Nutrition Information Services

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SURVIVING THE BRITISH DIET

An appraisal of problems of diet in the UK, placing an emphasis upon the role of daily nutritional supplementation in offsetting deficiencies that occur as a result of wrong food choices.

Introduction

When we talk of the British diet we are speaking about the diet of a sophisticated and wealthy nation. Some react with horror at the idea that there can possibly be anything wrong with it. It is obvious that it contains sufficient food – indeed it contains too much for many people, with obesity increasing greatly in our society. Despite this, the average longevity of the population is increasing steadily. So what is wrong with the British diet, apart from there being too much of it?

Lambert-Mount (1979) published a little-noticed but potentially epoch-making book that, at the time of it's writing, was a major critique of the British diet. He highlighted destructive food processing methods, the nutritional problems of white bread, deficiencies of vitamins and minerals, including sodium to potassium ratios, the importance of excess fat intake including fried foods, foods that increase the blood cholesterol and the effects upon health of excess sugar consumption. He stressed the importance of vegetable intake, often found to be woefully lacking in our diet.

He stressed the problems within our society of infant and child nutrition, the nutritional difficulties of the elderly and the increasing losses of working time in the population through health-related absences from work.

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He addressed specifically heart disease, obesity, diabetes, hypertension and peptic ulcers and the relationship of each of these to the make-up of the daily diet. He identified the connection between the nutritional quality of foods and the agricultural methods used to produce them, noting nutrient deficiencies in soils handled by the more modern agricultural methods. The book was supplied plenty of evidence to back up its arguments, with referencing provided for each chapter.

Since Lambert-Mount's book was published we have come to appreciate much more about these vitally important connections. The importance of the essential fatty acids has come to the fore together with the balance between the two classes of them, Omega 6 and Omega 3. The crucial importance of antioxidants has also come to the fore as the role of free radicals as causative agents in chronic disease has become widely recognised. It is now obvious that by managing these two factors alone we could greatly reduce the incidence of many chronic illnesses. We also have better information about toxins that find their way into food and drink via the environment and in other ways as a result of today's lifestyle.

There is still some controversy over these issues, especially between orthodox nutritionalists and those who align themselves with the philosophy and outlook of alternative and complementary medicine and health. This is particularly true of the negative health effects of wheat and milk, well recognised in alternative and complementary circles and yet stoutly defended by orthodoxy, which tends to be aligned with the respective branches of the food industry.

What to do about the defects of the British Diet

The British diet is an entirely optional hazard. If determined enough, one can almost completely discount its negative effects on personal health by simply changing from the "British diet" to a diet of another kind, one that is rich in micronutrients. One might also take an appropriate spread of supplementary nutrients at optimum daily intakes, to prevent nutritional deficiencies. This would certainly provide protection against any lack of nutrients in the food. One needs to be sufficiently well informed about the nutrient content of different foods to ensure a real, large and lasting improvement. Despite arguments raised in the media recently by very "orthodox people", questioning the merits of organic foods, it is obvious that organic foods contain less pesticides, and there is growing evidence that organic foods also offer better nutrition (Heaton 2001).

Avoidance of the British diet is the route favoured by this author, but it is obvious that relatively few people are willing and/or able to take that route. They will need to be true enthusiasts, singularly dedicated to the task of ensuring their own longevity and good health. They will require the strength of purpose to go against the norm in the culture in which they live and resist peer pressure to conform. What is more, and what is even more difficult, they will need to do this consistently. This newsletter is written for people who cannot quite manage to do that.

For example, fried fish and chips and other fried items contain a great deal of fat, fat which has an imbalance of Omega 6 and Omega 3 fatty acids and that has been damaged by oxidation during high temperature cooking. On a night out your friends hand you a packet of fried fish and chips and want you to join in – there is social pressure there – and anyway, you like fish and chips. What are you going to do? What are you going to do the next time, and the next time after that?

Avoidance of Adverse Foods

Compared to following quite stringent dietary rules, taking supplements is relatively easy so long as you can afford to buy them. To help us understand what one may hope to achieve by doing with supplements, we need to appreciate what supplements can and cannot do.

As we have seen, the cardinal sins of the British diet involve taking too much of something that is inherently bad for you. Within that category comes too much sugar and sugary foods; too much fat and the wrong type of fat (e.g. too much saturated fat or too much Omega 6 fat); too much salt; an excess of dairy or wheat products; too much meat and too many animal products generally, too much tea or coffee; and too much alcohol. If you continue committing these cardinal sins unabated, then you cannot realistically hope that taking supplements will spare you from all of the adverse effects of this type of diet. However, supplements may well partly ameliorate the effects of dietary errors by increasing the body's resistance to the adverse effects of bad food.

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A person who intends to continue with the British diet and all the adverse aspects that entails is really rather unwise, but they will still be significantly better off for using well selected supplements, i.e. supplements selected for relevant reasons, than they would be without them. The positive benefits of supplements taken without dietary change are well documented. However, anyone feeling unable to dispense with the British diet should, at the very least, take steps to moderate its worst features. Using well chosen supplements and at the same time reducing and controlling the extremes of the British diet would be a wiser combination.

