EUROPEAN COMMISSION
HEALTH & CONSUMER PROTECTION DIRECTORATE-GENERAL

Directorate C - Scientific Opinions
C2 - Management of scientific Committees; scientific co-operation and networks

Scientific Committee on Food

SCF/CS/NUT/GEN/18 Final
6 March 2003

Opinion of the Scientific Committee on Food on the revision of reference values for nutrition labelling

(expressed on 5 March 2003)

B-1049 Bruxelles/Brussels - Belgium
Telephone: direct line (+32-2) 29 599.10/659.48/648.70, exchange 299.11.11. Fax: (+32-2) 299.48.91
Telex: COMEU B 21877. Telegraphic address: COMEUR Brussels.
http://europa.eu.int/comm/food/fs/sc/scf/index_en.html

Opinion of the Scientific Committee on Food on the revision of reference values for nutrition labelling

(expressed on 5 March 2003)

1. TERMS OF REFERENCE

The Committee is asked to make recommendations for reference nutrient values for vitamins and minerals to be used for labelling purposes. The Committee should also take into account scientific developments and relevant data from Member States and elsewhere on reference intakes for the population.

2. BACKGROUND

Community legislation on nutrition labelling of most foods is laid down in Council Directive 90/496/EEC[8] (hereinafter referred to as "the nutrition labelling Directive"). With regard to vitamins and minerals, the legislation indicates that any of the minerals and vitamins listed in the Directive and present in significant amounts[i] as defined in the nutrition labelling Directive may be included in the nutrition labelling. If information on the amount of vitamins and minerals is included it must be expressed in absolute numbers, in the units as specified in the nutrition labelling Directive per 100 g or per 100 mL of the food as sold or as prepared for consumption, if there are specific instructions for the preparation. In addition, information on vitamins and minerals must also be expressed as a percentage of the reference labelling value referred to as "Recommended Daily Allowance" (RDA). The Annex of the nutrition labelling Directive includes a list of reference labelling values for 18 vitamins and minerals. These values are based on the FAO/WHO expert consultation[1] on recommended nutrient reference values for labelling purposes held in Helsinki in 1988 and are included as Nutrient Reference Values in the Codex Alimentarius Guidelines on Nutrition Labelling[2].

Reference values for nutrition labelling are also included in the specific Directives on infant formulae and follow-on formula (Directive 91/321/EEC[5] as amended by Directive 96/4/EC[6]) and Directive 96/5/EC[7] on processed cereal-based foods and baby foods for infants and young children (weaning foods). The reference labelling values in these Directives are based on the recommendations in the SCF opinion on nutrients and energy intakes for the European Community, which were based on the Population Reference Intakes (PRIs) for children aged between 6 months and 3 years[4]. The Directives specify that when the content of vitamins or minerals per 100 mL or per 100 g of follow-on formula or weaning food as sold and as ready for consumption is greater than 15% of the reference labelling value then the content may be declared as a percentage of that reference value.

The European Commission's White Paper on Food Safety[3] indicated that there would be a proposal amending the nutrition labelling Directive. Therefore, the vitamin and mineral list in the current community legislation should be reviewed and, if appropriate, updated and extended.

[i] Directive 90/496/EEC suggests that as a rule 15% of the recommended allowance per 100 g or 100 mL or per package (if the package contains only a single portion) should be taken into consideration in deciding what constitutes a significant amount.

3. RECOMMENDED DAILY ALLOWANCE (RDA) AND POPULATION REFERENCE INTAKE (PRI): DEFINITIONS

The SCF opinion on nutrient and energy intakes for the European Community defined several nutrient recommended values including the Average Requirement (AR) and the Population Reference Intake (PRI)[4]. The AR is the average requirements for a nutrient of a population group according to the criterion of adequacy chosen. The PRIs, in most countries called Recommended Daily Allowances (RDAs), are based on the principle that most, if not all, individuals of a population or a specific population group should obtain an adequate nutrient intake to satisfy their requirements. Such recommended values are generally based on the principle of the average requirement plus two Standard Deviations (SD) for the nutrient in the population group. The RDAs/PRIs are used as the basis for provision of dietary advice to individuals or population groups or when prescribing diets or for the provision of food supplies, for example school meals. The report also refers to a range of safe and adequate intakes which are established when a nutrient is considered essential but it is not possible to identify the individual requirements. The level may be the observed intake that is considered adequate to satisfy the requirements of the majority of the population.

In 1992 the Committee also suggested reference values for nutrition labelling purposes. Two sets of reference labelling values were included in the SCF Report[4]. One set was intended to apply to foods other than those intended for the particular nutritional use of infants and young children, which were in general based on the adult male AR. The other set was for use on foods intended for the particular nutritional use of infants and young children, based on PRIs of infants and young children of 6 months to 3 years of age. In order to avoid confusion with the recommended nutrient intakes (RDAs/PRIs), the Committee adopted the term "Reference Labelling Values (RLVs)" for reference values derived for use for nutrition labelling.

