alliance for natural health
Good science and good law

Consultation response to the European Commission Discussion Paper on the setting of maximum and minimum amounts for vitamins and minerals in foodstuffs

29 September 2006

INTRODUCTORY REMARKS

About the Alliance for Natural Health

The Alliance for Natural Health (ANH) is an UK-based, EU-focused, lego-scientific, non-governmental organisation that is working on behalf of medical doctors, complementary health practitioners, consumers and food manufacturers and distributors, to protect and promote natural healthcare, using the principles of good science and good law.

The ANH's principal objective is to help develop an appropriate legal and scientific setting for the development of sustainable approaches to healthcare. Within this setting, consumers and health professionals should be able to make informed choices about a wide range of health options, and in particular those that relate to diet, lifestyle and non-drug-based or natural therapies.

The ANH was formed in 2002, triggered by concerns that the EU Food Supplements Directive, which proclaimed its intention to allow "only vitamins and minerals normally found in, and consumed as part of, the diet" in food supplements (Recital 9), actually did not cater sufficiently for food-forms of vitamins and minerals. In fact, many of these nutrients forms were at risk of being banned by the Directive, given the perceived prohibitive costs of filing dossiers under the temporary derogation system (Article 4(6)). The ANH has subsequently proceeded with a judicial review of aspects of the Directive which was successfully referred by the High Court in London to the European Court of Justice (ECJ) in 2004. Following the opinion of the Advocate General on 5 April 2005, the ruling was handed down by the ECJ on 12 July 2005. The case will be concluded in the High Court in London in 2007, the purpose being to review the English Statutory Instrument and its compliance following the clarification and narrowing of scope made by the ECJ.

Background to the Consultation

The European Commission (EC) Discussion Paper to which this consultation response has been prepared is accessible from the following link:
http://ec.europa.eu/food/food/labellingnutrition/supplements/discus_paper_amount_vitamins.pdf#search=%22European%20Commission%20consultation%20on%20maximum%20permitted%20levels%20vitamins%20and%20minerals%22.

A range of justifications have been given for the initiative to set legally enforceable maximum and minimum amounts of vitamins and minerals across the European market. These include:

1. The need to ensure consumers are able to meet dietary requirements of vitamins and minerals, given that widespread deficiencies in certain vitamins and minerals have been found in a range of EU member states

2. To provide consumers with the ability exercise freedom of choice in selecting foods and food supplements so they can manage their own vitamin and mineral intakes depending on circumstances, individual needs, varying dietary patterns, etc.

3. Concerns that consumers might consume excessive quantities of vitamins and minerals and expose themselves to avoidable health risks

Alliance for Natural Health
The Atrium, Curtis Road, Dorking, Surrey RH4 1XA, United Kingdom
e-mail: info@anhcampaign.org tel: +44 (0)1252 371275
www.anhcampaign.org

4. The need to harmonise existing divergent maximum and minimum levels across the European market in the interests of free circulation of goods

In the interests of trade harmonisation, it may be convenient to set relatively restrictive maximum and minimum amounts in foods and food supplements. Each proposed value needs substantial scientific support, directly relevant to humans, to avoid unnecessary restriction of intakes (with potential adverse health consequences) as well as disproportionate impacts on consumer freedom of choice and food business operators. It is essential that it is conclusively demonstrated that the proposed maximum levels are not beneath those known to be optimal for significant numbers of individuals. It is highly inappropriate from a public health viewpoint to provide restrictions on consumer freedom of choice, which could potentially reduce consumers' ability to optimise their nutrient intakes. Such consumer freedom is necessary and has distinct public health advantages given the diversity of nutritional intakes, individual requirements and lifestyles found across the EU.

Furthermore, the setting of maximum and minimum amounts should be motivated by scientific evidence rather than trade requirements, given that the existing divergence in maximum amounts between different EU Member States has been generated more as a result of political, rather than scientific, concerns. Accordingly, it can only be justifiable to set such levels for given vitamins and minerals where there are adequate and conclusive scientific data relevant to humans.

Finally, there are considerable differences between the issues facing the determination of maximum and minimum amounts as they relate to general foodstuffs, as compared with food supplements. In the case of food supplements, the consumer purchases the product for the specific purpose of increasing intakes of a stated and known range of nutrients and the vast majority of food supplements are consumed on a single occasion daily. In contrast, foods are consumed as a basic human requirement, usually on several occasions each day, and, in most cases, the micronutrient content is of secondary interest to the consumer. Processed or manufactured foods which are subject to fortification are primarily consumed to satiate requirements for macronutrients, namely carbohydrates, proteins and lipids. Also, in some countries, such as the UK, it has been demonstrated that fortified foods make a relatively small contribution to overall vitamin and mineral intakes. Therefore, it is not appropriate to use identical processes for the determination of maximum and minimum amounts in both fortified foods and food supplements.