Getting Enough Micronutrients

The above dietary errors all involve taking foods that one should preferably either not take or strictly control. However, an altogether different type of dietary sin is that of taking a diet that is deficient in something, usually one or more micronutrients. Modern diets are almost never deficient in bulk nutrients (protein, carbohydrate and fat) but are very prone to micronutrient deficiencies. It is possible to take an average British diet and work out whether or not it will deliver sufficient of each vitamin, mineral or other nutrient. An average British diet of this kind does not represent the actual diet of any individual but its adequacy or inadequacy in particular nutrient will give us a guide as to the overall status in that nutrient of the whole population.

Given this vulnerability to micronutrient deficiency in the diet of an affluent nation, we know of course that individual members of that population will have diets that span a wide range of different compositions. People who eat mainly junk food will always tend to have accentuated nutrient deficiencies. Often these people's nutrient status reflects an exaggeration of the national overall trend.

There is in any case a strong trend towards micronutrient deficiencies in the diets of developed and affluent nations. Part of this comes from our Western lifestyle: freely available labour-saving devices such as cars and other transport, tractors and labour-saving household machines. People expend less energy under these conditions and therefore require less food energy. The resulting lack of exercise leads towards obesity if food intake is not sufficiently reduced. But if it is reduced, as generally happens, then less food taken in means less micronutrients are taken in also. What affluent nations need, therefore, is to increase the micronutrient density of the food supply. What they usually get is much less micronutrient-dense foods because they eat a higher proportion of processed and prepared or formulated foods. These have typically passed through micronutrient-depleting processes or have been formulated with refined, micronutrient-depleted ingredients.

Modern agricultural practices, depending upon chemical fertilizers, also tend to produce crops relatively deficient in those microminerals that are not contained in these fertilizers. There is, therefore, a combination of factors that tend to act together to reduce the micronutrient content of the British diet. The result is a combination of several different mutually reinforcing factors that all tend to affect the diet in the same detrimental way. This affects the national diet very powerfully.

This aspect of the British diet therefore tends to produce deficiencies and imbalances of micronutrients. These, at least, can be corrected readily with supplements. It is possible to work out which micronutrients are more or less endemically deficient in the national average diet and which of them are actually adequately provided, despite the major nutritional problems that exist in Britain. Obviously there is a distinction here between, on the one hand, those aspects of the diet that produce deficiencies that can be easily remedied and those problems that come from consuming large amounts of adverse dietary items. The latter introduce substances with harmful effects not likely to be fully reversed by using supplements.

Individual Variations in Diet

Obviously it would be foolish to base any actions upon an assumption that everyone in the UK eats the same diet. The so-called British diet is real in the one sense in that it gives us a feel for the average characteristics of what the nation eats and where the principal defects and deficiencies lie. In-so-far as one's diet approximates to the average British diet one may or may not be able to fairly draw conclusions about one's own dietary situation by studying the national average situation. This will lead to certain conclusions about one's exposure to the risks of developing several of the named chronic diseases that are linked to dietary deficiency.

People who regularly eat large quantities of fruit and vegetables and eat organic whole grains and pulses and who eschew fried foods, dairy products, crisps and other salty foods, alcohol, sugar and sugar confectionery and refined fats are not average UK citizens. Conclusions that arise from studying the nutritional characteristics of the British diet simply do not apply to them. Yet for every one of these special folk there are a good many others who eat far more of these foods than the average. These represent the other extreme. At the same time, many of these people also eat almost no fresh fruit or vegetables.

These folk place themselves in great danger from numerous chronic illnesses that may appear at any age, but the risk clearly rises steeply with advancing years.

This fact, which may be disputed to various degrees in orthodox circles, lies at the very basis of the practice of Nutritional Medicine.

Certain groups within the population are exposed to greater than average risk from dietary deficiency than other groups. Income is one important factor that influences the nutrient content of household diets. Where the weekly income of the head of household is less than £180, the diet contains more fat, more cholesterol, less beta-carotene and far less Vitamin C than those in the A category with an income of more than £725. (Interestingly, the lower income group gets more calcium than the 'A' group.) Households with children differ from those without, pensioners constitute a special group and there are differences in nutrient intake from one part of the country to another, depending upon dietary habits. However, probably by far the greatest factor for any individual will be his or her food preferences and the degree to which the individual or the household takes trouble over food preparation, thereby avoiding processed foods and ready-meals.

The Implications of Nutritional Medicine

Nutritional Medicine (also called Nutritional Therapy) consists of the professional use of carefully complied prescriptions of diet, supplementary nutrients and natural detoxification procedures to treat or prevent ailments and to promote optimal health. Practitioners may also employ lifestyle precautions by which to avoid ingestion or inhalation of toxins, non-drug procedures to promote colon health, the use of nature-derived nutriceuticals, avoidance of allergens and the use of herbal, homoeopathic or naturopathic remedies in a secondary capacity that is adjunct to and supportive of the primary use of foods and nutrients (Plaskett 1996).