4. CONSIDERATIONS ON THE CHOICE OF REFERENCE LABELLING VALUES

Nutrition labelling is considered as one of the ways to inform the consumer about the nutritional value of certain foods so that they can choose foods or an overall diet that are appropriate to their individual needs. Generally, consumers use nutrition labelling for two purposes: information about the nutrient content of the food products to compare different products; and, information about the nutrient content of the food item to estimate its usefulness in the overall diet in terms of its percentage contribution to the recommended nutrient intakes in order to select a diet based on the individual preferences and nutritional needs. In addition, the nutrition labelling should support actions in the area of nutritional education targeted at the general public. Knowledge of the basic principles of nutrition and appropriate nutrition labelling contribute towards enabling consumers to make food choices appropriate to their individual needs. To benefit consumers and to avoid technical barriers to trade nutrition labelling should be presented in a standardised form throughout the European Union. To achieve this goal it is also important that a set of Reference Labelling Values (RLVs) for vitamins and minerals be available.

Two important issues are involved in the process of producing a coherent and simple list of RLVs, namely:

i. The basis of the reference labelling value; and,

ii. Whether different reference labelling values should be recommended for different groups of the population.

i. The basis of the reference labelling value (RLV)

If the consumer is using the nutrition labelling information to compare the nutrient content of different products the basis of the selection for the RLVs will not affect such comparisons. However, the basis becomes important for the expression of the vitamin/mineral content of a food as a percentage of a reference value.

Taking the other use of nutrition labelling into consideration, namely giving the consumer the possibility to select a diet to fulfil his/her individual needs, values of the recommended nutrient intakes (RDAs or PRIs) fulfil this ambition. If consumers were striving to reach 100% of the recommended nutrient intake based on the definition of the average requirement plus two SD, an adequate nutrient intake for the vast majority of the population would be ensured.

However, one can argue that the principle of RLVs being based on the recommended nutrient intakes (RDAs/PRIs) intended to cover the nutrient requirements of the majority of the population could lead to an upward trend in the level of vitamins and minerals in foods due to the expected demands of the consumer for higher levels of nutrients as well as manufacturers' efforts to enhance nutrient value. Therefore, in view of the potential use of nutrition labelling, it might be acceptable to use the Average Requirements (AR) as the RLV. In contrast to the use of the RDA/PRI as the reference labelling value reflecting the principle that most if not all individuals of a population would have an adequate vitamin and mineral intake, the average requirements could be the acceptable reference to provide information about the usefulness of the food items in relation to the overall diet since it reflects the average nutritional needs and not the extreme needs of a few in the population.

In 1992 the Committee elaborated on the arguments against the use of RDAs/PRIs as RLVs[4]. The arguments were that the RDA/PRI for adult men as general RLV would overestimate the actual need of most men since the RDA/PRI covers the need of 97.5% of the target group. It will certainly overestimate the needs of women and children. Therefore the use of the RDA/PRI for adult men for nutrition labelling could lead to a fall in confidence in some traditional foods by making them appear to be of low nutritional value. It was noted that in some cases nutritional information could not be given on the label, because nutrients would not be present in food in a significant amount as defined in the nutrition labelling Directive. Based on these arguments the Committee recommended in their opinion of 1992 to use the AR for adult males as the RLV. However an exception was made for iron, since the AR value for men of 7 mg/day would not be adequate for menstruating women. Therefore an additional value of 14 mg/day for women was proposed to be included in the RLVs. This average requirement approach created a set of RLVs that was different from the PRIs recommended by the SCF.

In Table 1 a comparison is given for the existing RLVs as given in the nutrition labelling Directive[8], the PRIs and the RLVs suggested by the SCF in its opinion of 1992[4].

From this table it becomes clear that the existing RLVs[8] are more in line with the PRIs compared to the RLVs suggested by the SCF, which are generally, but not consistently, based on the AR for males.

Table 1 Summary of the Reference Labelling Values (RLVs) as given in the nutrition labelling Directive, the SCF recommended PRI values (adult male/women) as well as the RLVs suggested by the SCF

	Existing RLVs (Nutrition Labelling Directive)[8]	PRI (SCF, 1992)[4]	RLVs (SCF, 1992)[4]
Vitamin B_1 (mg)	1.4	1.1/0.9	0.8
Vitamin B_2 (mg)	1.6	1.6/1.3	1.3
Niacin (mg)	18	18/14	15
Vitamin B_6 (mg)	2.0	1.5/1.1	1.3
Folic acid (µg)	200	200	140
Vitamin B_{12} (µg)	1.0	1.4	1.0
Vitamin C (mg)	60	45	30
Vitamin A (µg RE)	800	700/600	500
Vitamin D (µg)	5	0-10	5
Vitamin E (mg)	10	>4/>3	-
Pantothenic acid (mg)	6	3 - 12	-
Biotin (µg)	150	15 - 100	-
Calcium (mg)	800	700	550
Phosphorus (mg)	800	550	-
Iron (mg)	14	9/20	7/14
Zinc (mg)	15	9.5/7	7.5
Copper (mg)	-	1.1	0.8
Selenium (mg)	-	55	40
Iodine (µg)	150	130	100
Magnesium (mg)	300	150-500	-

Accepting the AR as the basis for labelling purposes leads to a list of substantially different (lower) values compared to the existing RLVs as well as to the existing National/European recommended nutrient intake values (RDAs/PRIs) in the different Member States. The Committee is of the opinion that the substantial differences in the RLVs, derived by taking the AR as the basic value, compared to the existing RLVs in the nutrition labelling Directive as well as the existing RDAs/PRIs would lead to more confusion instead of giving an uniform and simple system. Different reference lists with substantially different values could potentially lead to confusion for the consumers and could also lead to difficulties for organisations providing nutritional education, that would need to explain the different basis for the two types of reference values. An additional argument is the fact that both the existing RLVs in the nutrition labelling Directive and the daily values that are used in the USA for labelling purposes are derived from RDA values, that is "usual intake at or above this level has a low probability of inadequacy".

