

**Millions in the West are malnourished.
You're probably one of them**

**The modern diet is so low in nutrients
that even a balanced diet can't provide
all the micro-nutrients we need**

**Malnutrition impairs the body's natural
defences which guard against common
degenerative diseases like cancer,
arthritis and heart disease**

**Modern medicine attacks disease
'from the outside' – often causing side
effects. Nutritional therapy enhances
the body's natural defences and is the
strongest and safest form of
preventative medicine**

Breast cancer risk

The risk of breast cancer may be increased as much as tenfold by a diet depleted in Vitamin E and the mineral selenium. Isoflavones and the carotenoid lycopene are also important; see Chapter 13, Fighting cancer with food.

Chapter 2

Malnutrition – the biggest killer in the West?

For most people, malnutrition means TV images of emaciated figures from the Third World. But malnutrition also occurs closer to home: not the acute lack of calories that can kill within weeks but a chronic depletion of micro-nutrients such as vitamins and minerals, essential fatty acids and certain other substances such as dietary fibre. These

chronic shortages may not cause obvious short-term effects, but they nonetheless leave a legacy of lasting ill-health and premature death.

The victims aren't necessarily underweight. They could be (and often are) overweight. They may look the picture of health, but meanwhile, some section of their metabolism is going subtly awry, or one of the body's defence systems is beginning to fail. There may be no warning signs until one day a chest pain, a positive cervical smear, a broken bone or loss of vision reveals that something has gone terribly wrong.

There are genetic factors involved, and also environmental elements, such as exposure to pollutants like tobacco smoke – but malnutrition is the key. For example, cataracts are far less likely if you take the right anti-oxidant vitamins and flavonoids; whereas the incidence of heart disease is much higher in people who eat a lot of sweet and starchy foods, but don't eat much oily fish, and whose diet is low in anti-oxidant rich fruit and vegetables.

WHY DISEASE STRIKES : Malnutrition

A few diehards maintain we get everything we need in a balanced diet. An eminent UK professor made a notorious speech only a few years ago, saying that the only effect of vitamin pills was expensive urine.

Ironically, it was a research team from his own hospital which subsequently proved that folic acid supplements given to pregnant women reduced the risk of spina bifida babies.

Babies, in fact, are particularly well catered for. Read the list of ingredients on any box of baby food, and you'll see that manufacturers pack their products with as complete a range of vitamins and minerals as they can. But for older consumers, who need just as many micro-nutrients (and, in many cases, more), it appears that the food industry couldn't care less.

Over-processed foods, convenience foods, depleted soils, prolonged food storage and inappropriate cooking techniques mean that the vast majority of us do not get enough of a whole range of micro-nutrients. British and American Government surveys have borne this out. Study after study has shown the need for the beneficial effects of supplements – and conversely, the damaging effects of the average diet.

As a result, there has been a dramatic turnaround in the opinions of medical experts. Dr Tom Saunders, Professor of Nutrition at King's College, London, believes it is almost impossible to select a diet which supplies every nutrient needed for health.

A consensus statement, issued in 1997 by the Department of Human Nutrition at Utah State University, declared that it is now impossible for women to obtain their Recommended Daily Allowances (RDAs) for all vitamins and minerals from the average American diet.

In 2002, Professor Walter Willett, who chairs the Department of Nutrition at Harvard School of Public Health, created a new

A TYPICAL BABY FOOD PACK

NUTRITION INFORMATION TYPICAL VALUES		Per 100g Powder	(% I.R.V.)	Per 100g as fed*	(% I.R.V.)
Energy	kJ	406		432	
	kcal	429		107	
Protein	g	12.3		3.1	
Carbohydrate	g	66.7		16.7	
of which sugars	g	29.9		7.5	
Fat	g	12.5		3.1	
of which saturated	g	5.6		1.4	
Fibre	g	1.8		0.5	
Sodium	g	0.1		0.09	
Vitamin A	µg	450	113	119	28
Vitamin D	µg	19	100	2.5	25
Vitamin E	mg	4.0		1.5	
Vitamin C	mg	30	120	7.5	30
Thiamin	mg	0.5	100	0.15	25
Riboflavin	mg	0.9	115	0.25	28
Niacin	mg	9.0	100	2.3	25
Vitamin B ₆	mg	0.8	114	0.2	29
Folic Acid	µg	100	100	25	25
Vitamin B ₁₂	µg	0.7	100	0.18	25
Calcium	mg	470	118	120	30
Iron	mg	7.0	117	1.8	29
Zinc	mg	4.0	100	1.0	25

*when reconstituted as directed.
I.R.V. Labelling Reference Value for infants and young children.

Irresponsible?

The food industries produce many foods which are nutritionally shoddy and responsible for much ill health.

What if the petro-chemical industry sold fuel so poor it wore out car engines long before their life span? Wouldn't there be an outcry?

For example, trans-fats and excessive sugar, starch and salt are responsible for many cases of heart disease and stroke – yet the food industry continues to produce foods containing far too much of these cheap ingredients, and far too few micro-nutrients

It's irresponsible; and consumers pay the price.

WHY DISEASE STRIKES : **Malnutrition**

Degenerative diseases are the First World killers

Because the degenerative diseases are mostly diseases of affluence, they are relatively uncommon in the developing countries.

