 3846.
- 40 EFSA Panel on Dietetic Products, Nutrition, and Allergies (NDA). *Scientific Opinion on Dietary Reference Values for zinc*. EFSA Journal 2014; 12(10): 3844.

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