Therefore the Committee accepts the recommended nutrient intake principle, such as used for the RDAs and PRIs, as the basis for the list of RLVs.

ii. Whether different reference labelling values (RLVs) should be recommended for different groups of the population

The Committee recognises that the RLV is not intended for use by professionals for assessing the adequacy of the population diet or by those responsible for ensuring that specific groups

in the population (e.g. schoolchildren taking schoolmeals, etc.) receive an adequate nutrient supply. However, the selection of a value for nutrition labelling involves more than only scientific arguments. Arguments such as simplicity, and universal labelling for most if not all of the population is of importance in order to avoid confusion by the consumer. In fact this universal labelling argument is considered as an essential prerequisite for a successful application of nutrition labelling.

If only one value can be used for labelling purposes, which should be chosen?

It seems logical to select the RDAs/PRIs of the adult age group. With the selection of the recommended values for this age group the need of the vast majority of the population would be covered. The only cases where the RLV might be considered relatively high compared with the needs of the group would be the younger age groups below adolescent age and, perhaps, the elderly age groups. On the other hand, one can argue that especially in these age groups an upward trend in the nutrient content of foods due to the relatively high RLVs is from a nutritional point of view less of concern. These population groups in particular need extra attention related to the risks of sub optimal intakes of vitamins and minerals. However, to keep the nutrition labelling simple it is appropriate to have one value for nutrition labelling purposes.

The next question to address is whether one should select the RDA/PRI for males, females or a combination of both values

The Committee took the following arguments into consideration. The RDAs/PRIs values for men are more in line with the currently available RLVs (see Table 1). However, especially for the young and older age groups the levels are relatively high. The RDAs/PRIs for women are considerably lower, which makes them more suitable for the entire age range. However, the values are not in line with the existing list of RLVs. A weighted mean of the RDAs/PRIs values for both males and females would lead to a figure that is not significantly higher than the needs of certain population groups but would still be approaching the required intake of a nutrient that would satisfy the needs of the majority of the population. Therefore the Committee accepts the combination of the adult RDA/PRI value for men and women as basis for the RLV.

Special attention for very young children

The Committee would like to point out that the accepted uniform principle of taking the combined RDA/PRI for adult men and women presents a problem for products intended to satisfy the particular nutritional requirements of infants and very young children up to the age of 3 years. Since these foods are almost exclusively eaten by this age group, the Committee is proposing an additional set of RLVs which could serve for the nutrition labelling of foods intended for the particular nutritional use of infants and young children. Comparable to the standard labelling values these RLVs should be based on the RDAs/PRIs for children aged between 6 months and 4 years.

5. SELECTION OF A SUITABLE RDA/PRI LIST TO EXTRACT RLVs

The next and perhaps most important issue to be solved is on which RDA/PRI values this reference labelling list should be based. The Committee was asked to take into account scientific developments and relevant data from Member States and elsewhere on

recommended nutrient intakes for the population. The SCF opinion on nutrient and energy intakes for the European Community was based on the scientific literature prior to 1991[4]. Some of these values require revision due to the fact that science has progressed at least in some areas of the vitamin and mineral research such as in the case of folic acid and vitamin B_{12}.

Ideally a fully updated set of RDA/PRI values should be the basis for a reference labelling list. However such a task takes 2-3 years and with the current program and resources of the Committee it is not feasible to execute such a task in the near future. Also most Member States have put efforts in defining national RDA tables. In some countries this process of revising the national RDAs was finished recently such as the "Referenzwerte" from Germany, Austria and Switzerland (2000)[11], the "Voedingsnormen" in Belgium (2000)[9] and The Netherlands (2000/2003)[15,16] and the "Apports Nutritionnels Conseillés" in France (2001)[10]. Also the United States have revised their vitamin/mineral RDAs recently (1997-2001)[22-25].

The Committee has considered the possibilities for how to derive a RLV from the existing RDA/PRI lists knowing that there was no opportunity for a complete scientific review of the existing literature of each vitamin and mineral. Also the need for such a review of the scientific evidence is less of concern since the use of the list is for labelling instead of assessing the adequacy of the diet within a group of the population. Therefore the Committee came to the decision to evaluate the existing RDA lists in the Member States and elsewhere and their scientific basis to extract an overall RLV and to give in this evaluation process higher priority to the more recently published values. In this way the recent scientific developments and relevant data from Member States and elsewhere were included in the evaluation process.

In Table 2 a summary of RDAs lists for adults are given for most of the European countries as well as the PRIs (SCF, 1992) and RDAs from the US and FAO/WHO. If applicable these values are separated for males and females. Based on these values an overall RLV was extracted taking the values for both males and females equally into consideration. Furthermore the more recently published values were given more weight in the overall assessment due to the inclusion of more recent scientific literature.

Sodium is unusual in that it is among the nutrients included in the nutrition labelling Directive under "group 2" of nutrients namely: energy value, the amounts of protein, carbohydrate, sugars, fat, saturates, fibre and sodium. The nutrition labelling Directive states that where a nutrition claim is made for sodium the nutrition labelling information shall consist of the group 2 nutrients. However, sodium is a mineral and as such could be also declared in the list of vitamins and minerals. Therefore, it is appropriate to identify a RLV for sodium. The Committee is aware about the debate on whether the information to the consumer should be given in terms of sodium or salt. However, given the fact that sodium is already in the Directive, these values are given in the tables.