The practice of Nutritional Medicine relies upon the assertion that standards of intake of important nutrients greatly influence the risk of developing either symptoms or illnesses. Furthermore, by way of a quite crucial extension, it is also asserted that, in a high percentage of cases, by addressing nutritional standards after developing chronic symptoms of illness one can expect to improve the patient's condition or affect a cure. Today the practice of Nutritional Medicine is a professional occupation in its own right. Among its patients one finds an untoward proportion of people who have been eating a lot of bad foods and who largely fail to eat fruit and vegetables.

The British Diet Must Affect Health

Here we want to address mainly the dietary aspect and its effects upon illness. Although the British diet reflects only an average taken across the entire nation, it nonetheless provides insight into the overall nutritional strengths and weaknesses of the nation. Although individuals may eat a diet that is greatly different from the average – which will be to his or her advantage or disadvantage – we still expect to see those nutritional features that influence health to be reflected in the pattern of chronic illness that affects us nationally.

What is in the British Diet?

The UK supermarkets and other shops stock a wide range of fresh fruit and vegetables, but far more processed items. The make-up of the British diet is known from the Government's National Food Survey (e.g. MAFF 1990, DEFRA 2000). The pattern of consumption changes only gradually over the years, although over several decades significant changes do occur. This can be seen by studying those MAFF reports that have been issued at approximately ten year intervals since 1940. The following figures from the year 2000 DEFRA survey probably provide a fair indication of the state of the nation. The survey figures are provided in terms of fresh weight. This can be confusing because the moisture content differences between the food classes are unresolved. It is only the solids content of the foods, not the moisture, that count towards nutrition. The figures quoted below have involved recalculation on the basis of dry-weight to obtain a truer picture of the percentage contribution to the total diet from each of the main sources.

The total liquid milk and cream we consume in these islands is the equivalent of 313g per day, or about 31g per day of dairy dry matter. In the dairy class we have also to take cheese into account, which amounts to 19.6g per day. The figure for liquid products has been falling over the years while the figure for cheese has increased. The total consumption of dairy in these particular forms amounts to 50.6g/day or 10.5% of the diet.

Our average consumption of meat and meat products amounts to 164g/day (down from 193.1g in 1955). The meat products component of this complicates our picture, for these contain cereals and added fat as well as meat and their moisture content may be variable. If we use an approximation, that meat comprises 36% solids, then the input of meat solids to the diet is 58.9g/day or about 12.2% of the diet.

Fish contributes only 29.1g/day or 6.0% of the diet. This has stayed fairly constant since 1955. Fats contribute 34.9g/day (down from 60.1g in 1955) or about 7.2% of the diet. Sugar and sugary preserves amount to 26.3g/day (down from 106g in 1955), while about 5.1g is provided via confectionery. In all these sugary products represent about 6.5% of the diet.

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Vegetables, fresh and processed, amount to 348.4g/day, which would amount to about 29.61g/day of vegetable solids or 6.1% of the diet. This has dropped from 460.3g in 1955. However, one should note that of this total some 51% represents potatoes, both as fresh potatoes and processed potato products such as chips and crisps. Potatoes are far less nutrient-dense than other vegetables and hence are less valuable for the purpose we are discussing here. Fruit, fresh and processed, amounts to 208.2g/day, or 18.1g of solids, or 3.8% of the diet. This is up from 161.3g in 1955.

Cereals and cereal products amount to 233.7g/day or about 219g of dry matter and 43.2% of the diet. This is down from 387.7 in 1955, which represents one of the largest recent changes in our national diet. Beverages contribute some 11.3g per day or 2.3% of the diet. All other foods listed by National Food Survey amount to 48g/day but it is hard to calculate their solids content because they contain widely varying amounts of moisture. Guessing this at an average 20% moisture, this leads to 10g of solids per day or 2.2% of the diet. These figures, taken together, make up 100% and correspond to an average total food solids intake in the household of 481.6g/day/person.

These raw figures entrain some quite important inaccuracies due to the wide range of foods falling into each class. For example, if the contribution of nutrients from meat were to be calculated by interpreting the meat category as 100% true meat, we would overestimate the nutrients coming from that source. This is because some of the meat category is represented, for example, by meat pies, which are not all meat but contain major components of added refined fat and cereal (in the pastry and as rusk), and also salt. In the same way, the cereals category is not composed of just cereals, but entrains extra refined fat and sugar in the portion that is ascribed to cakes. Due to the ways in which extra amounts of refined fat and sugar creep into the diet unnoticed in composite products of these types, it is all too easy to under-estimate the proportions in the diet of refined fat, sugar and salt.