Risk assessment methodologies

The Alliance for Natural Health (ANH) first critiqued risk assessment methods in 2002, in its consultation response to the UK Food Standards Agency regarding the report of the Expert Group on Vitamins and Minerals (EVM).[1]

The ANH, by means of extensive reference to peer reviewed journals, reports and other relevant data, demonstrated a number of major problems associated with the risk assessment approach adopted by the EVM, including:

- Omission of relevant published studies (absent data)
- Lack of reference to adverse event data
- Inadequate consultation with experts in nutritional medicine
- Inappropriate interpretation of some animal studies; in many cases the applicability of animal studies to human studies (which are sparse) is unknown
- Ignoring the effects of combinations of nutrients (including vitamin complexes e.g. carotenoids, vitamin E)
- Inadequate consideration of variations in susceptibility across different population sub-groups
- Ignoring the effects of declining nutritional quality of diets

[1] The ANH's consultation response regarding the Draft Report of the Expert Group on Vitamins and Minerals (2002) can be downloaded from:
http://www.alliance-natural-health.org/_docs/ANHwebsiteDoc_11.pdf

- Avoiding the consideration of the effects of increased exposure to environmental toxins which should be counteracted by increased antioxidant/nutrient intakes

Then, in 2004, the ANH made an extensive submission (one of 16) to the FAO/WHO nutrient risk assessment project and critiqued the range of methodologies used to derive Upper Safe Levels (USLs).[2]

Among the ANH's findings, again supported by extensive reference to the literature, were:

- The conduct of risk assessment, in isolation from potential health benefits, delivers results that are erroneous for significant numbers of nutrient forms. (It would be irrational to *not* take into account a recent EFSA initiative[3] and *not* await the development of a viable risk/benefit model, prior to enforcing maximum levels)
- The tendency for risk assessments to be undertaken on 'nutrient groups', rather than discrete 'nutrient forms', despite considerable variation in biological response between nutrients within given groups. This 'group' rather than 'form' approach is in direct contradiction to the principles of biochemistry and pharmacology, and contrasts with risk assessments in other areas (e.g. pesticides, other environmental chemicals)
- The process of extreme risk minimisation used in risk assessments of nutrients (which arbitrarily aims to ensure that >95% of the population is not exposed to risk), although thoroughly rational for risk assessment of toxins which have no known health benefits, conflicts with the public health interest of ensuring there is sufficient freedom of consumer choice to allow consumers to make informed decisions about their own diets. Risk/benefit assessment[3] would therefore be a preferred technique.
- Lack of consideration of adverse event reports or absence of adverse event data in the face of evidence of widespread, long-term, high dose usage
- There is no system for prioritising risk assessments for those nutrients or nutrient forms which present the greatest risk to the public when consumed in excessive amounts
- Risk (and benefit) assessment must be conducted using the totality of evidence, which, especially in cases where published research or dose-response data are lacking or inadequate, includes medical records (such as those obtained by clinical nutritionists[4])
- Peer-reviewed evidence is often omitted.

Some of these problems are well exemplified in the abstract of a paper by Dr Reinhold Vieth, an internationally recognised authority on the safety and use of vitamin D:

> "The tolerable upper intake level (UL) for vitamin D is 50 mcg/d (2000 iu/d) in North America and in Europe. In the United Kingdom a guidance level exists for vitamin D, 25 mcg/d (1000 iu/d), defined as the dose "of vitamins and minerals that potentially susceptible individuals could take daily on a life-long basis, without medical supervision in reasonable safety." **Exposure of skin to sunshine can safely provide an adult with vitamin D in an amount equivalent to an oral dose of 250 mcg/d.** *[bold added for emphasis]* The incremental consumption of 1 mcg/d of vitamin D3 raises serum 25-hydroxyvitamin D [25(OH)D] by approximately 1 nmol/L (0.4 microg/L). Published reports suggest toxicity may occur with 25(OH)D concentrations beyond 500 nmol/L (200 microg/L)."[5]

[2] The ANH submission to the FAO/WO nutrient risk assessment project can be downloaded from: *http://www.alliance-natural-health.org/_docs/ANHwebsiteDoc_121.pdf*

[3] The European Food Safety Authority (EFSA) has recognised the need for risk/benefit assessment and has conducted a colloquium (in which Dr Robert Verkerk of the ANH participated) on this subject in July 2006, viz: EFSA Colloquium 6, *Risk-benefit analysis of foods: methods and approaches*, held in Tabiano, northern Italy, 13-14 July 2006. Proceedings due to be published in March 2007. Further information: *http://www.efsa.europa.eu/en/science/colloquium_series/risk_benefit_analys.html*.