In Table 3 a summary of RDAs of vitamins and minerals for infants aged 6-12 months and children aged 1-3 years or 1-4 years are given for most of the European countries along with the 1992 PRIs and the recent RDAs from the US and FAO/WHO. It should be noted that the selected age range 1-4 years is variable in the different RDAs/PRIs. For instance, in the SCF PRI list, the age range is 1 to 3 years. Based on these values an overall RLV for the whole age range from 6 months to 4 years was extracted taking the overall values from the 1-3/4 year range as reference values. In this way an adequate RLV for the very young children could be derived.

Table 2 Comparison of recommended daily intakes (RDAs/PRIs) of vitamins and minerals for adults derived from different countries and organisations

Vitamins	B_1 Thiamine (mg)	B_2 Riboflavin (mg)	Niacin (mg)	B_6 (mg)	Folates (µg)	B_{12} (µg)	C (mg)	A (µg RE[#])	D (µg)	E (mg)	K (µg)	Pantothenic acid (mg)	Biotin (µg)
European Union (including Greece), 1992[4]	1.1/0.9	1.6/1.3	18/14	1.5/1.1	200	1.4	45	700/600	0-10	0.4[*]/ >4->3	-	3-12	15-100
Belgium, 2000[9]	1.1/0.9	1.6/1.3	18/14	1.7/1.2	200	1.4	70	700/600	2.5-10	10	-	3-12	15-100
France, 2001[10]	1.3/1.1	1.6/1.5	14/11	1.8/1.5	330/300	2.4	110	800/600	5	12	45	5	50
Germany, Austria, Switzerland, 2000[11]	1.2/1.0	1.4/1.2	16/13	1.5/1.2	400	3.0	100	1000/800	5	15/12	70/60	6	30-60
Ireland, 1999[12]	1.1/0.9	1.6/1.3	18/14	1.5/1.1	300	1.4	60	700/600	0-10	-	-	-	-
Italy, 1996[13]	1.2/0.9	1.6/1.3	18/14	1.5/1.1	200	2	60	700/600	0-10	>8	-	-	-
Netherlands, 1989, 2000, 2003[14,15,16]	1.1	1.5/1.1	17/13	1.5	300	2.8	70	1000/800	2.5-5	11.8/ 9.3	-	5	-
Nordic countries, 1996[17]	1.4/1.1	1.8/1.3	19/15	1.5/1.2	300	2.0	60	900/800	5	10/8	-	-	-
Portugal, 1982[18]	1.5/1.2	1.6/1.4	18/14	2.2	400	3.0	75	1000	-	-	-	-	-
Spain, 1994-1998[19]	1.2/0.9	1.8/1.4	20/15	1.8/1.6	200	2.0	60	750	2.5	12	-	-	-
United Kingdom, 1991[20]	1.0/0.8	1.3/1.1	17/13	1.4/1.2	200	1.5	40	700/600	-	>4/>3	74/60	3-7	10-200
United States, 1997, 1998, 2000, 2001[22,23,24,25]	1.2/1.1	1.3/1.1	16/14	1.3	400	2.4	90/75	900/700	5	15	120/ 90	5	30
FAO/WHO, 2002[26]	1.2/1.1	1.3/1.1	16/14	1.3	400	2.4	45	600/500	5	10/7.5	65/55	5	30
Reference Labelling Value (RLV)	**1.1**	**1.4**	**16**	**1.4**	**400**	**2.5**	**80**	**800**	**5**	**12**	**75**	**6**	**50**

When there are 2 values, the left-hand side value represents the contribution advised for men, that of right-hand side for women. When a range of values is proposed, it is indicated by sign "-".

[#] Retinol equivalents. [*] mg/g PUFA.

Minerals	Ca (mg)	P (mg)	K (mg)	Na (mg)	Cl (mg)	Fe (mg)	Zn (mg)	Cu (mg)	I (µg)	Se (µg)	Mg (mg)	Mn (mg)	Cr (µg)	Mo (µg)	F (mg)
European Union (including Greece), 1992[4]	700	550	3100	575-3500	match sodium	9/20	9.5/7	1.1	130	55	150-500	1-10	-	-	-
Belgium, 2000[9]	900	800	2000-4000	575-3500	750-4600	9/20	9.5/7	1.1	150	70	420/330	2-5	-	75-250	-
France, 2001[10]	900	750	-	-	-	9/16	12/10	2.0/1.5	150	60/50	420/360	-	65/55	30-50	2.5/2.0
Germany, Austria, Switzerland, 2000[11]	1000	700	2000	550	830	10/15	10.0/7.0	1.0-1.5	200	30-70	350/300	2.0-5.0	30-100	50-100	3.8/3.1
Ireland, 1999[12]	800	550	3100	-	-	10/14	9.5/7	1.1	130	55	-	-	-	-	-
Italy, 1996[13]	1000	1000	3100	-	-	10/18	10/7	1.2	150	55	-	-	-	-	-
Netherlands, 1989, 2000[14,15]	1000	700-1400	-	-	-	9/15	10/9	1.5-3.5	-	50-150	300-350/250-300	-	-	-	-
Nordic countries, 1996[17]	800	600	3500/3100	-	-	10/18	9/7	-	150	50/40	350/280	-	-	-	-
Portugal, 1982[18]	800	800	3750	2200	3400	15	11/15	2.5	150	-	350/300	3.8	-	-	2.7
Spain, 1994-1998[19]	600-850	-	-	-	-	10-15/18	15	-	140-145/110-115	-	350-400/330	-	-	-	-
United Kingdom, 1991[20]	700	550	3500	1600	2500	8.7/14.8	9.5/7.0	1.2	140	75/60	300/270	>1.4	>25	50-400	3.7/3.0
United States, 1997, 1998, 2000, 2001[22,23,24,25]	1000	700	2000	500	750	8/18	11/8	0.9	150	55	400-420/310-320	2.3/1.8	35/25	45	4/3
FAO/WHO, 2002[26]	1000	-	-	-	-	9/20	7.0/4.9	-	130/110	34/26	260/220	-	-	-	-
Reference Labelling Value (RLV)	**1000**	**700**	**2000**	**600**	**800**	**14**	**10**	**1.0**	**150**	**55**	**375**	**2.0**	**40**	**50**	**3.5**