Similarly, to estimate the impact upon British nutrition of the very large and important cereals element of the diet, one must know what proportion of this cereal is derived from whole meal as opposed to refined sources. White bread and white flour has a major influence upon the nutrient content of the British diet since these are such poor sources of both minerals and vitamins. We cannot get at the true level of intake of either refined fat or sugar because these are included as ingredients into other listed products like “cakes”, as just mentioned, but also ice-cream, confectionery, pastry or ready-meals. In the next stage, therefore, we need to take into account the actual micronutrient content of the British diet and the deficiencies, either overt or relative, which emerge from this calculation, as done by National Food Survey.

The Content of Nutrients in the British Diet

The National Food Survey figures are not presented in a way that allows us to deduce the daily intakes of UK adults or UK children separately. Rather, the food consumption of families as a whole is reported. The only way we can approach the average adult consumption of nutrients using this data is to refer only to those columns that report upon the consumption of households containing adults and no children. We have used the figure for households of two adults for this purpose. Also, the National Food Survey deals only with household food purchases, omitting meals taken away from home, though it does acknowledge the number of meals per week that are consumed in this way by different sorts of households. The table below gives the adult intake, calculated in this way, of the bulk nutrients and those micronutrients that are addressed within the pages of the National Food Survey.

Estimates from the National Food Survey (1990) and DEFRA (2000) of the supply of nutrients from the British diet.

NUTRIENT AND UNITS OF MEASUREMENT	DAILY INTAKE 1990	DAILY INTAKE 2000
Energy (kcal)	2169	2010
Total protein (g)	73.5	77.4
Animal protein (g)	43.9	48.3
Total fat (g)	102	87
Fatty acids:		
Saturated (g)	40.7	34.1
Monounsaturated (g)	37.7	30.9
Polyunsaturated (g)	16.3	15.9
Carbohydrate (g)	255	246
Calcium (mg)	918	960
Iron (mg)	11.8	11.6
Zinc	-	9.4
Magnesium	-	267
Sodium	-	2930

NUTRIENT AND UNITS OF MEASUREMENT	DAILY INTAKE 1990	DAILY INTAKE 2000
Potassium	-	3120
Thiamin (mg)	1.47	1.63
Riboflavin (mg)	1.84	1.98
Niacin (mg)	13.9	-
Niacin equivalent (mg)	29.4	32.3
Vitamin C (mg)	62	72
Vitamin A (retinol) (mcg)	969	640
Beta-carotene (mcg)	2275	2070
Total retinol equivalent (mcg)	1348	990
Vitamin D (mcg)	3.70	3.94
Vitamin E (mg)	-	11.72
Folate (mcg)	-	297
Vitamin B12 (mcg)	-	2.3

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Alternative figures come from Department of Health (1991) and Garrow et al. and from these one may often obtain separate estimates for men and women. These produce a further list as follows:

Alternative figures from Department of Health (1991)

NUTRIENT AND UNITS OF MEASUREMENT	DAILY INTAKE
Folic acid (mcg)	330 (men), (209) women
Pantothenic acid (mg)	6.1 (men), 4.4 (women)
Biotin (mcg)	39 (men), 26 (women)
Vitamin E (mg)	Estimates vary from 4.7 to 11.9mg /day
Magnesium (mg)	323 (men), 237 (women)
Sodium (mg)	3376 (men), 2351 (women)
Potassium (mg)	3187 (men), 2434 (women)
Zinc (mg)	11.4 (men), 8.4 (women)
Copper (mg)	1.63 (men), 1.23 (women)
Selenium (mcg)	65
Manganese (mg)	4.6
Iodine (mcg)	243 (men), 176 (women)
Fluorine (mg)	1.82 from diet rising to 2.90 with use of fluoridated water
Non-starch polysaccharides (dietary fibre) (g)	11-13
Sucrose (total in diet((g)	104

These figures tend to show up a fully adequate supply of bulk nutrients. They do, however, omit to display the really significant divide between status in Omega 6 and Omega 3 fatty acids. This is because the category "polyunsaturated fatty acids" is not broken down as to type. This is an extraordinary omission that reflects official lack of concern about this very important dietary parameter. The figures do display the excessive fat consumption of the diet, though, through their nature, they do not reveal the poor quality and/or damage to the dietary fat from oxidation.

The national sodium and potassium imbalance is clearly revealed as being gross and important, since a ratio between these minerals close to unity is quite compromising in its health implications especially in relation to hypertension and the risk of circulatory disease.

They also show that the dietary supply of iron is generally unsatisfactory for women in their reproductive years. The figures also highlight the areas of distinct disagreement between the orthodox and "alternative" positions. These disagreements arise in connection with the requirements for pantothenic acid, Vitamin E, magnesium, zinc, selenium, manganese and dietary fibre. Chromium would be in this list too if we had any reliable UK intake figures. The level of dietary fibre is nowhere near enough. These are important confrontational areas between the orthodox and alternative views of nutrition.

These points having been made, it is a general criticism of the UK diet that even where micronutrient intakes do reach the UK official recommendations, these recommendations are often far too stingy. In the light of evidence concerning the protective attributes of rather higher (or in some cases much higher) intakes of micronutrients than the officially recommended amount, these need revising upwards. Too many nutrients are subject to a somewhat miserly view by Government sources and hence many of us believe that the protection of the public from chronic illness is being compromised. It is hard to avoid suspecting the Government committees of trying hard to make the nutrient recommendations fit closely to the current pattern of consumption, although of course we do not know the exact nature of their deliberations.