In the Third World, most people still die of infectious diseases or trauma, although tobacco-related cancers and heart problems are increasing.

All over the world, however, death is generally hastened by diseases with predominantly social causes.

Just as Third World death rates could be slashed by improved sanitation, vaccination programmes, better food storage, fairer land allocation, and restrictions on cigarette advertising, so Western health could be radically improved by a little social tinkering, more sophisticated agricultural policies, improved nutrition, and better health education.

'food pyramid' which for the first time includes supplements as essential dietary components.

Supplementary benefits

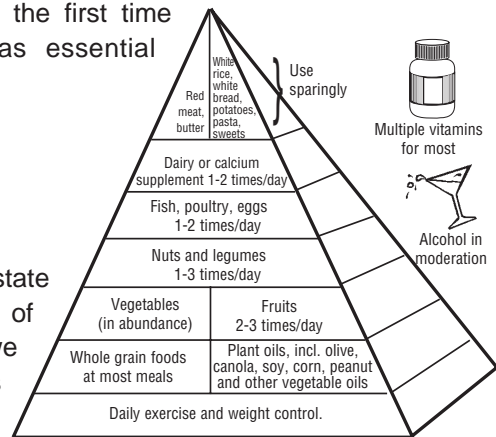
Many scientists who still state in public – as a result of peer pressure – that we don't need supplements acknowledge, in private, that they take them themselves. Their decision to take supplements is

based on a substantial body of trials which have demonstrated the benefits of taking additional vitamins and minerals. The American Physicians Trial, the Zutphen Trial, the University of California Trial, the Basle Study, the Beijing Trial, and many more have shifted the balance of evidence to the extent that the pro-supplement team no longer have to prove that supplements can help your health.

In fact, I would say that you're gambling with your health if you **don't** supplement. Because ... whether we like it or not, we're all guinea pigs.

We are all taking part in a vast, unplanned dietary experiment with unknowable long-term consequences. Our diet has changed beyond recognition from the hunter-gatherer type food that we evolved with, and on which our metabolism was designed to run. And the process of dietary change has speeded up considerably since the end of World War II. That's mainly due to the multinational food processors and distributors who have a financial interest in selling processed, and value-added (but often micro-nutrient-depleted) products.

Another 'experimental' factor is the creation of new environmental pollutants in the water, the air and the food chain (the American Chemical Society recently announced the synthesis of the 10 millionth new chemical).



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It's not an experiment in any scientific sense. It's not controlled. No-one is in charge. But the limited amount of information that we do have suggests we may be laying the seeds of health problems to come which can only be made worse by the general greying of the populations of the Western countries. In short, we may be looking towards a huge increase in degenerative diseases. Some of the most recent surveys of public health suggest that this trend may already have begun⁽⁵⁷⁾.

Who is at risk?

Various activities or conditions can either increase our requirements for micro-nutrients, or reduce the body's ability to absorb them from food.

Dieters	When food intake is reduced, the intake of micro-nutrients is also reduced; and yet the body's requirements for certain vitamins and minerals may actually increase during periods of weight loss. Anorexics and bulimics are also at increased risk of multiple micro-nutrient deficiency.
Smokers	Each cigarette uses up large amounts of Vitamin C and other anti-oxidants, which is one reason why smokers are more vulnerable to heart disease and cancer.
Drinkers	Too much alcohol depletes the body of B vitamins, and the minerals zinc, magnesium and calcium.
Athletes	Heavy exercise burns more oxygen and therefore increases the requirements for anti-oxidants. Large quantities of zinc and other minerals can be lost through perspiration and need to be replaced.
Sun-worshippers	Too much sun uses up anti-oxidants. If you take Vitamins A, C and E and increase your carotenoid and flavonoid intake, your skin will be better protected against the ageing effects of ultra-violet radiation.
Vegans and vegetarians	Need to plan their diets carefully. Vitamins at risk include D and B12.
The Pill	Oral contraceptives are thought to increase the need for folic acid, Vitamins B and C, and zinc.
Accidents, illness and surgery	All increase the need for vitamins and minerals, including calcium, zinc and magnesium and Vitamins A, B, C and E.
Pregnancy and breast-feeding	The metabolic demands of providing for a growing child increase the need for B complex vitamins, folic acid, Vitamins A D and probably E, and minerals such as iron, calcium and magnesium.
Post-menopausal women	Need more calcium, magnesium and other minerals to save their bones, and Vitamins A, D, B, C, E and K. Other vegetable-derived compounds are important too.
The elderly	Digestion is less efficient in the elderly, who generally have multiple micro-nutrient depletion. A properly designed multi-vitamin and mineral programme is strongly recommended in the over-60s.

WHY DISEASE STRIKES : **Malnutrition**

Micro-Nutrient Depletion Symptom Checklist

Depletion of some micro-nutrients such as Vitamins E and K and the minerals selenium and magnesium are difficult to spot until, eventually, some serious illness develops. Lack of other nutrients can be detected early, because there are often obvious depletion symptoms.

