WHY DO WE EAT?

An apparently easy question to answer. We eat in order to stay alive. We also eat for pleasure. One can fantasize about various delicious tastes – pork crackling, pêche melba, strawberries and cream, chips, hot asparagus with melted butter, barbecued sardines, etc.

What we eat is a mixture. We eat carbohydrates for energy, we eat proteins and fats, we eat various vitamins. All these enable us to survive and, in general, we in the UK have adequate amounts of them. But there are other items on our menu which are not so well known. These are the micro-nutrients, or trace elements. Do we eat enough of them?

Nutritionists have identified 19 trace elements so far which are essential for our health and have established Recommended Daily Amounts (RDAs) for each. These are copper, zinc, calcium, molybdenum, vanadium, selenium, boron, manganese, magnesium, sodium, chlorine, nickel, fluorine, potassium, phosphorus, iron, chromium, cobalt, and silicon. We do not eat these trace elements as such, we eat them in chemical combination with other elements; examples are calcium carbonate, sodium chloride, etc. But you won't find these essential trace elements on the shelves of the supermarkets. They are contained within other food items which we buy. The trace elements originate as minerals in the soil and are taken up by crops. We then either eat the crops directly in the form of cereals, fruit and vegetables, or indirectly by eating meat or dairy products from animals which have been fed the crops.

So far so good. But what happens when we eat less than the Recommended Daily Amounts? The nutritionists say that would increase our likelihood of developing serious disabling or life-threatening diseases. Each of the 19 essential trace elements has a list of medical problems which can result from not eating the RDA. For example, if you do not consume enough magnesium then you are at increased risk of the following ailments: muscle cramps, tetany, most chronic diseases, loss of appetite, nausea, apathy, weakness and tiredness, numbness and tingling, confusion and disorientation, learning disability, memory impairment, vertigo, convulsions, epilepsy, grimaces, jerks, tremors, flicking eyes, muscular incoordination, insomnia, hyperactivity, constipation, heart rhythm problems, hypoglycaemia, abnormal ECG, osteoporosis, kidney stones and diabetes. Magnesium-rich foods include seaweeds, beans, wholegrains, nuts, seeds and leafy green vegetables. The RDA for magnesium is between 400 and 800 mg per day. And that means every day, by the way. We secrete them merrily so we must injest them merrily, or our whole world would fall apart.

Some of the effects of not eating the RDA are startling. People who have heart attacks are usually found to have extremely poor chromium status. The hair of violent offenders has been found to have low levels of cobalt. So not having the RDA of all 19 essential trace elements can have extremely serious effects on our health. (I am grateful to Helen Cranston, appointed nutritionist to the Good Gardeners' Association, for information on nutrition in this article.)

How are we doing as regards the RDA? Well, not very good for most of them. As an example, on average in the UK we eat 35 micrograms of selenium every day against an RDA of 150 micrograms per day. Therefore we eat a quarter of what we should, so we are more likely to develop cancer, arterial disease and arthritis. There is therefore a national crisis over selenium – and for many others of the 19 essential trace elements. One solution, if we are eating ¼ of the RDA for selenium, is to eat 4 times as much. However, since most people are trying to avoid putting on even more weight, that idea is obviously a non-starter. Another solution is to pop down to the health food store and pop a few selenium pills and other food supplement pills. That sounds like a valid solution, but there are three problems with it:

1. over-dosing is a risk and there may be a conflict with other medication you are taking so you should see your doctor first

2. some trace elements are mutually antagonistic, for example taking a zinc supplement long-term can lead to manganese deficiency

3. some essential trace elements are not available as supplements from health food stores and there may be other trace elements which future research will reveal are essential for our health.

The best way to ensure you have the RDA of all 19 essential trace elements, and other trace elements which may be found in the future to be essential for our health, is to eat food which is naturally in balance and which contains sufficient quantities of the trace elements in the right proportions. In other words, rely on Mother Nature, as we used to do many years ago, rather than take food supplements.