To various degrees it may still be necessary to buy from health-food shops the different types of organic and wholegrain cereals that one needs if one is going to make any attempt at all to derive improved levels of micronutrients from one's food. However, products sold in health-food shops are often far from perfect in their nutritional make up: many, for example, still containing excessive salt. Hence, the knowledge factor in designing diets is so very important.

Nonetheless, there is compelling evidence that it is actually hard to obtain fully adequate amounts of micronutrients from today's food alone, given that we eat less of it than in the recent past and that most of it is grown using nutrient-depleting techniques. The evidence that we need regular supplements to put us out of danger of overt or relative deficiency is hard to resist, especially when multiple nutrient requirements are taken in to account, rather than focusing on just one of them.

Key Supplements Needed to Augment the British Diet

The commonest idea among the public about nutritional supplements is to aim to provide everything. That means all the vitamins and minerals known to be essential for good health. However, by analysing and assessing the nutrient content of the British diet we have been able to ascertain that even the average British diet, with all its defects, can provide a sufficient amount of many nutrients. If we want to plan a supplement programme to suit the British diet and prevent deficiencies, then we can leave out the nutrients of which the diet already provides sufficient. To achieve our aim we must identify the micronutrients that are in shortest supply in the nation's food. These will then go into the supplements programme. That supplements programme will then act in a sense as "nutritional antidote" to the British diet. In other words, if you are determined to eat the British diet, here is a way to overcome some of the worst nutritional effects.

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In respect of critical nutrients one may also wish to take the view that the daily allowances (RNIs) recommended by the UK governments' learned committees on nutrition are commonly very stingy compared to the corresponding levels published from their US counterparts. The considerations that led the Americans to their conclusions seem to have been largely ignored. These allowances also largely ignore the powerful research literature that shows the benefits of taking, in certain cases, intakes of nutrients that are in excess of the RNIs. These benefits are in terms of reducing the risk of developing complaints or reducing the effects from already acquired diseases or symptoms. Obviously there have to be safeguards against consuming an excess of the few nutrients that may exert toxic effects when the intake is too high, as is the case with Vitamins A and D and selenium, especially the inorganic form of selenium, sodium selenite.

We now look at specific nutrients and how they should be used to supplement the deficiencies in the British diet. To do so involves making certain assumptions or forming certain opinions. In some cases these will be at variance with those of the learned Government-sponsored committees. Nutritionalists within the alternative and complementary sector also take into account nutrient-wasting lifestyle factors such as smoking, overuse of tea and coffee, alcohol and the contraceptive pill and other drugs.

MAGNESIUM

It is not widely known that magnesium intake in the UK is less than the UK RNI for a large swathe of the population. US recommendations are 29% higher for women and 33% higher for men than the UK RNIs. Average UK intakes are well below these US figures. The estimated intake of magnesium for an average British woman is only 237mg/day according to the Dietary and Nutritional Survey of British Adults (1991). This is 87% of the UK RNI but only 67% of the American recommendations. Many nutritionalists consider that for optimum health magnesium intake should be above even the US recommendations. Remember that, given the wide spread of different dietary practices, a large percentage of the population, possibly half, will have intakes that are below the average intake for any given nutrient.

B VITAMINS

Mostly, the B Vitamins in the UK diet reach the RNIs that have been set. However, folic acid, pantothenate (Vitamin B5) and Vitamin B6 are considered the most vulnerable of them. These particular ones should be included in our envisaged supplement programme. It is noteworthy that two of these, folic acid and Vitamin B6, are involved in keeping the blood homocysteine level down and therefore offer an important protective effect against arterial disease and heart attacks.

IRON

The UK RNI for iron in women of childbearing age is 14.8mg/day but in the UK the average woman obtains only 11.6mg/day from food. Even among those women who receive the RNI, 10% of them will find this inadequate through higher than average menstrual loss. Hence any supplement intended to be adequate for both sexes must supplement iron.

CALCIUM

The average UK diet contains enough calcium to be more than sufficient for most people. Nonetheless, the heavy consumption of calcium supplements continues unabated. In some circumstances these may contribute to bone maintenance, but many nutritionalists consider that the prime reasons for loss of bone density is caused by other nutrients and other physiological factors rather than just calcium deficiency. Bone is a complete living tissue with its own full complement of nutrient requirements. It does not thrive just on calcium. Bone will fail to maintain its full mineral content if calcium is genuinely deficient in the diet, or if Vitamin D is deficient. However, in most UK cases of osteoporosis, calcium deficiency is not a main factor. The loss of bone density seems to be caused or magnified by other nutritional deficiencies, such as zinc, folic acid, magnesium, copper, manganese or chromium, Vitamin K and exacerbated by sodium and potassium imbalance.