Table 3 Comparison of recommended daily intakes (RDAs/PRIs) of vitamins and minerals for infants aged 6-12 months and children aged 1-3 years or 1-4 years derived from different countries and organisations

Vitamins	B_1 Thiamine (mg)		B_2 Riboflavin (mg)		Niacin (mg)		B_6 (mg)		Folates (µg)		B_{12} (µg)		C (mg)	
	6-12 m	1-3/4 y	6-12 m	1-3/4 y	6-12 m	1-3/4 y	6-12 m	1-3/4 y	6-12 m	1-3/4 y	6-12 m	1-3/4 y	6-12 m	1-3/4 y
European Union (including Greece), 1992[4]	0.3	0.5	0.4	0.8	5	9	0.4	0.7	50	100	0.5	0.7	20	25
Belgium, 2000[9]	0.3	0.5	0.4	0.8	5	9	0.4	0.7	50	100	0.5	0.7	35	40
France, 2001[10]	0.2	0.4	0.4	0.8	3	6	0.3	0.6	70	100	0.5	0.8	50	60
Germany, Austria, Switzerland, 2000[11]	0.4	0.6	0.4	0.7	5	7	0.3	0.4	80	200	0.8	1.0	55	60
Ireland, 1999[12]	0.2-0.3	0.5	0.4	0.8	4-5	9	0.3-0.4	0.7	50	100	0.4	0.7	25	45
Italy, 1996[13]	0.4	0.6	0.4	0.8	5	9	0.4	0.7	50	100	0.5	0.7	35	40
Netherlands, 2000, 2003[15,16]	0.2	0.3	0.4	0.5	2	4	0.3	0.4	60	90	0.6	0.8	35	40
Nordic countries, 1996[17]	0.4	0.7	0.5	0.8	6	9	0.5	0.8	50	75	0.6	1.0	35	40
Portugal, 1982[18]	0.5	0.5	0.6	0.8	8	8	0.6	0.9	45	100	1.5	2.0	35	35
Spain, 1994-1998[19]	0.3	0.4	0.6	0.8	6	8	-	-	60	100	0.3	0.9	50	55
United Kingdom, 1991[20]	0.2-0.3	0.5	0.4	0.6	4-5	8	0.3-0.4	0.7	50	70	0.4	0.5	25	30
United States, 1997, 1998, 2000, 2001[22,23,24,25]	0.3	0.5	0.4	0.5	4	6	0.3	0.5	80	150	0.5	0.9	50	15
FAO/WHO, 2002[26]	0.3	0.5	0.4	0.5	4	6	0.3	0.5	80	160	0.5	0.9	30	30
Overall values	**0.4**	**0.5**	**0.4**	**0.7**	**4**	**7**	**0.3**	**0.7**	**70**	**125**	**0.5**	**0.8**	**45**	**45**
Reference Labelling Value (RLV)	**0.5**		**0.7**		**7**		**0.7**		**125**		**0.8**		**45**	

Vitamins	A (µg RE)		D (µg)		E (mg TE)		K (µg)		Pantothenic acid (mg)		Biotin (µg)	
	6-12 m	1-3/4 y	6-12 m	1-3/4 y	6-12 m	1-3/4 y	6-12 m	1-3/4 y	6-12 m	1-3/4 y	6-12 m	1-3/4 y
European Union (including Greece), 1992[4]	350	400	10-25	10	0.4 mg/g PUFA		-	-	-	-	-	-
Belgium, 2000[9]	350	400	10-15	5-10	0.6-0.8 mg/g PUFA	0.6 mg/g PUFA	10	15	2-3	3-5	10-15	20-30
France, 2001[10]	350	400	20-25	10	4	6	5-10	15	2	2.5	6	12
Germany, Austria, Switzerland, 2000[11]	600	600	10	5	4	6/5	10	15	3	4	5-10	10-15
Ireland, 1999[12]	350	400	7	10	-	-	-	-	-	-	-	-
Italy, 1996[13]	350	400	10-25	10	-	-	-	-	-	-	-	-
Netherlands, 1989, 2000[14,15]	400	400	5-10	5-10	3.6	5.7	-	-	2	2	-	-
Nordic countries, 1996[17]	400	400	10	10	4	5	-	-	-	-	-	-
Portugal, 1982[18]	400	400	-	-	-	-	-	-	-	-	-	-
Spain, 1994-1998[19]	450	300	10.0	10.0	-	-	-	-	-	-	-	-
United Kingdom, 1991[20]	350	400	7	7	0.4 mg/g PUFA	-	10	-	1.7	-	10-200	10-200
United States, 1997, 1998, 2000, 2001[22,23,24,25]	500	300	5	5	5	6	2.5	30	1.8	2	6	8
FAO/WHO, 2002[26]	400	400	5	5	2.7	5	10	15	1.8	2	6	8
Overall values	**450**	**400**	**7**	**7**	**4**	**5**	**10**	**12**	**2**	**3**	**6**	**10**
Reference Labelling Value (RLV)	**400**		**7**		**5**		**12**		**3**		**10**	