[4] For example, just one single London-based clinic, the Biolab Medical Unit (*www.biolab.co.uk*), has records on nutrient intake and response from 240,000 patients, developed over a period of some 22 years.

[5] Vieth R. Critique of the considerations for establishing the tolerable upper intake level for vitamin D: critical need for revision upwards. *J Nutr.*, 2006;136(4): 1117-22.

Risk management

Article 5 of the Food Supplements Directive (Directive 2002/46/EC) and Article 6 of the proposed 'Regulation on the addition of vitamins and minerals and of certain other substances to foods' contain criteria that are supposed to be considered when setting maximum and minimum amounts of vitamins and minerals. These provisions are designed to offer the necessary parameters for a risk management tool, with the principal aim of consumer protection, and a secondary aim of trade harmonisation across the European market.

However, there are various ways in which these parameters and guidelines can be interpreted or used, hence the considerable variation in approaches between the Danish Institute of Food and Veterinary Research, the French Agency of food safety (AFSSA) and the International Institute for Life Sciences (ILSO), which relate only to food fortification, and the BfR and two European food associations (ERNA and EHPM), where the models have been applied (variously) to food supplements and fortified foods.

Although the intention of the EC is to consider some of these existing models in conjunction with information received by way of the present consultation process with a view to developing an 'harmonised model', it is apparent that, given some of the deficiencies in the risk assessment approach (see above), the USL starting points for the risk management model will be too low for some nutrient forms (e.g. 'stomach-friendly'/buffered vitamin C forms, vitamin D3, iron bisglycinate, mixed carotenoid complexes, etc.) and excessively precautionary assumptions, particularly in the case of the BfR approach, leads to unjustifiably low daily maximum levels in many cases.

Moreover, there is nowhere an adequate scientific justification for the assumption that the risk assessment approaches that have now been assumed to be compatible with the legal requirement, as set by the ECJ,[6] which requires that restrictive measures are taken "only on the basis of a full assessment of the risk posed to public health by the substance, established on the basis of the most reliable scientific data available and the most recent results of international research" are appropriate methodologies in this context.

The rationality (or otherwise) behind the enforcement of maximum levels

There is no evidence that the restriction of the amount of a substance known to have toxic properties will cause people to avoid exposure to excessive doses where there is a specific intention of 'overdosing'. This is demonstrated by the high rates of adverse effects experienced in most western countries following deliberate consumption of products as diverse as analgesics, alcohol and even pesticides. It follows that the primary purpose of establishing upper levels is provide a risk management tool which aims to reduce the risk of consumers inadvertently consuming excessive dosages following the "normal use" of the fortified food or food supplement, that could be harmful either in the short or long term.

It should be recognised that there is a long history of safe use of food supplements in Europe, the United States of America and numerous other countries, and there is very little evidence that excessive dosages causes significant adverse health effects. Actually, despite ready consumer access to food supplements, a significant sector of the population, at least in some countries[7], appear to remain deficient in some nutrients. Also, vitamins and mineral levels regarded by most governments as adequate today, increasingly appear to be insufficient in the case of specific vitamins and minerals (e.g. vitamin C, D3, magnesium, etc.). This point has been previously made in the Common Position of the proposed regulation of the European Parliament and of the Council on the addition of vitamins and minerals and of certain other substances to foods: "progress in

[6] Paragraph 73 of joined ECJ cases C-154/04 (ANH) and C-155/04, 12 July 2005.

[7] The National Diet and Nutrition Survey: Adults aged 19-64 years, Vol 3, 2003) by the UK Food Standards Agency shows total intakes from foods and food supplements does not prevent common deficiencies in a range of nutrients, including iron, calcium and magnesium (*http://www.food.gov.uk/science/101717/ndnsdocuments/ndnsv303*).

scientific knowledge indicates that intakes of some nutrients for maintaining optimal health and well-being could be higher than those currently recommended."[8]

If the same logic being contemplated in relation to the placing of a ban on vitamin and mineral dosages which could constitute a potential human health risk were applied to other food-related areas, bans on many common foodstuffs would need to occur, including for dairy (e.g. lactase deficiency and cow's milk allergy), wheat (e.g. gluten intolerance) and peanuts (aflatoxin risk, peanut allergy). Additionally, in keeping with the proposed EC rationale, there would have to be restrictions on the consumption of non-fortified, natural foods, as over-consumption of these foods could contribute to intakes of micronutrients (as well as macronutrients) regarded as excessive following some determinations. For example, consumption of one 'meal of carrots', recommended as a means of improving the health of children in Guatemala, was found to provide up to 97 mg (minimum of 12.4 mg) of beta-carotene, which is over 24 times greater than the 4 mg maximum supplementary level recommended by the German Bundesinstitut für Risikobewertung (BfR) and nearly 14 times greater than the USL given by the EVM for non-smokers.[9] These anomalies clearly relate to the different forms in which beta-carotene may be present, as well as to misinterpretation of studies on the risks associated with consumption of synthetic beta-carotene, as compared with natural carotenoid complexes.