ZINC

Average UK diets meet the UK RNI levels of 7mg/day for a woman and 9.5mg/day for a man. The concern here is that the UK RNIs have been drastically cut in recent years. This gives rise to grounds for anxiety when US levels are set at 71% higher than UK levels for a woman and 57% for a man. It is hard to trust the UK figures in these circumstances, given the UK habit of slashing RNIs across the board. We think it wise to supplement zinc.

MANGANESE

Although we think that all schools of thought recognise that manganese is essential, the conventional estimates of daily requirement vary between 2 and 3mg/day. Common types of Western diets including the UK provide between 2 and 9 mg/day. In orthodox nutrition it is therefore usually assumed that manganese is a nutrient which we need not worry about at all. Pfeiffer, on the other hand, who has done extensive laboratory and clinical work on manganese status, considers that the average daily requirement is between 10 and 20 mg/day. This estimate places the average Western diet significantly into deficit. Indeed, even with whole food diets and therapeutic diets, these are unlikely to reach 10mg/day, let alone 20mg/day, unless the diets are carefully thought out and designed with that specific intention.

Pfeiffer concluded that the adult male has a particular problem with manganese absorption from the intestine. Here then is another clear case of a dispute between orthodox and the new alternative and complementary schools of thought. It seems best to provide for more manganese than is commonly thought necessary in orthodox circles. One may perhaps suggest a supplement of up to 5mg/day, whereas Shrimpton (1995) concluded that up to 350mg/day was safe.

COPPER

The average dietary intake of copper seems likely to be unsafe in view of the catastrophic drop in the copper content of crops in the last 25 years (Paul et al 1980, Holland et al 1991). Also, the UK RNI has been dropped from 2mg/day to 1.2mg/day and indications that the RNIs may be in error through failing to take into account copper losses through the skin. Supplementation by up to 1mg/day would be likely to help to preserve immune and other copper-dependent functions.

SELENIUM

UK intakes of selenium have been estimated at about 65mcg/day, a figure that approximates to the UK RNIs of 60mcg/day for women and 75mcg/day for men. Worries arise from the fact that up to 50% of the population is likely to be below the RNI level and that there are multiple reports that levels considerably above the RNI are needed to provide good protection from diseases associated with free radical damage. Selenium really does seem to need supplementation to achieve better health safety. A supplement of 50mcg is advisable as a basic improvement over the dietary intake. Those wishing to achieve still better protection from free radical damage may wish to use more. Supplements of up to 300mg in an organic form have been suggested, but high levels in inorganic form should be avoided. The organic form selenomethionine, or else selenium-enriched yeast seems to be best, though their continued availability in the UK seems to be threatened by current EU legislation.

VITAMIN C

The UK RNI for Vitamin C has been whittled down from previous figures to only 40mg/day. The average UK diet meets more than this limited figure but the worry arises from doubt as to the adequacy of this low figure and the US adherence to the higher recommendation for 60mg/day. The thinking of the UK committee is similar to that of their American counterparts but, unlike the Americans, the UK Committee seems to allow no safety margin, so that again vulnerable individuals will be below that figure. With Vitamin C the protection of the body against free radicals is entirely at stake and it seems wise to supplement 50mg/day to overcome vulnerability. Plenty of authors recommend more than this.

VITAMIN E

Research data shows that the average UK diet contributes Vitamin E at between 3.5 and 19.5mg of alpha-tocopherol equivalents for men and between 2.5 and 15.2 for women. This is a particularly wide range of intakes across the population. The median levels are 9.3 for men and 6.7 for women. It is acknowledged that an individual's requirement for Vitamin E is affected by his or her intake of polyunsaturated fatty acids (PUFA). This also varies widely (5.1 to 29.0g/day). The UK expert committee thought that intakes in the range of 3 to 4mg/day might be "safe" but added that this may not be so in the long term. Even this can only be true for those who consume very little PUFA. Given the importance of free radical protection, long-term reliance upon intakes of Vitamin E that cannot provide adequate protection against significant intakes of PUFA seems likely to present a longer-term danger of chronic illness. Bearing in mind all the uncertainties here, along with the available evidence about the protective benefits of higher than average Vitamin E intakes, it seems much the safest thing to supplement this Vitamin to the extent of 10mg/day. One should bear in mind that most clinical trials to determine the safety of lower intakes of nutrients are fairly short-term, whereas the obvious risks arising from failure to take in enough are most likely to be long-term. There are no known risks for most subjects associated with taking Vitamin E at considerably higher values. Some authors recommend up to 800mg/day and hence the supplementation we suggest here is extremely modest.

VITAMIN K

In the US in 1989 definite values for dietary intakes of Vitamin K were recommended for the first time. In the past a range of intakes had been suggested based on the assumption that the amount of Vitamin K supplied by intestinal bacteria could vary from zero to as much as 50% of the requirement (National Research Council, 1980). Bacterial synthesis of menaquinones appears, however, insufficient to meet Vitamin K requirements when the intake of subjects is limited to approximately 50 mcg per day (National Research Council, 1989). Based on these studies and on the response of people with depressed levels of Vitamin K to intravenously administered doses of the vitamin, a dietary intake of about 1 mcg/kg body wt/day appears sufficient to maintain normal clotting time in adults.