SYMPTOM	POSSIBLE LACK OF
Cracking at corners of mouth	iron, folic acid, Vitamins B2 & B6
Recurrent mouth ulcers	iron, folic acid, Vitamin B12
Dry, cracked lips	Vitamin B2
Cracked tongue	Vitamin B3
Red/sore taste buds at tip of tongue	Vitamins B2 or B6
Bruising/enlargement of veins under tongue	Vitamin C
Red, greasy skin on face, esp. side of nose	Vitamins B2, B6, zinc, EFAs (essential fatty acids)
Rough, red or pimply skin on thighs and arms	Vitamin B complex, Vitamin E, EFAs
Scrotal and vulval dermatitis	Vitamin B2, zinc
Eczema, dry rough cracked skin	zinc, EFAs
Poor hair growth	iron or zinc
Bloodshot or gritty eyes	Vitamins A, B2
Night blindness	Vitamin A or zinc
Dry eyes	Vitamin A, EFAs
Brittle or split nails	iron, zinc or EFAs
White spots on nails	zinc
Pale, anaemic	iron, Vitamin B12, folic acid
Restless legs at night	iron, folic acid
PMS (pre-menstrual syndrome)	zinc, magnesium, Vitamin B6
Gingivitis/gum disease	co-enzyme Q10 and other anti-oxidants
Low energy	many nutrients, including Co-enzyme Q10

Many of the above problems can be caused by other medical conditions or by certain medications. If symptoms are severe or persistent, consult your doctor.

From S Davies & S Stewart *Nutritional Medicine*, Pan Books 1987

Victims of affluence

The human body is incredibly resilient, and can take a good deal of punishment. We can survive injury, infections and periods of starvation; we can even go without water for a few days. With luck cuts heal, broken bones mend, and the stomach upset brought on by unwise eating fades away after a few days.

It's hardly surprising that our immune defences and self-repair systems are so good – after all, we evolved in a tough and unforgiving environment. Our Stone Age ancestors had to get by without the social security, intensive medicine and post-traumatic counselling we take for granted.

What we have to fear is not so much the hard times, but the good times. We have become the victims of our own affluence, and the comforts that we depend on are the very things that make us ill.

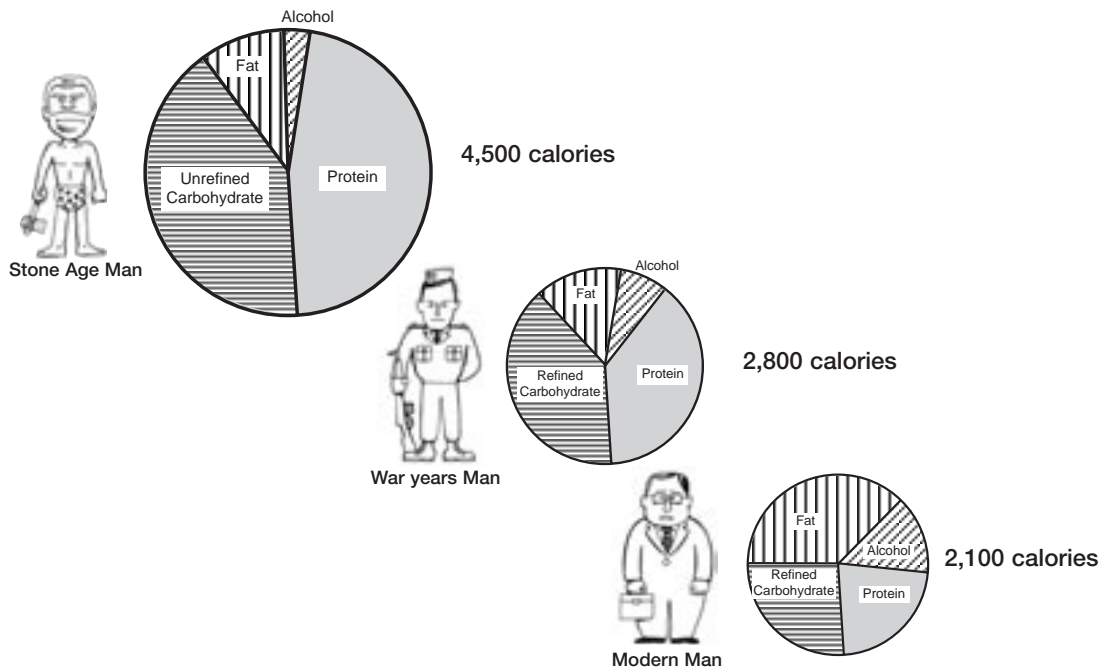
The horsemen of our apocalypse are no longer war, famine and plague, but cigarettes, hamburgers, chips and the motor car.

The universal diet

The consensus is that the anti-heart disease diet, the anti-cancer diet, the anti-diabetes diet and the anti-obesity diet are all the same – ie: we should be eating more fruit, vegetables, whole-grains, nuts, beans and pulses; and less saturated fats, sugars, starches and salt.

To that I would add well-designed supplements.

Estimated % of calories by source – from Stone Age to Present Day



WHY DISEASE STRIKES : **Malnutrition**

Vitamin C leads to a longer life?

Recent studies indicate that people who take Vitamin C supplements live longer^(3, 56).

Like all research, interpretation and other factors are important. Such people are likely to be more health conscious generally, eg. eat more fruit and vegetables, take other supplements and exercise.