How good are the existing models?

Any risk model can only be regarded as viable if, following validation tests, the model produces data outputs that can be supported by scientific evidence. In the case of both the risk assessment models proposed for determination of USLs, as well as the procedure indicated for setting of Maximum Permitted Levels (MPLs) (as given in Article 5 of the Food Supplements Directive and Article 6 of the proposed Regulation on the addition of nutrients to foods), the models appear to produce data that are inconsistent with the overall body of scientific and medical evidence on nutrient safety.

As demonstrated in the ANH submission on the draft EVM report[1], the USLs are erroneous in relation to at least:

- Vitamin B6
- Beta-carotene
- Vitamin C
- Vitamin D

[8] Common Position on proposed regulation of the European Parliament and of the Council on the addition of vitamins and minerals and of certain other substances to foods, dated 4 November 2005, viz: *http://register.consilium.europa.eu/pdf/en/05/st09/st09857.en05.pdf*.

[9] Bulux J, Quan de Serrano J, Perez R, Rivera C, Solomons NW. The plasma beta-carotene response to a single meal of carrots in Guatemalan schoolchildren. *Int J Food Sci Nutr,* 1998; 49(3): 173-9.

Furthermore, the MPLs for these vitamins, but also for a much wider range of vitamin and mineral *forms*, are likely also to be under-stated, in some cases, dramatically. By way of limited examples, taking into account the most thorough determination of MPLs yet to be undertaken using an interpretation of the EC prescribed methodologies, as undertaken by the BfR, the following MPLs cannot be justified for the given nutrient forms:

Vitamin/mineral form	BfR MPL (nutrient group)	Selection of evidence used to justify the inappropriate MPL for given nutrient form
Vitamin D3	5 mcg (vitamin D)	Veith (2006)[10]; Bernardi *et al* (2002)[11]
Mixed, natural carotenoid complex	4 mg (beta-carotene)	Bulux *et al* 1998[12]; Nishino *et al* (2005)[13]; Tang *et al* 2005[14]; Zhao *et al* (2006)[15]
Vitamin B6 (pyridoxine)	5.4 mg (vitamin B6)	Pietz *et al* (1993)[16]; Vaasdev *et al* (1999)[17]
Methylcobalamin	9 mcg (vitamin B12)	Freeman 1996[18]; Andersson & Shapira 1998[19]

[10] Vieth R. What is the optimal vitamin D status for health? *Progress in Biophysics and Molecular Biology*, 2006; 92(1):26-32. Review.

[11] Bernardi RJ, Johnson CS, Modzelewski RA, Trump DL. Antiproliferative Effects of 1{alpha},25-Dihydroxyvitamin D3 and Vitamin D Analogs on Tumor-Derived Endothelial Cells. *Endocrinology*. 2002; 143(7) 2508-2514.

[12] Bulux J, Quan de Serrano J, Perez R, Rivera C, Solomons NW. The plasma beta-carotene response to a single meal of carrots in Guatemalan schoolchildren. *Int J Food Sci Nutr,* 1998; 49(3): 173-9.

[13] Nishino H, Murakoshi M, Mou XY, Wada S, Masuda M, Ohsaka Y, Satomi Y, Jinno K. Cancer prevention by phytochemicals. *Oncology*, 2005; 69 Suppl 1: 38-40.

[14]Tang G, Qin J, Dolnikowski GG, Russell RM, Grusak MA. Spinach or carrots can supply significant amounts of vitamin A as assessed by feeding with intrinsically deuterated vegetables. *Am J Clin Nutr*, 2005; 82(4): 821-8.

[15] Zhao X, Aldini G, Johnson EJ, Rasmussen H, Kraemer K, Woolf H, Musaeus N, Krinsky NI, Russell RM, Yeum KJ. Modification of lymphocyte DNA damage by carotenoid supplementation in postmenopausal women. *American Journal of Clinical Nutrition*, 2006; 83(1): 163-9.

[16] Pietz J, Benninger C, Schafer H, Sontheimer D, Mittermaier G, Rating D. Treatment of infantile spasms with high-dosage vitamin B6. *Epilepsia*, 1993; 34(4): 757-63.