One should note here that because the organisms that synthesize Vitamin K in the intestines are likely to be killed by antibiotics, that use of antibiotics is a major risk factor for producing a low blood Vitamin K. These drugs are therefore likely to dispose towards both osteoporosis and delayed clotting times.

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Vitamin K is found in abundance in green leafy vegetables (stressing the need to eat one's greens). The very best are broccoli, cabbage, spinach, lettuce, brussels sprouts, green tea and turnip greens, with watercress and asparagus not far behind. Therefore there is a real danger that those in the population who fail to eat green leaf vegetables will have the lowest Vitamin K levels.

Osteoporotic women have been found to have only 35% of the blood Vitamin K levels that are normal in age-matched controls (Hart et al 1985). In view of this finding it seems best to include a modest supplement of Vitamin K as a precaution in any supplement programme to offset the effects of the British diet. There are no clearly established average figures for the intake in the UK of Vitamin K in foods, only the above suspicion that there may be a sub-section of the population that is especially vulnerable to deficiency.

CHROMIUM

As we have mentioned, most clinical trials to determine the safety of intakes of nutrients are fairly short-term, whereas the obvious risks arising from failure to take in enough of the nutrient are most likely to be long-term. This means that RNIs and other types of recommendation appear to be set at levels that can only be relied upon to keep away short-term signs of deficiency. That may well be the case with chromium. The UK expert committee is vague about chromium requirements, suggesting that the safe adult intake is "above 25mcg/day". Chromium occurs in foods and supplements in different chemical forms and the ability of the body to absorb them is very different for those different forms. Given the lack of hard information about the availability of absorbed chromium from the diet and the adverse symptoms that may be averted by giving 200mcg or more daily of organic chromium of valency 3, it seems best to use a supplement of this mineral. Shrimpton (1995) concluded that 200mcg/day of chromium is a safe supplementary maximum. Therefore a supplement of up to 100mcg/day added to the British diet would appear to be both very useful and very conservative.

BORON AND SILICON

Modest daily supplements of boron and soluble silicon seem advisable because the intake of available silicon in the UK diet is unclear because biologically unavailable forms of it predominate in the diet. Also both boron and silicon are obtained mostly from fruit and vegetables and these are foods that are spurned by many individuals. It was calculated above that fruit and vegetables, even when potatoes are included, only amount to below 10% of the food solids in the UK diet. Boron is not known to be strictly essential but it is known to influence the retention of calcium in bone.

POTENTIAL HUGE BENEFITS OF SUPPLEMENTATION

Should it ever become practicable, the use of the supplementary nutrients listed above, comprising vitamins and minerals, would be expected to have a considerable effect upon the health of the nation and exert a major saving in the cost of the health service.

LOOKING TO A WIDER RANGE OF POSSIBLE SUPPLEMENTS

The list of nutrients addressed above, comprising basic vitamin and mineral supplements, is wide, but not comprehensive. With further recommendations it is possible to reach higher levels of sophistication if one wishes to counteract the British diet. Further development of the idea would comprise provision via supplements of those factors that are present in fruits and vegetables that are not recognised vitamins or minerals. These foods contain many biochemicals, some call them "nutriceuticals", that are beneficial to health without being known as essential nutrients. These include, particularly, the carotenoids and the flavonoids, many of which possess free radical quenching, anti-inflammatory and cell division-controlling properties, amongst others. Among the flavonoids would be quercetin and the catechins and proanthocyanidins. Among the carotenoids would be alpha and beta-carotene, lutein and lycopene. There would also be the fructo-oligosaccharides, which encourage lactose-fermenting bacteria in the colon, MSM (methyl sulphonyl methane) as a key sulphur nutrient and beta-sitosterol, a plant sterol that inhibits cholesterol absorption.

The British diet should ideally also be corrected to give a favourable ratio of Omega 3 to Omega 6 fatty acids. Omega 6 fatty acids predominate in the diet due to the prevalence of plant oils. This rebalancing may be achieved by including sufficient fatty fish in the diet or through supplements of either flaxseed oil or fish oil.

Obviously, providing all of these extra measures would be a major second line of defence against the British diet because, in the end, one should aim to provide all nutrients, whether dubbed "essential" or not, that influence health positively and which are in relatively short supply in our UK diet.

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NOTE

The information provided herein is for information purposes. It includes deductions from published research literature and also expressions of informed professional opinion on the subject. None of this should be construed as being medical advice to any person or persons. Such advice should be sought in clinic situations and on a one-to-one basis.

NOTE

In this newsletter "microgram" is abbreviated to "mcg" as is common on supplement labels, rather than the more scientifically accepted "mg". One microgram is one thousandth of a milligram or one millionth of a gram.

