

Dietary Supplementation

There is a case to be made, says **Dr Robert Mann**, for including a few proven supplements.

Three decades ago a brilliant intellectual meteor flashed into sight: the leading American biochemist Linus Pauling's 1968 article 'Orthomolecular Psychiatry' in *Science* put forth a convincing argument that extra vitamins – more than you can get in food – would be expected to improve health, especially mental health.

One reaction in New Zealand was that a leading scientist (Prof R E F Matthews, later FRS) promptly urged the Medical Research Council to solicit research proposals based on this impressive new theory. They didn't and, on the whole, megavitamin therapy has yet to gain respectability amongst reactionary medicos. In the early '70s I gave a copy of 'Orthomolecular Psychiatry' to every Auckland medical student – and was upbraided for wasting resources.

Pauling's aim in that article has unfortunately not yet been taken up much by the relevant experts; medicos generally have ignored Pauling's 'megavitamin therapy' idea - their main reason being, so far as I can see, childish jealousy of one who had no badges in their field.

But actually vitC is by now one of the best-tested medicines. The first famous application of Pauling's megavitamin theory was in prevention of colds and influenza – see Pauling's book 'Vitamin C and the Common Cold'. Dozens of careful studies on thousands of people have proven that about a gram daily of vitC fends off colds & flu markedly; and when one does succumb, the symptoms are milder & briefer.

The few allegations of side-effects, one by a disgruntled ex-employee of Pauling's institute, have not proved credible.

Vitamin E is not so extremely well tested but looks safer than many artificial drugs. Both vitC & vitE are reasonably suspected to inhibit cancer – to prevent to some extent, and to allay some effects when a tumour does get out of control.

Pauling died (at 94) saying the only two vitamin supplements which can be generally recommended are vitC (at dosages in the range 1 – 10 gram/day) and vitE (0.1 – 0.3 g/d *i.e.* 100 – 300 mg/d), which I have been taking for many years. Such dosages cannot be achieved from even the most vitamin-rich foods.

The preferable form of vitC is not ascorbic acid but calcium ascorbate (mail-order around \$60/kg). The proportion of calcium in this salt is just under 10%; therefore 10 g/d calcium ascorbate gives a calcium dosage of less than 1 g/d. If a further gram of calcium daily comes from food, the total is not (so far as I am aware) suspected of supplying excessive calcium, and is indeed what would seem prudent in minimising osteoporosis. I have not heard of any side-effects from 10 g/d calcium ascorbate, whereas those who try ascorbic acid at a gram per day usually get mild diarrhoea.

Prevention is surely the watchword, for osteoporosis even more than most illnesses. It is three decades since I taught what little nutrition was in the Auckland medical course, but I have kept in touch with some aspects of the science and in particular with the generally reasonable leader of the Nutrition Foundation Dr John Birkbeck (rtd).

associate-professor of nutrition, Otago). He quietly desisted some years ago from the mantra (carried on by his successor my namesake – no relation – and by the Consumers Institute) “no vitamin or mineral supplements are helpful for your well-fed Kiwi”. Among the minerals that may be usefully supplemented in New Zealand diets is calcium, especially for those heading into the age-group prone to osteoporosis.

I mix calcium ascorbate powder (one rounded tsp = 4g) in a bowl with a week’s stewed fruit (after cooling) so as to give 1 – 2 g of the added vitamin in each day’s worth of the fruit. I don’t notice any flavour change, and the upset gut usually provoked by any more than 1 g/d ascorbic acid does not occur. Fruit seems to me the accompanying food from which megadoses of ascorbate will be best absorbed. When in the grip of a cold or flu I also take several batches a day of 1 – 2 g simply stirred in orange juice.

I have scrutinised the patents for a more expensive kind of calcium ascorbate deceptively named ‘Ester C’ and as a result have complained to the Director-general of Health. It is extravagant, impure, and possibly dangerous. It also has no apparent connection with any ester. Ms Poutasi is not interested.

On the other hand, an oddly cheap form has now appeared in the supplement shops: ascorbyl palmitate, which *is* on its face an ester. It is claimed to play roughly the role in free-radical scavenging that vitE does, because unlike ionised ascorbate it is of lipoid nature. I can see no reason to act as an unmonitored guinea-pig for this novelty. Just take vitC + vitE.

Prevention is also most surely the watchword for delayed toxicity, which has concerned me generally more than prompt poisoning. The industrial world is failing to cope with many buildups of toxic chemicals and harmful radiations; we know some of these cause cancer, and cancer is now killing around one in three in the overdeveloped world. For all four categories of delayed harm – cancer, mutations, malformations *in utero*, and mental damage – there is no evidence of thresholds (safe doses). I suspect that mental damage is the first to occur as toxic cocktails accumulate in our bodies. Some agents cause delayed illness by producing in our tissues highly reactive transient substances called free radicals. Vitamin C scavenges these nasties. It also does many other kinds of good. A gram a day may not keep the doctor utterly away, but will help. Perhaps the only proven drawback is that those habituated to high dosages of vitC can fail to heal wounds when suddenly on hospital food (*ca.* 80 mg/d vitC).

The other vitamin which can be generally recommended is vitE at 0.1- 0.3 g/d. This scavenges free radicals in the fatty realms of the body as vitC does in the aqueous parts, and is likely to be especially helpful when synthesising new membranes (*e.g.* in recovery from stroke).

These are not my original ideas but those of the late great Pauling. They are all secondary to the good old wisdom of eating a balanced diet, not eating too much, and exercising.

Megadoses of other vitamins may do harm in some minority of persons and can therefore not be blindly recommended. A range of impressive benefits can indeed be had for some from megadoses of, for instance, nicotinamide (vitamin PP), but it cannot be recommended without expert appraisal.

The vitamin folate (sometimes called folic acid) has become deficient or marginal in many New Zealand diets owing to more processing and less fresh greens. Authorities are agreed that about eight cases in New Zealand each year of the crippling malformation known as spina bifida are due to folate deficiency in the mother’s diet just before and early in pregnancy. A solution successful in the USA and Britain is

fortification of bread with folate. New Zealand flour millers were ready to install \$200,000 worth of equipment to meter folate into flour, and pay perhaps half that much annually to run this system, as recommended by the leading medical expert Professor R B Elliott; but Susan Kedgley list-MP has been allowed to obstruct this good move, on the ground of "choice". Elliott & I also consider that there is sufficient evidence to warrant our taking a few hundred microgram daily of folate to inhibit heart attacks.

Amino-acid supplements are generally not useful - and can contain lethal impurities, especially in the era of manufacturing them by gene-jiggering:
<http://www.connectotel.com/gmfood/trypto.html>

As for minerals, iron-deficiency anaemia is second only to obesity in statistical frequency among nutritional disorders in the overdeveloped world. Potatoes are rich in iron (and, surprisingly, in vitC), so even those who shun the meats which are the famous source of iron need not resort to pills. And anyway, iron is poorly absorbed from pills. Kiwi diets are suspected of being generally deficient in selenium, another free-radical scavenger which can be supplemented around 50 microgram (*i.e.* 0.05 mg) daily.

Nutrition supplements remain a neglected science but are becoming a vigorous trade with many ill-founded claims. I believe this note contains much of what little is known on this neglected topic.

Dr Mann, a biochemist, served for its first dozen years on the Toxic Substances Board advising successive New Zealand Ministers of Health on poisons.