Minerals	Ca (mg)		P (mg)		K (mg)		Na (mg)		Cl (mg)		Fe (mg)		Zn (mg)		Cu (mg)	
	6-12 m	1-3/4 y	6-12 m	1-3/4 y	6-12 m	1-3/4 y	6-12 m	1-3/4 y	6-12 m	1-3/4 y	6-12 m	1-3/4 y	6-12 m	1-3/4 y	6-12 m	1-3/4 y
European Union (including Greece), 1992[4]	400	400	300	300	800	800	-	-	-	-	6	4	4	4	0.3	0.4
Belgium, 2000[9]	600	800	500	700	293-780	800-1000	173-460	225-500	263-710	350-800	10	10	4	4	0.3-0.7	0.4-1
France, 2001[10]	-	500	-	360	-	-	-	-	-	-	-	7	-	6	-	0.8
Germany, Austria, Switzerland, 2000[11]	400	600	300	500	650	1000	180	300	270	450	8	8	2.0	3.0	0.6-0.7	0.5-1.0
Ireland, 1999[12]	525	800	-	300	700	800	320-350	-	500	-	7.8	8	5.0	4	0.3	0.4
Italy, 1996[13]	600	800	500	800	800	800	-	-	-	-	7	7	4	4	0.3	0.4
Netherlands, 1989, 2000[14,15]	450	500	400	400-800	-	-	-	-	-	-	7	7	4	4	0.3-0.5	0.3-0.7
Nordic countries, 1996[17]	540	600	420	470	800	800	-	-	-	-	8	8	5	5	-	-
Portugal, 1982[18]	650	800	360	800	850	1100	500	650	800	1000	7	7	5	10	0.8	1.2
Spain, 1994-1998[19]	600	650	-	-	-	-	-	-	-	-	7	7	5	10	-	-
United Kingdom, 1991[20]	525	350	400	270	700	800	320-350	500	500	800	7.8	6.9	5.0	5.0	0.3	0.4
United States, 1997, 1998, 2000, 2001[22,23,24,25]	270	500	275	460	700	1000-1400	200	225-300	300	350-500	11	7	3	3	0.22	0.34
FAO/WHO, 2002[26]	400	500	-	-	-	-	-	-	-	-	6	4	4.1	4.1	-	-
Overall values	**450**	**550**	**350**	**550**	**700**	**1000**	**300**	**400**	**400**	**500**	**8**	**8**	**4**	**5**	**0.4**	**0.5**
Reference Labelling Value (RLV)	**550**		**550**		**1000**		**400**		**500**		**8**		**5**		**0.5**	

Minerals	Se (µg)		I (µg)		Mg (mg)		Mn (mg)		Cr (µg)		Mo (µg)		F (mg)	
	6-12 m	1-3/4 y	6-12 m	1-3/4 y	6-12 m	1-3/4 y	6-12 m	1-3/4 y	6-12 m	1-3/4 y	6-12 m	1-3/4 y	6-12 m	1-3/4 y
European Union (including Greece), 1992[4]	8	10	50	70	80	85	1-10	1-10	-	-	-	-	-	-
Belgium, 2000[9]	15	20	90	90	60-80	80-85	0.6-1.0	1.0-1.5	-	-	21-40	25-50	-	-
France, 2001[10]	-	20	-	80	-	80	-	-	-	25	-	-	-	0.5
Germany, Austria, Switzerland, 2000[11]	7-30	10-40	80	100	60	80	0.6-1.0	1.0-1.5	20-40	20-60	20-40	25-50	0.5	0.7
Ireland, 1999[12]	10	10	60	70	75-80	-	-	-	-	-	-	-	-	-
Italy, 1996[13]	8	10	50	70	-	-	-	-	-	-	-	-	-	-
Netherlands, 1989[14]	10-20	10-30	-	-	35-60	60-70	-	-	-	-	-	-	-	-
Nordic countries, 1996[17]	15	20	50	70	80	85	-	-	-	-	-	-	-	-
Portugal, 1982[18]	-	-	50	70	70	150	0.8	1.2	-	-	-	-	0.8	1.2
Spain, 1994-1998[19]	-	-	45	55	85	125	-	-	-	-	-	-	-	-
United Kingdom, 1991[20]	10	15	60	70	75-80	85	>0.14	>0.2	-	1-13	4-15	6-19	1.1-1.2	1.5
United States, 1997, 1999, 2000, 2001[22,23,24,25]	20	20	130	90	75	80	0.6	1.2	5.5	11	3	17	0.5	0.7
FAO/WHO, 2002[26]	10	17	135	75	53	60	-	-	-	-	-	-	-	-
Overall values	**15**	**20**	**70**	**80**	**75**	**80**	**0.7**	**1.2**	**10**	**20**	**15**	**25**	**0.5**	**0.7**
Reference Labelling Value (RLV)	**20**		**80**		**80**		**1.2**		**20**		**25**		**0.7**	

6. DISCUSSION

The Committee was requested to take into account scientific developments and relevant data from Member States and elsewhere on the selection of a suitable RDA/PRI list. Tables 2 and 3 comprise all available Member States' RDA values as well as the EU, US and FAO/WHO recommended PRI/RDA values.

