

APPENDIX 1

Table 1 Recommended nutrient intakes – minerals*

Age	Calcium	Magnesium	Selenium	Zinc			Iron (i)				Iodine
	(c) mg/day	mg/day	µg/day	High bioavail-ability mg/day	Moderate bioavail-ability mg/day	Low bioavail-ability mg/day	15% bio-availability mg/day	12% bio-availability mg/day	10% bio-availability mg/day	5% bio-availability mg/day	(o) µg/day
Infants											
Premature											30 (p) µg/kg/day
0 - 6 months	300 (a) 400 (b)	26 (a) 36 (b)	6	1.1 (e)	2.8 (f)	6.6 (g)	(k)	(k)	(k)	(k)	15 (p)µg/kg/day
7-11 months	400	53	10	0.8 (e) 2.5 (h)	4.1 (h)	8.3 (h)	[6] (l)	[8] (l)	[9] (l)	[19] (l)	135
Children											
1-3 years	500	60	17	2.4	4.1	8.4	4	5	6	12	75
4-6 years	600	73	21	3.1	5.1	10.3	4	5	6	13	110
7-9 years	700	100	21	3.3	5.6	11.3	6	7	9	18	100
Adolescents											
Males 10 - 18 years	1,300 (d)	250	34	5.7	9.7	19.2	10 (10-14 yrs) 12 (15-18 yrs)	12 (10-14 yrs) 16 (15-18 yrs)	15 (10-14 yrs) 19 (15-18 yrs)	29 (10-14 yrs) 38 (15-18 yrs)	135 (10-11 yrs) 110 (12 + yrs)
Females 10 - 18 years	1,300 (d)	230	26	4.6	7.8	15.5	9 (10-14 yrs) (m) 22 (10-14 yrs) 21 (15-18 yrs)	12 (10-14 yrs) (m) 28 (10-14 yrs) 26 (15-18 yrs)	14 (10-14 yrs) (m) 33 (10-14 yrs) 31 (15-18 yrs)	28 (10-14 yrs) (m) 65 (10-14 yrs) 62 (15-18 yrs)	140 (10-11 yrs) 100 (12 + yrs)
Adults											
Males 19 - 65 years	1,000	260	34	4.2	7.0	14.0	9	11	14	27	130
Females 19 - 50 years (pre-menopausal)	1,000	220	26	3.0	4.9	9.8	20	24	29	59	110
51 – 65 years (menopausal)	1,300	220	26	3.0	4.9	9.8	8	9	11	23	110
Older adults											
Males 65 + years	1,300	230	34	4.2	7.0	14.0	9	11	14	27	130
Females 65 + years	1,300	190	26	3.0	4.9	9.8	8	9	11	23	110
Pregnancy											
First trimester		220		3.4	5.5	11.0	(n)	(n)	(n)	(n)	200
Second trimester		220	28	4.2	7.0	14.0	(n)	(n)	(n)	(n)	200
Third trimester	1,200	220	30	6.0	10.0	20.0	(n)	(n)	(n)	(n)	200
Lactation											
0-3 months	1,000	270	35	5.8	9.5	19.0	10	12	15	30	200
4-6 months	1,000	270	35	5.3	8.8	17.5	10	12	15	30	200
7-12 months	1,000	270	42	4.3	7.2	14.4	10	12	15	30	200

* For the purposes of the composite tables of RNI values, the body weights used were derived from the 50th percentile of NCHS data until adult weights of 55 kg for females and 65 kg for males were reached. The weights used are the following: 0-6 mo = 6 kg; 7–12 mo = 8.9 kg; 1-3 yo = 12.1 kg; 4-6 yo = 18.2 kg; 7-9 yo = 25.2 kg; 10-11 yo M = 33.4 kg; 10-11 yo F = 34.8 kg; 12-18 yo M = 55.1 kg; 12-18 yo F = 50.6 kg; 10-18 yo M = 55.1 kg; 10-18 yo F = 50.6 kg; 19-65 yo M = 65 kg; 19-65 yo F = 55 kg

Notes - Minerals

- (a) Human breast milk.
- (b) Infant formula.