[17] Vaasdev S, Ford CA, Parai S, Longerich L, Gadag V. Dietary vitamin B6 supplementation attenuates hypertension in spontaneously hypertensive rats. *Molecular and Cellular Biochemistry.* 1999; 200(1-2): 155-162(8).

[18] Freeman AG. Hydroxocobalamin versus cyanocobalamin. *Journal of the Royal Society of Medicine.* 1996; 89 (11): 659.

[19] Andersson HC, Shapira E. Biochemical and clinical response to hydroxocobalamin versus cyanocobalamin treatment in patients with methylmalonic acidemia and homocystinuria (cblC). *Journal of Pediatrics*, 1998; 132 (1): 121-124.

Gamma-tocopherol	15 mg (vitamin E)	Stone & Papas (1997)[20]; Pryor (2000)[21]; Yu *et al* (2005)[22]
Ester-C	225 mg (vitamin C)	Gruenwald *et al* (2006)[23]; Bush & Verlanqieri (1987)[24]
Iron bisglycinate	15 mg (iron)	Szarfarc *et al* (2001)[25]; Bovell-Benjamin *et al* (2000)[26]; Jeppsen & Borzelleca 1999[27]
Magnesium pidolate	400 mg (magnesium)	Paolisso *et al* 1992[28]; McGuire *et al* 2000[29]

[20] Stone WL, Papas AM. Tocopherols and the etiology of colon cancer. *Journal of the National Cancer Institute*, 1997; 89: 1006-1014. Review.

[21] Pryor WA. Vitamin E and heart disease: basic science to clinical intervention trials. *Free Radical Biology & Medicine*, 2000; 1;28(1):141-64. Review.

[22] Yu FL, Gapor A, Bender W. Evidence for the preventive effect of the polyunsaturated phytol side chain in tocotrienols on 17 beta-estradiol epoxidation. *Cancer Detect Prev,* 2005;29(4): 383-8

[23] Gruenwald J, Graubaum HJ, Busch R, Bentley C. Safety and tolerance of Ester-C compared with regular ascorbic acid. *Advances in Therapy*, 2006; 23(1): 171-8.

[24] Bush MJ, Verlanqieri AJ. An acute study on the relative gastro-intestinal absorption of a novel form of calcium ascorbate. *Research Communications in Chemical Pathology and Pharmacology.* 1987; 57(1): 137-40.

[25] Szarfarc SC, de Cassana LM, Fujimori E, Guerra-Shinohara EM, de Oliveira IM. Relative effectiveness of iron bis-glycinate chelate (Ferrochel) and ferrous sulphate in the control of iron deficiency in pregnant women. *Archivos Latinoamericanos de Nutricion,* 2001; 51(1 Suppl 1): 42-7.

[26] Bovell-Benjamin AC, Viteri FE, Allen LH. Iron absorption from ferrous bisglycinate and ferric trisglycinate in whole maize is regulated by iron status. *American Journal of Clinical Nutrition*, 2000; 71(6): 1563-9.

[27] Jeppsen RB, Borzelleca JF. Safety evaluation of ferrous bisglycinate chelate. *Journal of Food Chemistry and Toxicology.*, 1999; 37(7): 723-31.

[28] Paolisso G, Sgambato S, Gambardella A, Pizza G, Tesauro P, Varricchio M, D'Onofrio F. Daily magnesium supplements improve glucose handling in elderly subjects. *American Journal of Nutrition*, 1992; 55: 1161-1167.

[29] McGuire JK, Kulkarni MS, Baden HP. Fatal hypermagnesemia in a child treated with megavitamin/megamineral therapy. *Pediatrics*, 2000: 105 (2): art e.

CONSULTATION QUESTIONS

Following are the ANH's answers to the specific questions raised in the EC's Discussion Document.

SETTING OF MAXIMUM AMOUNTS

Establishment of maximum amounts for food supplements and other foods

- **EC QUESTION 1**
  Where there is not yet a scientifically established numerical tolerable upper intake levels for several nutrients, what should be the upper safe levels for those nutrients that should be taken into account in setting their maximum levels?

ANH ANSWER: Given that Article 5 of the Food Supplements Directive requires that maximum levels are set "taking into account" upper safe levels among other factors, there *can be no legal justification* for the setting of maximum levels in cases where upper levels have not yet been established.

Tolerable intake levels have generally not been set for vitamins and minerals over which there have been no significant health concerns, even in cases of very high intakes from combined sources (foods, fortified foods and food supplements). Accordingly, any attempt to impose legal restrictions on maximum levels of such nutrients would likely be motivated solely by an interest in achieving free movement of food supplements across the European market, and would not serve the primary purpose of the restriction, namely consumer protection. It could thus be seen as a disproportionate measure.