If everyone had the RDA of all 19 essential trace elements the improvement in the nation's health could be dramatic. People would be sick far less often and they would, on average, live happier, healthier and longer lives. There could be simply enormous savings for the National Health Service but, correspondingly, pensions would have to be paid for much longer than hitherto so pension funds would take a big hit.

Eating the RDA of all 19 essential trace elements does not guarantee that you personally will live a longer, healthier life (since you may have an unplanned and unfortunate encounter with that famous No 9 bus) but it would mean that your chances would be improved of living longer and healthier.

Why does our food contain inadequate amounts of these essential trace elements? It once did, but with the "Green Revolution" of the 1940s came a "Green Disaster". Farmers found they could double their crops by applying copious amounts of the fertilisers nitrogen, phosphorus and potash. The farmers abandoned mixed farming, where animal manures (and human manures in some countries) were returned to the fields to fertilise the soil and at the same time also replenish the soil's stock of the essential trace elements. So, ever since the "Green Revolution" the crops removed the 19 essential trace elements from the soil at each harvest and the soil became weaker and weaker in trace elements. The Ministry of Agriculture tested vegetables for 8 trace elements in 1940 and repeated the tests in 1991 – there had been an average reduction in trace elements of 40%, and that rapid impoverishment of the soil must have carried on, year after year since 1991. This situation applies in all countries, so the food we import is also likely to be deficient in essential trace elements. The farmers make more money by applying the magic potion of nitrogen, phosphorus and potash to the land – and our health suffers from the effects of malnutrition in consequence.

So, what can be done? You simply cannot buy food which contains adequate amounts of all 19 essential trace elements even if you are a millionaire. The only way is to grow your own fruit and vegetables in soil which is rich in those 19 essential trace elements and which contains soil micro-organisms to bring the trace elements to the roots of the plants. You, by your own efforts, can obtain what money cannot buy. You can improve your chances of living a healthier, happier and longer life.

Here's how to do it. First of all don't dig, for a reason given later. For a family of 4 you will need a plot of land around 120 feet by 40 feet. If you do not have a garden big enough then apply for an allotment or persuade a local friendly farmer to let you use a tiny part of his land. Then kill off all perennial weeds by stretching an impervious sheet of black polythene over the plot and leaving it in place for 6 to 9 months. Do not use any chemicals. Then rake off dead grass and weeds. In 2/3 of the plot sow seeds of various vegetables directly in the soil and plant out fruit bushes. Cover the remaining 1/3 with well-rotted farmyard manure to a depth of around 3 inches. Young plants such as brassicas, sweetcorn and the marrow family can be planted out in the manured area so that the whole plot will be productive almost from the start. The following year another 1/3 of the plot should receive the manure and so on. Year after year the amounts of trace elements in your soil will be enhanced by trace elements in the manure. The amount of humus in the soil will be greatly increased, the soil texture will be improved and the weeds will come out much more readily. For example, I thus increased the 19 essential trace elements in my allotment soil by a factor of 2.57 and all 19 are now within the Ministry of Agriculture/DEFRA recommended levels.

You must not dig or apply chemicals because of the need to protect precious soil micro-organisms. The roots of crops can take-in trace elements from only up to 1/8 of an inch away, as I have said in a previous article. If the trace elements are further away, say a few feet away, mycorrhizal fungi can nevertheless transport them to the plant's roots. Mycorrhizal fungi are amazing, but since they grow at a rate of only 6 inches per year it is important not to chop them up by digging or to poison them with chemicals – they are our dearest friends. If your soil is very deficient in trace elements, and very deficient in soil mycorrhizal fungi, it will obviously take a few years to restore the situation but persevere, it will be worth it. Further information on this "No-Dig" method of gardening can be found on the website of the Good Gardeners' Association – www.goodgardeners.org.uk.

So, the future health, happiness and longevity of you and your family is in your hands. "Don't-Dig" for Victory!

MIKE MASON