Calcium:

- (c) The data used in developing calcium RNIs originate from developed countries, and there is controversy as to their appropriateness for developing countries. This notion also holds true for most nutrients, but based on current knowledge, the impact appears to be most marked for calcium.
- (d) Particularly during the growth spurt.

Zinc:

- (e) Human-milk fed infants only.
- (f) Formula-fed infants, moderate zinc bio-availability.
- (g) Formula-fed infants, low zinc bio-availability due to infant consumption of phytate rich cereals and vegetable protein based formula.
- (h) Not applicable to infants consuming human milk only.

Iron:

- (i) There is evidence that iron absorption can be significantly enhanced when each meal contains a minimum of 25 mg of Vitamin C, assuming three meals per day. This is especially true if there are iron absorption inhibitors in the diet such as phytate or tannins.
- (k) Neonatal iron stores are sufficient to meet the iron requirement for the first six months in full term infants. Premature infants and low birth weight infants require additional iron.
- (l) Bio-availability of dietary iron during this period varies greatly.
- (m) Non-menstruating adolescents.
- (n) It is recommended that iron supplements in tablet form be given to all pregnant women because of the difficulties in correctly evaluating iron status in pregnancy. In the non-anaemic pregnant woman, daily supplements of 100 mg of iron (e.g., as ferrous sulphate) given during the second half of pregnancy are adequate. In anaemic women higher doses are usually required.

Iodine

- (o) Data expressed on a per kg body weight basis is sometimes preferred, and this data is as follows:

<u>premature infants</u> = 30 µg/kg/day	<u>infants 0-12 months</u> = 19 µg/kg/day
<u>children 1 - 6 years</u> = 6 µg/kg/day	<u>children 7 - 11</u> = 4 µg/kg/day
<u>adolescents and adults 12 + years</u> = 2 µg/kg/day	<u>pregnancy and lactation</u> = 3.5 µg/kg/day
- (p) In view of the high variability in body weights at these ages the RNIs are expressed as µg/kg body weight/day.

(NCHS data source: WHO, Measuring Change in Nutritional Status. Guidelines for Assessing the Nutritional Impact of Supplementary Feeding Programmes for Vulnerable Groups, World Health Organization, 1983)

Table 2

Recommended nutrient intakes ^{(g) (h)} – water and fat soluble vitamins*

Age	WATER-SOLUBLE VITAMINS							FAT-SOLUBLE VITAMINS					
	Thiamin <i>mg/day</i>	Riboflavin <i>mg/day</i>	Niacin (a) <i>mg NE/day</i>	Vit. B ₆ <i>mg/day</i>	Panto- thenate <i>mg/day</i>	Biotin <i>µg/day</i>	Folate (c) <i>µg DFE/day</i>	Vit. B ₁₂ <i>µg/day</i>	Vit. C (d) <i>mg/day</i>	Vit. A (f) (g) <i>µg RE/day</i>	Vit. D <i>µg/day</i>	Vit. E (acceptable intakes) (h) <i>mg α-TE/ day</i>	Vit. K (l) <i>µg/day</i>
Infants													
0 - 6 months	0.2	0.3	2 (b)	0.1	1.7	5	80	0.4	25	375	5	2.7 (i)	5 (m)
7-11 months	0.3	0.4	4	0.3	1.8	6	80	0.5	30	400	5	2.7 (i)	10
Children													
1-3 years	0.5	0.5	6	0.5	2	8	160	0.9	30	400	5	5 (k)	15
4-6 years	0.6	0.6	8	0.6	3	12	200	1.2	30	450	5	5 (k)	20
7-9 years	0.9	0.9	12	1.0	4	20	300	1.8	35	500	5	7 (k)	25
Adolescents													
10-18 years													
Males	1.2	1.3	16	1.3	5	25	400	2.4	40	600	5	10	35-65
Females	1.1	1.0	16	1.2	5	25	400	2.4	40	600	5	7.5	35-55
Adults													
Males	1.2	1.3	16	1.3 (19-50 yrs) 1.7 (50+ yrs)	5	30	400	2.4	45	600	5 (19-50 yrs) 10 (50+ yrs)	10	65
Females													
19-50 years (pre- menopausal)	1.1	1.1	14	1.3	5	30	400	2.4	45	500	5	7.5	55
51-65 years (menopausal)	1.1	1.1	14	1.5	5	30	400	2.4	45	500	10	7.5	55
Older adults, 65 + years													
Males	1.2	1.3	16	1.7	5		400	2.4	45	600	15	10	65
Females	1.1	1.1	14	1.5	5		400	2.4	45	600	15	7.5	55
Pregnancy	1.4	1.4	18	1.9	6	30	600	2.6	55	800	5	(i)	55
Lactation	1.5	1.6	17	2.0	7	35	500	2.8	70 (e)	850	5	(i)	55