Where new data become available which allow upper levels to be established, maximum levels could then be established in accordance with an on-going, open review process. There needs to be a defined mechanism for the rapid update and re-implementation in modified form of any recommendations if maximum levels are shown by accruing data less than those required for optimal health in a significant sector of the population.

Vitamins and minerals for which there is no evidence of adverse effect within the intake levels known to occur (all sources) include: vitamin B1, vitamin B2, biotin, vitamin B12, vitamin K (phytonadione), pantothenic acid and chromium (polynicotinate). Other nutrient forms, but not necessarily nutrient groups, could be included in this list, including, for example, niacin/niacinamide, vitamin D3 and buffered vitamin C.

- **EC QUESTION 2**
  For some vitamins and minerals the risk of adverse effects, even at high levels of intakes, appears to be extremely low or non-existent according to available data. Is there any reason to set maximum levels for these vitamins and minerals?

ANH ANSWER: The setting of maximum levels cannot be justified where risks are extremely low or non-existent (according to available data), as this is fundamentally a risk management measure. If the risk is low or non-existent, it follows that there is no significant risk to manage, so any measure designed to lower intakes further would be disproportionate.

The legal measure should be constructed in a proportionate manner to the known risk, necessitating a tiered/prioritised approach to risk management (one example is given in the proposed ERNA/EHPM model, but this could be refined further to take into account variations between different nutrient forms).

Again, measures could be implemented at short notice should new data become available which suggests a negative change to a given nutrient's safety profile.

- **EC QUESTION 3: Where we set maximum levels, do we inevitably also have to set maximum amounts for vitamins and minerals separately for food supplements and fortified foods in order to safeguard both a high level of public health protection and the legitimate expectations of the various food business operators? Are there alternatives?**

ANH ANSWER: Given that the safety of a given substance is dose-related, there is no scientific rationale in applying the same maximum levels for food supplements as fortified foods, as the net intake will vary from person to person, depending on the relative consumption rate of each group. Therefore, it would be necessary to set MPLs separately for food supplements and fortified foods. Food supplement labels include specification of recommendations for daily dose, so the consumer tends to be considerably more aware of the daily dose taken in the supplement. In the case of fortified foods, although nutrient contents will be specified, there is no label indication as to the total amount of the food that can be consumed daily, and in some cases several portions, and different amounts, will be consumed daily, as it is more likely to be the macronutrient, rather than the micronutrient, content, that stimulates consumption, given triggers such as hunger, thirst and convenience.

The BfR's maximum levels for food supplements and fortified foods are so low in many cases, because its model attempts to take into account parallel consumption both of multiple fortified foods as well as multiple food supplements. Quoting from its 2005 report on *Safe Use of Vitamins: Toxicological and nutritional-physiological aspects*:

> "This sequential procedure and the separate derivation of daily maximum levels for food supplements and fortified foods aims to take account of multiple exposure which may result from the daily parallel consumption of both product categories (food supplements, fortified foods) and also of the parallel daily consumption of several products within a category (e.g. consumption of several food supplements per day). At the same time, this procedure aims to facilitate the flexible handling of multiple exposure and to reflect the specificities of food supplements and fortified foods."[30]

This assumption that takes into account the possibility that consumers will ingest, in particular, multiple food supplements daily stems from an excessively precautionary mindset and impinges severely on the principles of consumer rights and freedom of choice. Consumers, especially in Europe, have had a long history of determining safety information and nutritional facts from product labels and are more than able to take into account the additive effects on daily vitamin and mineral levels when consuming multiple supplements.

Assuming that the levels of vitamins and minerals (including their respective forms) are clearly specified on product labels, consumers should be allowed to make informed choices over their total intake of nutrients, in view of their own perceived requirements. Consumer education is therefore one of the most important factors governing safety (which is dose-dependent), given that there is nothing to stop individuals consuming large quantities of food supplements and/or fortified foods if they wish to consume high or excessive intakes. Without substantive evidence of the dose response in humans, it is not possible to determine properly what constitutes high or excessive intakes; this is clearly apparent from the long-running controversy on vitamin C.

However, a 'belt and braces' approach, greatly preferable to the excessively precautionary approach taken by the BfR, would be to add a new column on the nutritional facts panel of food supplements which specifies the Safe Upper Level, in combination with an additional mandatory statement on food supplements that indicates, in words to the effect: "If taking more than one supplement daily, ensure that you do not consume, unless otherwise directed by your health professional, more than the Safe Upper Level of any single nutrient".