Nevertheless it seems that people with high levels of Vitamin C generally have lower blood pressure and, since Vitamin C helps prevent the oxidation of cholesterol, they are, therefore, less vulnerable to strokes and heart attacks. Vitamin C also seems important in reducing the risk of many forms of cancer.

We are, of course, more than just what we eat, but conversely the foods we eat and the supplements we take have a profound influence on whether we live out our allotted life spans, and in what sort of health.

The heart of the problem is that we have moved too far away from our evolutionary origins. I'm not recommending a return to a hunter-gatherer diet of roots and grubs. I'm partial to many of the luxuries our society affords – I like Chinese restaurants, the cinema, good design and better ice cream. When I get a headache I take paracetamol or ibuprofen.

But we didn't evolve with central heating, or junk food. Our ancestors had no knowledge of tobacco, and they ate proportionately less fat, and little sugar or salt. If they wanted to eat at all, they had to do a certain amount of physical work to get the food. These are the conditions that formed us.

In marked contrast we take too little exercise, we smoke too much, we eat too many calories in the form of rich, processed foods, and we don't get enough of the vital micro-nutrients that many of these same processed foods are so deficient in. And so, slowly, things go wrong. Our organs begin to fail, cells run out of control and then, gradually, our health begins to suffer.

We're born with an incredible gift, this vastly complex physical body which acts as a house for our genes and our central nervous system. We maintain our cars and our homes, but we neglect our bodies – and yet they're much more difficult to repair, and spare parts are rare!

WHY MICRO-NUTRIENTS ARE VITAL

Good nutrition encompasses everything we eat. Proteins, fats and carbohydrates are the main elements used by the body for growth, tissue repair and energy. The vitamins and trace minerals act mainly as catalysts. They are essential in helping the body's metabolism to regulate all the thousands of chemical reactions that keep us alive.

Think of the micro-nutrients as a kind of specialised oil, keeping the machinery turning. A lathe or pump doesn't need much oil but if you skimp on the lubrication, the machinery soon starts to wear out and will eventually break down. If you don't get enough essential vitamins and minerals in your diet, then eventually your health will break down too. Multiple micro-nutrient depletion is probably the leading cause of ill-health and premature death in the West.

The global diet

According to a recent World Health Organisation (WHO) report, Irishmen and Scotsmen are three times more likely to die of coronary artery disease than their French counterparts.

Their partners are even worse off: women in Belfast or Glasgow are nine times more likely to die of a heart attack than their French sisters. In fact, British women are at the top of the International Ladies' League Table of Heart Attacks, and British men are in the number one position in the male league.

The fact that Aberdonians are so much more at risk than the citizens of Toulouse is known as the French Paradox. French cuisine, after all, is at least as rich as Scottish food. A diet replete with full fat cheese, cream and pâté de foie gras is not at all what the doctor ordered – and yet the French seem to be able to get away with it.

The relative immunity of the French is due to various components in their diet, including the mono-unsaturated fatty acids (and flavonoids) in olive oil, the flavonoids in red wine, and other anti-oxidant compounds such as lutein in kale and other green leaf vegetables^(21, 22) and lycopene in tomatoes^(25, 26).

In terms of other diseases, however, such as breast and prostate cancer, the French don't do nearly as well as the Koreans, who seem to be protected from these illnesses due to their high consumption of soy products (see Chapters 6, Plant magic, and 13, Fighting cancer with food). And in African cultures where a high fibre diet is still consumed, the incidence of colon cancer is far lower than it is in the USA – or, for that matter, in France and Britain (see Chapter 7, Pre-biotic Fibre).

Every country and every culture has its own strengths and weaknesses. If we could take the good from each one, we could assemble a diet that would enable far more people to live long and healthy lives, and to reach their biological potential.

The charts that follow show some major national and regional differences. What is it about the lifestyle and diet of Morocco (for example) that results in an 80% lower rate of heart attack than, for example, the UK and Finland?

The best of the best

The common demoninators of the food intake in countries with low cancer, heart attack and stroke rates are high levels of:

- fruit and vegetables
- oily fish
- soy products
- fibre
- pulses, beans and chick peas
- nuts
- olive oil
- red wine

And low in:

- processed food

Pick of the planet



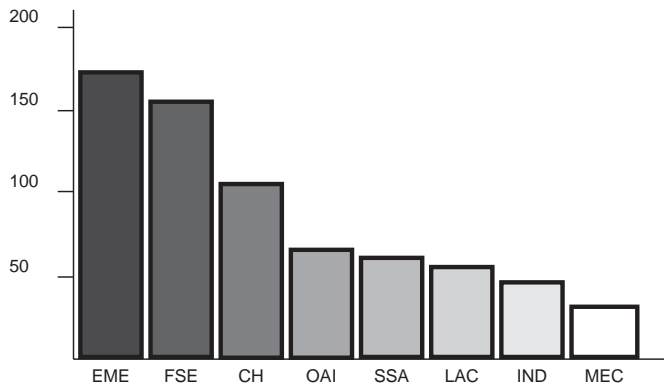
Moroccans have a heart disease rate that is one fifth of the UK. Their diet is high in dried fruits, pulses, vegetables and olive oil – ie high in flavonoids and mono-unsaturates.