* For the purposes of these composite tables of RNI values, the body weights used were derived from the 50th percentile of NCHS data until adult weights of 55 kg for females and 65 kg for males were reached. The weights used are the following: 0-6 mo = 6 kg; 7-12 mo = 8.9 kg; 1-3 yo = 12.1 kg; 4-6 yo = 18.2 kg; 7-9 yo = 25.2 kg; 10-11 yo M = 33.4 kg; 10-11 yo F = 34.8 kg; 12-18 yo M = 55.1 kg; 12-18 yo F = 50.6 kg; 10-18 yo M = 55.1 kg; 10-18 yo F = 50.6 kg; 19-65 yo M = 65 kg; 19-65 yo F = 55 kg

Notes - Vitamins

Niacin

- (a) NE = niacin equivalents, 60-to-1 conversion factor for tryptophan to niacin.
- (b) Preformed niacin.

Folate

- (c) DFE = dietary folate equivalents; μg of DFE provided = [μg of food folate + (1.7 x μg of synthetic folic acid)].

Vitamin C

- (d) An RNI of 45 mg was calculated for adult men and women and 55 mg recommended during pregnancy. It is recognised however that larger amounts would promote greater iron absorption if this can be achieved.
- (e) An additional 25 mg is needed for lactation.

Vitamin A:

- (f) Vitamin A values are "recommended safe intakes" instead of RNIs. This level of intake is set to prevent clinical signs of deficiency, allow normal growth, but does not allow for prolonged periods of infections or other stresses.
- (g) Recommended safe intakes as μg RE/day; 1 μg retinol=1 μg RE; 1 μg β -carotene=0.167 μg RE; 1 μg other provitamin A carotenoids=0.084 μg RE.

Vitamin E:

- (h) Data were considered insufficient to formulate recommendations for this vitamin so that "acceptable intakes" are listed instead. This represents the best estimate of requirements, based on the currently acceptable intakes that support the known function of this vitamin.
- (i) For pregnancy and lactation there is no evidence of requirements for vitamin E that are any different from those of older adults. Increased energy intake during pregnancy and lactation is expected to compensate for increased need for infant growth and milk synthesis. Breast milk substitutes should not contain less than 0.3 mg α -tocopherol equivalents (TE)/100 ml of reconstituted product, and not less than 0.4 mg TE/g PUFA. Human breast milk vitamin E is fairly constant at 2.7 mg for 850 ml of milk.
- (k) Values based on a proportion of the adult acceptable intakes.

Vitamin K:

- (l) The RNI for each age group is based on a daily intake of 1 $\mu\text{g}/\text{kg}/\text{day}$ of phylloquinone, the latter being the major dietary source of Vitamin K.
- (m) This intake cannot be met by infants who are exclusively breast-fed. To prevent bleeding due to vitamin K deficiency, all breast fed babies should receive vitamin K supplementation at birth according to nationally approved guidelines.

(NCHS data source: WHO, Measuring Change in Nutritional Status. Guidelines for Assessing the Nutritional Impact of Supplementary Feeding Programmes for Vulnerable Groups, World Health Organization, 1983)