[30] Domke A, Großklaus R, Niemann B, Przyrembel H, Richter K, Schmidt E, Weißenborn A, Wörner B, Ziegenhagen R. *Use of Vitamins in Foods Toxicological and nutritional-physiological aspects*, Part I, 2005, Federal Institute of Risk Assessment (BfR), Berlin.

Intake of vitamins and minerals from dietary sources

- **EC QUESTION 4: The Commission would appreciate receiving available information on intakes of vitamins and minerals or indications of the best sources providing such data at EU level.**

ANH ANSWER: One of the significant deficiencies in the two-stage USL to MPL model proposed, is the absence of high quality and comparable data in many situations. Apart from huge data gaps in relation to dose-responses and human safety issues, there are also massive data gaps in relation to reliable data which can be used in the manner proposed. As the EC is aware, reasonably good data exists for the UK and the Netherlands, but how applicable is this to southern Europe or Scandinavia? There are concerns that the RIVM (NL) data may over-state supplementary intakes and owing to different methodologies, are not directly comparable with the FSA (UK) data. Geographic variations in nutrient quality, dietary patterns and lifestyle, as well as varying individual nutritional requirements in different countries and different methodologies used in deriving data, mean that data from any one, or a limited number of countries, are likely to be inappropriate for EU-wide use.

In the interests of developing meaningful and proportionate measures for maximum levels, it is recommended that levels are not finalised until accurate intake data have been collated or collected across a *representative range* of Member States, including northern and southern Member States, and representatives from eastern Europe which joined the EU during its recent enlargement phase.

The generation of MPLs should await these data, and in the meantime, Member States should be left to regulate foods and food supplements independently, on the basis of available national intake data and nutritional requirements.

- **EC QUESTION 5. If such existing data refer only to the intake in some Member States, can they be used for the setting of legitimate and effective maximum levels of vitamins and minerals at European level? On the basis of what adjustments, if any?**

ANH ANSWER: As discussed above, there is no scientific rationale in applying intake data from one Member State to another, or all others, when it is known that there are great variations in nutritional intake and also requirement, particularly for some nutrients. For example, Scandinavian dietary vitamin D requirements are high, while they tend to be low for many southern Europeans who are exposed readily to sunlight. Conversely, carotenoid intakes of southern Europeans tends to be substantially higher than those in northern Europe, while Scandinavian intakes of vitamin A (retinoids) are considerably higher than those in many other parts of Europe.

Additionally when comparing different national food intake databases, it is essential that the comparability of data is established.[31]

- **EC QUESTION 6: Should the intake from different population groups be taken into account in the setting of maximum levels of vitamins and minerals?**

ANH ANSWER: By applying adjustments for sensitive population sub-groups to the calculation of EU-wide MPLs (or USLs), large numbers of consumers could be prevented from readily meeting optimum nutritional intakes. The most appropriate way of dealing with sensitive sub-groups is by stipulating warnings on labels. For example, the risk manager (regulator) might deem that a warning directed at smokers and asbestos workers should be included on products containing more than 5 or 10 mg synthetic beta-carotene, based on data from the ATBC[32] and CARET[33]

[31] Hakala P, Knuts LR, Vuorinen A, Hammar N, Becker W. Comparison of nutrient intake data calculated on the basis of two different databases. Results and experiences from a Swedish-Finnish study. *Eur J Clin Nutr.* 2003; 57(9): 1035-44.

[32] Alpha-Tocopherol, Beta Carotene Cancer Prevention Study Group. The effect of vitamin E and beta-carotene on the incidence of lung cancer and other cancers in male smokers. *New England Journal of Medicine*, 1994; 330: 1029-1035.

trials, given that the remainder of the population is likely to benefit considerably from carotenoid intakes substantially above these levels.

However, for nutrients where there are health concerns over high intakes (e.g. fat soluble vitamins, zinc, selenium, etc.), it is appropriate to set maximum levels separately for two different age groups, namely adults and children.

Populations consist of individuals with diverse nutrient requirements. It is necessary to set minimum and maximum limits to encompass the diversity of both individual genetics and requirements.

Reference intakes of vitamins and minerals

- **EC QUESTION 7: Taking into account all the above-mentioned considerations, how far should PRIs/RDAs be taken into account when setting maximum levels for vitamins and minerals?**

ANH ANSWER: There can be no scientific rationale for using Population Reference Intakes (PRIs) or Recommended Daily Allowances (RDAs) for the establishment of maximum levels, as these are not based on safety/risk considerations and do not adequately consider benefits associated with higher intakes.

If PRIs and nutrient intakes, as well as adjustments for "varying degrees of sensitivity of different consumer groups", are taken into account in the setting of MPLs (as stipulated in Article 5 of the Food Supplements Directive and Article 6 of the proposed food fortification regulation), it is not inconceivable that, in some cases, the cumulative effects of subtraction and division of the upper levels will result in MPLs which are lower than the RDAs. This would be clearly absurd.