A comparison of these recommended intakes with the existing list of RLVs in the nutrition labelling Directive shows that the amounts for vitamin B_1, B_2, niacin, vitamins C, A, D, iron, iodine and manganese are similar or within the same range. New RLVs could be derived from the available RDA levels of EU Member States as well as the US for vitamin K, potassium, sodium, chloride, copper, selenium, manganese, chromium, molybdenum and fluoride.

Considerably lower RLVs compared to the existing labelling values were established for vitamin B_6, biotin and zinc. As stated in the introduction, the existing list of RLVs is based on RDA tables and scientific knowledge from before 1988 when the FAO/WHO expert consultation group established this reference list. For vitamin B_6 more recent scientific data justified a lower recommended nutrient intake as was illustrated in the reduction of the US RDA of 2.0 mg/day for men and 1.6 mg/day for women in 1989[21] to 1.3 mg/day for men and women in 1998[23]. For biotin and zinc no recommended intake was established in most countries before 1988. Therefore most probably a relative high value was set by the WHO/FAO expert committee in order to ensure adequate intake for a large segment of the population. With the published information over the last 15 years, more precise lower RDAs or PRIs could be established.

In contrast, for folates and calcium an upward trend in RDA values is observed over the last 15 years. For folates the RDA values have been increased considerably (25 to 100%) in recently established RDA lists such as for Germany/Austria/Switzerland, France, The Netherlands and the US. New scientific data on the bioavailability of food folates compared to synthetic folic acid as well as its role in the reduction of the risk of neural tube defects for women capable of becoming pregnant were sufficiently conclusive to increase the recommended value in all recently published RDA lists.

A less spectacular upward trend in RDA values is observed for calcium. In more recent RDA lists, the recommended value is elevated from 800 mg to 900 mg (Belgium, France) or 1000 mg (Germany/Austria/Switzerland, The Netherlands and the US) in the light of the available scientific data on the role of dietary calcium to achieve the potential peak bone mass and to prevent osteoporosis.

Finally for vitamin B_{12} the proposed RLV of 2.5 µg is considerably higher than the existing value in the nutrition labelling Directive of 1.0 µg. Although most of the more recent established RDA/PRI values for vitamin B_{12} are higher (France, 2001: 2.4; Germany/Austria/Switzerland, 2000: 3.0; The Netherlands, 2003: 2.8; and the US, 1998: 2.4 µg/day) compared to the more dated values (European Union, 1992: 1.4; UK, 1991: 1.5 µg/day), this is not consistent for all RDA/PRI values as tabulated in Table 2 (such as Belgium, 2000: 1.4; Ireland, 1999: 1.4; Portugal, 1982: 3.0 µg/day). However, the existing RLV of 1.0 µg/day is below all existing available RDA/PRI values for vitamin B_{12} in the different countries (1.4 to 3.0 µg/day). The proposed RLV of 2.5 µg/day is in line with the more recently established RDA values and therefore based on the present scientific knowledge.

In 1992 the Committee proposed a separate list of RLVs for products intended solely for infants and young children. These RLVs were included in an amendment (Directive 96/4/EC)[6] to the Directive on infant formulae and follow-on formulae (Directive 91/321/EEC)[5]. Comparison of the new proposed RLVs, as given in Tables 2 and 3, with the existing list of RLVs do not show great differences. For thiamine, vitamin B_6 and vitamin A the values are similar. For riboflavin, niacin, vitamin B_{12}, vitamin D, iron, iodine, zinc and copper the new proposed RLVs are somewhat higher or lower than the existing RLVs.

Proposed RLVs for folates and calcium are higher based on the new scientific data on adequate levels of intake. Also for vitamin C and selenium the proposed levels are higher compared to the existing RLVs, which were set on the lower side of the range of RDAs from the different countries.

New RLVs could be derived for vitamin E, vitamin K, pantothenic acid, biotin, phosphorus, potassium, sodium, chloride, magnesium, manganese, chromium, molybdenum and fluoride. With this complete list of vitamins and minerals adequate reference values can be set for labelling purposes for products intended to fulfil particular nutritional needs of infants and young children up to 3 years of age.

7. REFERENCES

1. FAO/WHO/Ministry of Trade and Industry, Finland (1988). Recommended nutrient reference values for food labeling purposes. Report of a Joint FAO/WHO Expert Consultation on recommended allowances of nutrients for food labeling purposes. Helsinki, Finland, 12-16 September 1988.