NOTES

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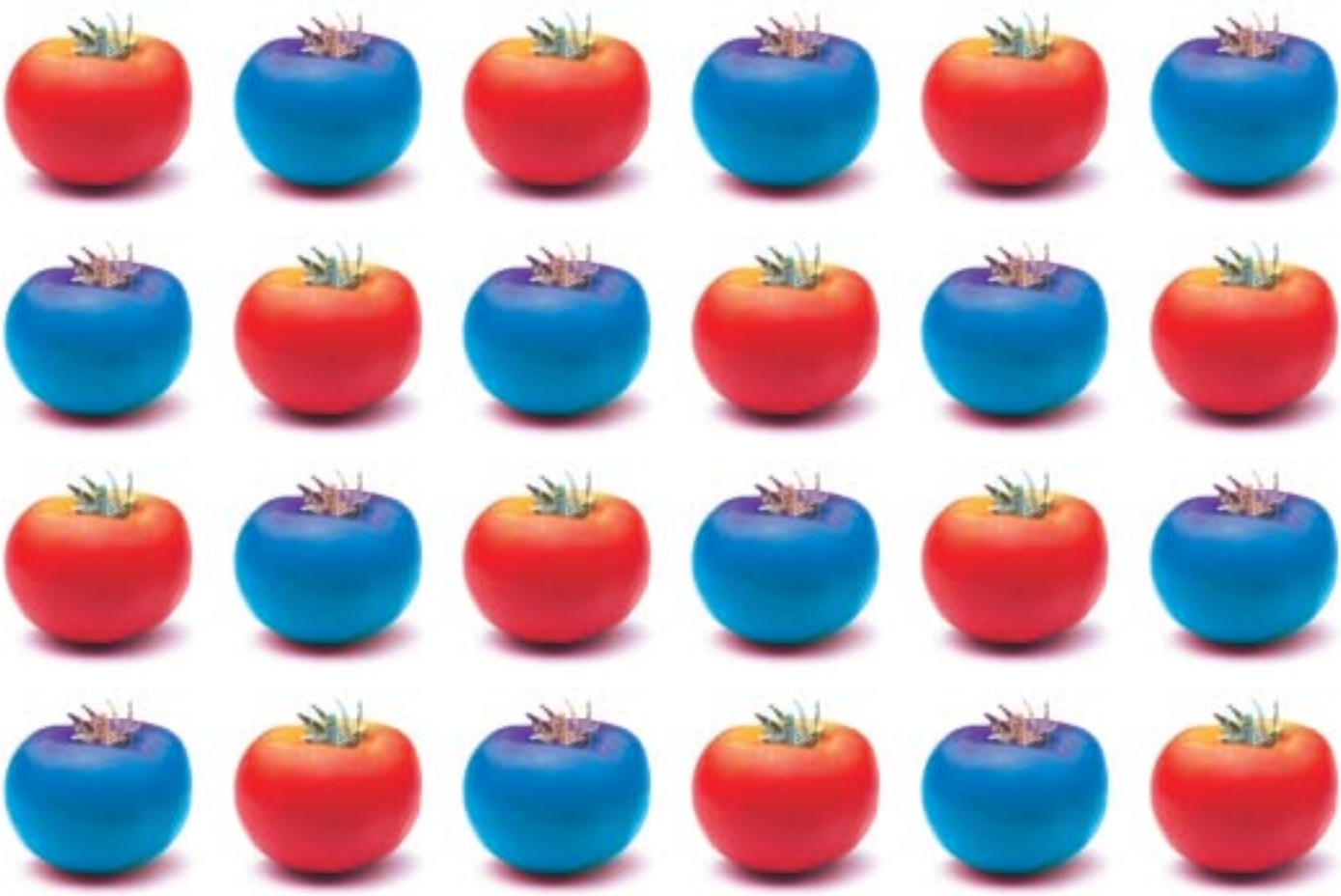

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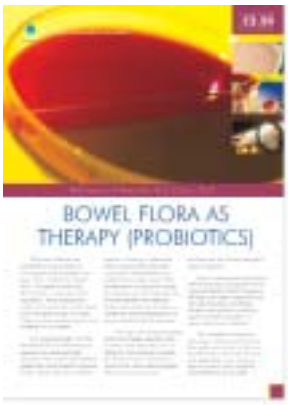

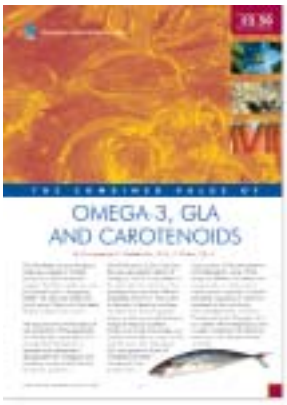

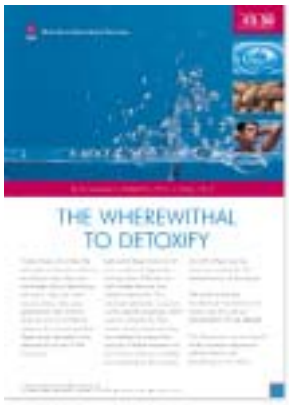

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