Some of the PRIs, RDAs and US Dietary Reference Intakes (DRI) are badly in need of review to take into account advancements in science. The National Institutes of Health (NIH) have for these reasons apparently initiated a review of US DRIs (Dr Beth Yetley, NIH, pers. comm..).

---

[33] Omenn GS, Goodman GE, Thornquist MD, Balmes J, Cullen MR, Glass A, Keogh JP, Meyskens FL, Valanis B, Williams JH, Barnhart S, Hammer S. Effects of a combination of beta-carotene and vitamin A on lung cancer and cardiovascular disease. *New England Journal Medicine*, 1996; 334: 1150-1155.

MINIMUM AMOUNTS

- **EC QUESTION 8: Should the minimum amount of a vitamin or a mineral in a food to which these nutrients are added be the same as the significant amount required to be present for a claim and/or declaration of the nutrient in nutrition labelling? Should different minimum amounts be set for certain nutrients in specific foods or categories of foods? If yes, on what basis?**

ANH ANSWER: Clearly, 'minimum' or 'significant' amounts, in the absence of risk/benefit assessment of individual nutrients, are not accurate reflections of scientifically-established levels required to provide significant health benefits (since health benefits or promotion have not been properly considered in either the establishment of RDAs or PRIs).

Therefore, where claims are not made, there can be no justification in stating anyminimum amount, as the consumer can make a judgment on the amount of vitamins and minerals from the nutritional facts on the label, as presently required under EU nutrition labelling laws.

If claims are made, it would be logical to set amount differently for fortified foods and food supplements, on the basis of the different intended purposes of these food groups. In the case of food supplements, the level required to make a claim could be 50% of the RDA or another level on the basis that there is sufficient scientific evidence to justify the claim at the prescribed dosage rate. For fortified foods, given the greater likelihood of variable consumption rates (stimulated by factors such as hunger, thirst and convenience, rather than, as for food supplements, the specific intention to increase vitamin and mineral intakes), this level could be lower and could be in line with the significant amount required to be present for a label declaration in nutrition labelling.

- **EC QUESTION 9: Should minimum amounts for vitamins and minerals in food supplements also be linked to the significant amounts that should be present for labelling purposes or should they be set in a different way?**

ANH ANSWER: This question has effectively been answered above.

CONCLUSIONS TO ANH CONSULTATION RESPONSE

The EC and EFSA appear to be prematurely seeking to establish limits on allowed vitamin and mineral ingredients (and soon phytonutrients, essential fatty acids, amino acids, and other groups of nutrients) (under Article 4 of the Food Supplements Directive) as well as limits on dosages (Article 5) when proper methodologies for risk assessment, and more specifically risk/benefit assessment, have yet to be defined and validated properly.

Such an approach can only be made to work if extremely and disproportionately precautionary approaches are adopted, and while these can be justified for environmental chemicals and other toxins, there is no evidence of adequate justification for their use in the case of nutrients which are consumed primarily for their beneficial properties.

We draw the EC's attention to the recent work of the HAN Foundation in this regard, including one paper already published in *Environmental Liability*[34], and another, already in press and soon to be published, which has been submitted to the EC as part of this consultation process.

In terms of consumer protection, there is already a legal requirement for food business operators to ensure, under Regulation (EC) No 178/2002 of the European Parliament and of the Council, that foods presented for sale are safe. The multiple layers of precaution that are being considered in some of the proposed risk assessment/management approaches result in the excessive reduction of the MPLs so that, for given nutrient forms, they cannot be justified scientifically. Moreover, instead of protecting public health, they risk having the reverse effect by reducing consumer access to nutrients and dosages that would otherwise benefit (promote) both human health and well-being.

The ANH is presently engaged with academic institutions in the establishment of a post-doctoral research programme that aims to develop a viable nutrient specific risk/benefit assessment model applicable particularly to food supplements. It is our view that the proposed legal enforcement across the EU of maximum levels cannot at present be justified *either legally or scientifically*, and should at least await the development of validated risk/benefit assessment models, clearly an area that EFSA has already recognised as being of crucial significance.

The ANH welcomes discussions about these issues with both the EC and EFSA and looks forward to a formal rejoinder to this consultation response.

Alliance for Natural Health
29 September 2006

[34] Hanekamp H, The precautionary principle: a critique in the context of the Food Supplements Directive. *Environmental Liability*, 2002, 2: 43-51. The peer reviewed paper can be downloaded from: *http://www.alliance-natural-health.org/_docs/ANHwebsiteDoc_239.pdf*.