WHY DISEASE STRIKES : **Malnutrition**

These are the data and the issues on which I base my belief that you can minimise your risk of heart attack, stroke, cancer and many other diseases with the right lifestyle and nutritional supplements.

WORLDWIDE CANCER DEATH RATES PER 100,000 DEATHS

DATA FROM WHO



EME = Established Market Economies

FSE = Formerly Socialist Economies

CH = China

OAI = Other Asian countries and islands

SSA = Sub-Saharan Africa

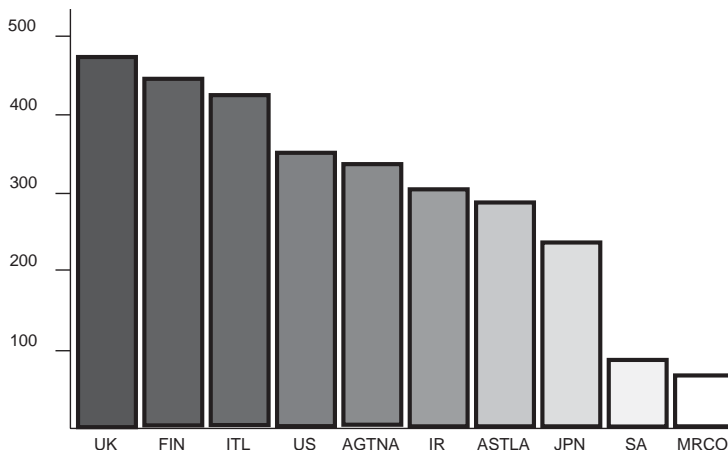
LAC = Latin America & Caribbean

IND = India

MEC = Middle Eastern Crescent

COMPARATIVE DEATH RATES FROM HEART DISEASE BY SELECTED COUNTRIES PER 100,000 DEATHS

DATA FROM BRITANIA YEAR BOOK 1997



UK = United Kingdom

FIN = Finland

ITL = Italy

US = United States of America

AGTNA = Argentina

IR = Iran

ASTLA = Australia

JPN = Japan

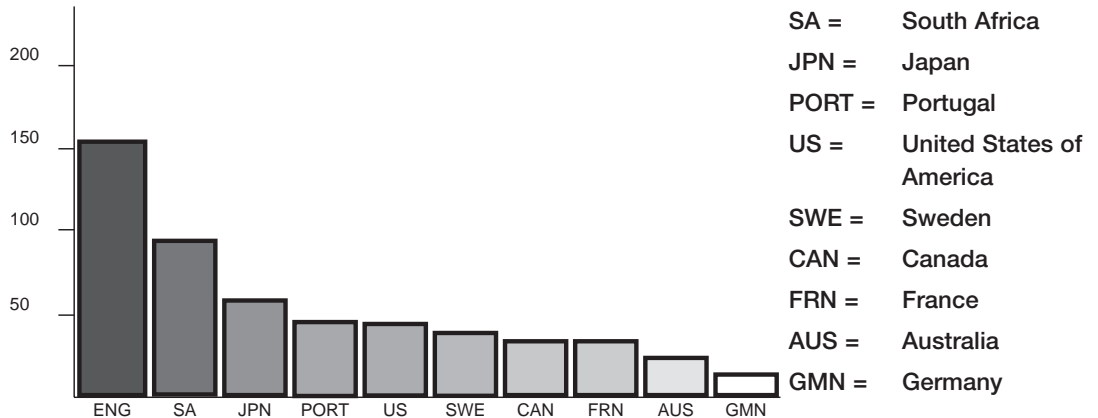
SA = South Africa

MRCO = Morocco

WHY DISEASE STRIKES : Malnutrition

COMPARATIVE DEATH RATES FROM STROKES BY SELECTED COUNTRIES PER 100,000 DEATHS

DATA FROM CANADIAN HEART/STROKE ASSOCIATION

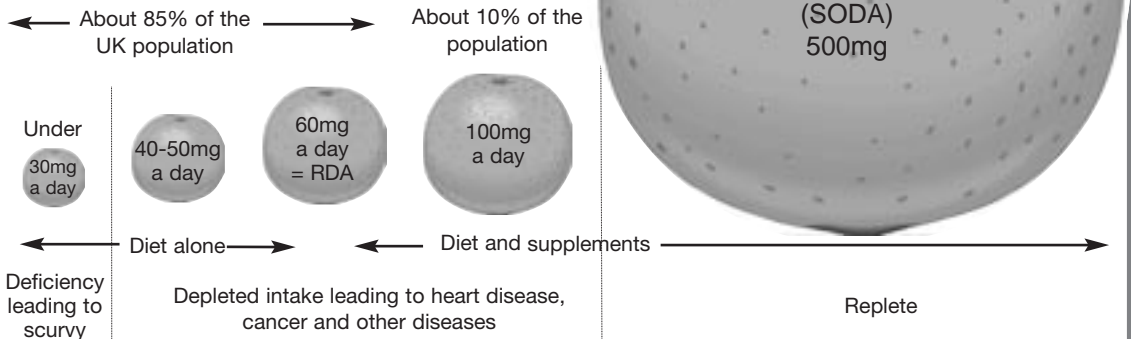


- ENG = England
- SA = South Africa
- JPN = Japan
- PORT = Portugal
- US = United States of America
- SWE = Sweden
- CAN = Canada
- FRN = France
- AUS = Australia
- GMN = Germany

VITAMIN C INTAKE

The term 'deficient' is traditionally used by nutritionists to describe the situation where a micro-nutrient in the diet is so low that a characteristic 'deficiency' disease appears, such as scurvy in those lacking Vitamin C.