2. Codex guidelines on nutrition labeling CAC/GL 2-1985 (Rev. 1 - 1993). http://www.fao.org/docrep/005/y2770e/y2770e06.htm

3. Commission of the European Communities. White Paper on Food Safety. COM (1999) 719 final. http://europa.eu.int/eur-lex/en/com/wpr/1999/com1999_0719en01.pdf

4. SCF (Scientific Committee for Food) (1992). Nutrient and energy intakes for the European Community. Opinion adopted by the Scientific Committee on Food on 12 December 1992. Reports of the Scientific Committee for Food, Thirsty-First Series. European Commission, Luxembourg, 1993. http://europa.eu.int/comm/food/fs/sc/scf/out89.pdf

5. Commission Directive 91/321/EEC of 14 May 1991 on infant formula and follow-on formulae. Official Journal of the European Communities L 175, 04.07.1991 p 35.

6. Commission Directive 96/4/EC of 16 February 1996 amending Directive 91/321/EEC on infant formula and follow-on formulae. Official Journal of the European Communities L 49, 28.02.1996, p 12.

7. Commission Directive 96/5/EC of 16 February 1996 on processed cereal-based foods and baby foods for infants and young children. Official Journal of the European Communities L 49, 28.02.1996, p 17.

8. Council Directive 90/496/EEC of 24 September 1990 on nutrition labelling for foodstuffs. Official Journal of the European Communities L 276, 06.10.1990, p 40.

9. CSH (Conseil Supérieur d'Hygiène) (2000). Recommandations Nutritionnelles en Belgique - Révision 2000.

10. AFSSA (Agencie Francaise de Sécurité Sanitaire des Aliments) (2001). Apport nutritionnels conseillés pour la population Française. Paris, Lavoisier Tec et Doc.

11. D-A-CH Referenzwerte (2000). Deutsche Gesellschaft für Ernährung, Österreichische Gesellschaft für Ernährung, Schweizerische Gesellschaft für Ernährungsforschung, Schweizerische Vereinigung für Ernährung: Referenzwerte für die Nährstoffzufuhr, Umschau/Braus Verlag, Frankfurt.

12. FSAI (Food Safety Authority of Ireland) (1999). Recommended Dietary Allowances for Ireland. Dublin. (www.fsai.ie).

13. Società Italianna di Nutrizione Umana. Livelli di assunzione raccomandati di energia e nutrienti per la poplazione Italiani (LARN). Revisione 1996. Milano, EDRA srl, 1998.

14. Voedingsraad (Nutrition Council of the Netherlands) (1989). Nederlandse Voedingsnormen (Dietary Reference Intakes). Den Haag, voorlichtingsbureau voor de Voeding, 1992.

15. Gezondheidsraad (Health Council of the Netherlands) (2000). Dietary Reference Intake for calcium, vitamin D, thiamin, riboflavin, niacin, pantothenic acid and biotin. Den Haag. Nr 2000/12.

16. Gezondheidsraad (Health Council of the Netherlands) (2003). Dietary Reference Intake for folic acid, vitamin B_6 and vitamin B_{12}. Den Haag. Nr 2003/4.

17. Nordisk Ministerråd, Nordisk Forlagshus. Nordiska Näringsrekommendationer 1996. Nord 1996: 28. (information included in the table is from the summary Nordic Nutrition Recommendations, Scandinavian Journal of Nutrition 1996, vol 40: 161-165).

18. Portugal - Recommended Dietary Allowances (Revised 1982). Nutrition Research Centre, National Institute of Health.

19. Spain - Based on "Ingesta Recommendada de Nutrientes (I.R.) ó R.D.A. para la Población Española". Information de la Sociedad Española de Dietética y Ciencias de la Alimentación (SEDCA). (www.nutricion.org).

20. COMA (Committee on Medical Aspects of Food Policy) (1991). Department of Health. Dietary Reference Values for Food Energy and Nutrients for the United Kingdom. Report of the Panel on Dietary Reference Values of the Committee on Medical Aspects of Food Policy. London: HMSO. (Report on Health and Social Subjects; 41).

21. FNB (Food and Nutrition Board) (1989). Recommended Dietary Allowances. 10th Edition. Institute of Medicine, National Academy Press, Washington, D.C.

22. FNB (Food and Nutrition Board) (1997). Dietary Reference Intakes for Calcium, Phosphorus, Magnesium, Vitamin D and Fluoride. Institute of Medicine, National Academy Press, Washington, D.C.

23. FNB (Food and Nutrition Board) (1998). Dietary Reference Intakes for Thiamin, Riboflavin, Niacin, Vitamin B6, Folate, Vitamin B12, Pantothenic Acid, Biotin, and Choline. Institute of Medicine, National Academy Press, Washington, D.C.

24. FNB (Food and Nutrition Board) (2000). Dietary Reference Intakes for Vitamin C, Vitamin E, Selenium and Carotenoids. Institute of Medicine, National Academy Press, Washington, D.C.

25. FNB (Food and Nutrition Board) (2001). Dietary Reference Intakes for Vitamin A, Vitamin K, Arsenic, Boron, Chromium, Copper, Iodine, Iron, Manganese, Molybdenum, Nickel, Silicon, Vanadium, and Zinc. Institute of Medicine, National Academy Press, Washington, D.C.

26. WHO/FAO (World Health Organization and Food and Agriculture Organization of the United Nations) (2002). Human vitamin and mineral requirements. Report of a Joint FAO/WHO Expert Consultation, Bangkok, Thailand. FAO Rome. http://www.fao.org/docrep/004/y2809e/y2809e00.htm