We now know that long before a *deficiency disease* like scurvy appears, our cells and organs are already being damaged, increasing the risk of long-term health problems, such as coronary artery disease ^(5,16,17). This condition is known as *depletion*, and is far more common than deficiency.



The food failure

We don't get enough of all the things we need in our food, no matter how carefully balanced our diets. Many major surveys have confirmed that the vast majority of us are depleted in many, if not most, key micro-nutrients⁽⁴³⁾.

The main reasons for this micro-nutrient shortfall (low energy lifestyles, dietary shifts, ageing populations, etc.) have already been outlined. There are only two possible solutions.

The purist solution

We take more exercise; walking to work rather than driving, using the stairs rather than the lift, switching from TV and sedentary forms of relaxation to regular sporting activity, whether swimming, football, or line dancing. This will increase our calorie requirements, enabling us to eat more food containing more micro-nutrients.

The convenience solution

We continue with our current low-energy lifestyle, but eat a more micronutrient-rich diet. This can be achieved by opting for 'functional foods', or taking supplements. Some consumers choose organic fruits and vegetables, although there is no evidence that these contain higher amounts of the vitamins and minerals (although see Chapter 5, Anti-oxidants).

In fact the old idea of eating more vegetables being the best way to obtain micro-nutrients has to be re-examined: absorption of carotenoids from green leaf vegetables is not good, and certainly not as good as from supplements⁽⁶⁾. A second trial came to a similar conclusion: the bioavailability of beta carotene when consumed as carrots, the traditional food source, is only a third as good as beta carotene in supplements⁽⁶⁾. Beta carotene in certain fruits like mangoes is stored differently from the way in which it is stored in vegetables, and is more easily absorbed⁽⁷⁾. Unfortunately, mangoes are not as widely eaten as carrots!

Folic acid depletion increases the risk of heart attacks and spina bifida babies. Eating a 'better' diet has little effect on blood folate levels – whereas folate supplements do^(4, 33). Supplements are better absorbed and more stable^(28, 37); stale vegetables contain very little folic acid anyway.

Less nutrients – more need

Our intake of micro-nutrients is dwindling. At the same time our requirements for micro-nutrients are growing. Elements in our lifestyle (exposure to sunlight, cigarettes, pollution, air travel and, for some, excessive exercise) increase the need for vitamins and minerals, including the anti-oxidants.

Fortified foods

Many breakfast cereals contain six to eight added micro-nutrients, and there's good evidence that eating breakfast cereal does improve nutritional status. Professor Malcolm Crawford at the Institute of Human Nutrition at the Hackney Hospital in London showed that the risk of a mother having a baby with cerebral palsy (which is increased by foetal malnutrition, caused by maternal malnutrition during pregnancy) is reduced if she regularly eats breakfast cereal^(45, 46).

But six to eight essential micro-nutrients out of a total which may be more than 50 is far from perfect; and the doses the manufacturers include, usually expressed as fractions of the Recommended Daily Allowances (RDAs), are stingy and out of date.

Why don't doctors tell you these things?

The Magic Bullet trap

Nutrition is not taught at medical school, other than a paltry six hours of lectures in a five- or six-year course. This is one reason why many doctors have not until recently been interested in nutrition – they simply don't know much about it. Indeed, many of them find it difficult to cope with patients who may know more about vitamins and minerals than they do.

However, the situation is improving. Even if doctors don't read the women's magazines laid out on their own waiting-room tables (a mine of information regarding the latest health findings), most of them do read specialist medical journals. And in the last few years these journals have begun to publish articles on the health benefits of anti-oxidants and other micro-nutrients. This explains why an increasing number of doctors are becoming interested in nutrition and beginning to change their attitudes.

But don't underestimate medical conservatism. For every doctor who takes vitamins, there are many more who think the whole thing a waste of time and money. There are even some medical scientists who still maintain, against all the evidence, that supplements are a 'con'. This is not due to medical ignorance, but to medical and pharmaceutical bias.

Depletion is widespread

B Vitamin depletion is extremely common, and is a significant cause of coronary artery disease^(8-10, 18-21).

Other vitamin and mineral depletions appear to be common, even in well-to-do communities^(11-17, 23, 24, 27, 28, 38-40, 42), where vitamin and mineral supplements routinely produce improvements in immune function and health.

The picture is clear: many of us are not getting enough of the micro-nutrients we need to live an optimally healthy life.

Supplements are an easy way of rectifying that problem.

Post-graduate approved

Courses in Pharmacology and Nutrition are now established at the Royal College of General Practitioners in London, as well as a BSc Hons course at the University of Middlesex.

WHY DISEASE STRIKES : **Malnutrition**

Friendly fire and vicious circles

Painkillers, ironically, can cause gastro-intestinal pain and ulceration. Anti-ulcer drugs can cause impotence. One widely used treatment for impotence (pre Viagra) can cause structural damage to the penis, leaving its owner permanently incapacitated.

The therapies used in the so-called war against cancer, which is where the front-line action is hottest, are the most debilitating, painful and disfiguring treatments of all. Iatrogenic illness (the side effects of drugs) is now the fourth leading cause of death.

Does it have to be this way? Probably not. In the view of many who study degenerative disease and the ageing process, nutrition could provide kinder answers.

An ounce of prevention is better than tons of cure, particularly in medicine. Protection against degenerative diseases is increasingly being seen as a matter of getting the nutritional balance right.

One cause of bias is the fact that most medical research depends on finance from pharmaceutical companies. These companies make their money from designing new drugs, based on novel compounds which they can patent and sell at good margins. They cannot afford to support unprofitable research into nutrients which cannot easily be patented. And because most medical research is restricted to testing new drugs, this moulds the way many doctors and medical scientists think. They don't think in terms of nutrients – they think in terms of developing newer and ever more sophisticated and expensive drugs.

I trained as a medical scientist, and I'm not against modern medicine. This century has seen many medical triumphs, and the pharmaceutical industry's development of new drugs continues to make an important contribution.

For example, Salvarsan, an arsenic compound known as the first 'magic bullet', killed off syphilis in the sense that it was no longer a fatal punishment for 'sexual sin'. After Salvarsan, and the anti-biotics which followed, syphilis became just another illness which could be easily treated.

However, the very success of the first antibiotics, and the early hormone replacement therapies such as insulin, became a trap, setting limits to medical thinking. Doctors became obsessed with magic bullets – obliterating or killing the disease was the order of the day. Look through the medical literature and you'll see that metaphors of war and struggle are still prevalent.

But when doctors wage war on disease, patients can be in as much danger from 'friendly fire' as they were from the original disease. In countries such as the USA, as many as 15 per cent of hospital beds are occupied by patients suffering from iatrogenic illness – illness caused by the side effects of their medications.

Bullets, even magic ones, are based on a fundamentally destructive idea. This may be wholly appropriate when dealing with an invading micro-organism, but in other illnesses an easier alternative for the patient may well be to encourage his or her own powers of recuperation.

Degenerative diseases are the end stages of a slow deterioration caused by some mechanism being tipped off balance.

For example, coronary artery disease develops when the rate that fats are oxidised and deposited in the artery walls is consistently greater than the rate at which the body can remove them.

Osteoporosis develops when the rate of calcium loss from bone is consistently greater than the rate at which the body can replace it.

A cancer grows when its ability to multiply overruns the normal limits to cell growth, and the checks of the immune system.

Problems arise when we overload or undernourish the body's natural defence mechanisms – even by a small margin.

A slight negative imbalance, if continued for many years, will eventually lead to trouble 20 or 30 years down the line. And our self-destructive lifestyles do just that: they tip the balance away from self-repair, and towards gradual self-destruction.

The good news is that minor dietary and lifestyle changes can redress those potentially lethal but marginal imbalances, tipping them away from illness and towards prolonged good health. Accentuate the positive, eliminate the negative, and you too can look after Mr (and Ms) In-between.

Accentuating the positive means increasing your intake of a range of vital micro-nutrients and taking a bit of exercise.

Eliminating the negative means kicking the cigarette habit, cutting down on fats and sugars, trimming the amount of salt you eat, and drinking no more than moderate amounts of alcohol (although up to half a bottle of red wine a day appears beneficial, see Chapter 6, Plant magic).

It's a small price to pay for a long and healthy life.

My general approach, and the main theme of this book, is that nutritional therapy is usually the best (preventative) form of medicine. It gives the body a gentle and precise helping hand by boosting its own internal repair mechanisms, rather than attacking disease from the outside as drugs generally do.

Research shows that the nutritional approach can work wonders. It can dramatically reduce the risk of heart disease; it can open blocked arteries, improve a failing immune system, speed up the body's ability to heal wounds. It can increase energy, raise intelligence, boost the sex drive. And it can do more. Life extension is no longer over the horizon. It's here.

Our in-built repair kit

The processes of bodily repair are constantly active. They have to be – if we didn't grow new cartilage, our joints would seize up before we reached middle age.

If we didn't have a self-clearing mechanism in our arteries, they would fur up and block before we left our teens.

If we didn't have guard cells to spot and kill off tumour cells before they could become a threat, we'd all die of cancer at a very early age.

The fact that this doesn't often happen is a testimony to the body's ability to police, repair and regenerate itself.

Mr Micawber

"Annual income twenty pounds, annual expenditure nineteen pounds, nineteen and six, result happiness. Annual income twenty pounds, annual expenditure twenty pounds nought and six, result misery."

from 'David Copperfield' by Charles Dickens

WHY DISEASE STRIKES : **Malnutrition**

Why prevention is better than cure!

Some of the most common treatments can have undesirable side effects:

Anti-depressants can cause nausea, headaches and insomnia.

Antibiotics also kill the healthy gut bacteria and, worryingly, are leading to drug-resistant super-bugs.

Decongestants may increase the risk of strokes.

Nutritional therapy

Nutritional therapy is about the safe, gentle and specific mending of tissues by encouraging the body's own repair processes.

The results are being verified by an initially sceptical, but increasingly enthusiastic scientific establishment.

EMERGENCY NUTRITION

The nutritional approach is generally slow-acting, because self-repair is slow. It's not often suited to emergency medicine; although even here it has its uses.

The death rate from acute pancreatitis has been cut from 90 per cent to 5 per cent with Antox, which contains anti-oxidant vitamins and the mineral selenium⁽²⁹⁻³²⁾. These results are so dramatic that in future all GPs will probably be required to carry a supply of Antox in their black bags.

Co-enzyme Q10 is a micro-nutrient widely used to treat gingivitis and raise energy levels. But in the USA, Japan and Italy, it is a licensed medicine used to improve cardiac function in patients with heart failure – see Chapter 9, Q10 and L-carnitine.

Good health and long life – the simple answer

The literature on nutrition has grown into a forest of information, and one which is becoming increasingly difficult to hack through. But if you're interested in the idea of living a long and healthy life, the way ahead is actually quite simple. It starts with four recent key research findings: together, they provide most of the information we need to increase our life expectancy and decrease the risk of illness.

1 Healthy at 100 years old

A recent investigation set out to find out just what makes a healthy centenarian. There aren't too many healthy hundred-year-olds about, but a dedicated team of scientists combed Italy in search of these paragons of health and long life, and eventually found 37 people who fitted the description. After clinical investigations, they concluded that one thing that all these healthy pensioners had in common was an effective immune system⁽¹⁾.

That makes sense, because it's the immune system which protects us against infections, cancer, and other diseases. To find a healthy immune system in people so old was surprising, because it is well known that the immune system declines with age and becomes less effective.

This is why the elderly are more prone to infections, and why they take longer to recover. It is also one reason why the risk of cancer increases in old age. But why does the immune system run down?

2 Good nutrition

Professor Ranjit Chandra at the Johns Hopkins University in Baltimore believed that the cause of the weakened immune system so common in the elderly was not old age, but the depletion of the minerals and vitamins that the immune system needs to work effectively.

His elderly subjects were indeed found to be deficient in many key nutrients, and their immune responses were correspondingly below par. He gave them a daily nutritional supplement. Within 12 months their immune systems had recovered. Moreover, their days off sick were reduced by an amazing 50 per cent⁽²⁾, a finding since replicated by other researchers⁽¹²⁾.

3 Anti-oxidants

A second study of the healthy Italian centenarians found that in addition to their strong immune systems, they all had good anti-oxidant defences, with both of these advantages due to their excellent diet⁽³⁶⁾.

4 Good health at any age

As we have seen, by the time we get into our sixties, a staggering five out of six of us have one or more of the chronic diseases: heart disease, diabetes, arthritis, cancer or osteoporosis. This is a damning indictment of our unhealthy lifestyles, and much of the blame can be laid at the door of poor nutrition.

How can we support such a claim? Because extensive work by Professors Emanuel Cheraskin and Warren Ringdorf⁽⁵⁸⁻⁶⁰⁾, at the University of Alabama Medical College, found that the one thing that was different about the one in six who stayed healthy at age 65 and beyond, was that they consumed more vitamins and minerals.

Healthy old age

Studies show:

- 1) The common denominators in healthy 100-year-olds are a healthy immune system and good anti-oxidant defences.
- 2) When elderly people were given vitamin and mineral supplements their weakened immune systems recovered and their anti-oxidant defences improved.
- 3) The 20% of people aged 60 and over who **don't** have heart disease, arthritis, cancer, diabetes or osteoporosis consume more vitamins and minerals.

What is our diet depleted in?

A few examples ...

- Vitamin C; the main sources are citrus fruits and berries. Intake has fallen by 90% since the Neolithic period⁽⁴⁾.
- Carotenoids; main sources are fruits and vegetables. Intake has fallen by about 50% in the last century⁽⁴⁷⁻⁴⁹⁾.
- Flavonoids; the main sources are fruits and vegetables, especially skins. Intake has fallen by about 75% since Neolithic times⁽⁴⁷⁻⁴⁹⁾.
- Omega 3 oils; the main source is sea foods. Intake has fallen by 75% since Neolithic times⁽⁵⁰⁾.
- Phospholipids and sterols; the main source is unrefined vegetable oils. Intake is down by 50% in the last century⁽⁵¹⁾.
- Pre-biotics; the main sources are artichokes, oats, leeks and onions. Intake is down by 50% in the last 50 years^(61 and MAFF data).
- Selenium; grains are the main source. UK intake has fallen by 50% in the last fifty years⁽⁵²⁾.
- Silicon; oats and hops are the main sources. Intake has fallen by 50% in the last century^(53 and MAFF data).
- Methyl groups; the main source is offal. Intake is down 60% in the last 50 years^(MAFF data).

The evidence

The four research findings cited on the previous pages are a distillate of hundreds of trials, millions of pounds-worth of scientific studies, and hundreds and thousands of hours of lab work and analysis.

For the benefit of more technically minded readers, and for anyone who wants to know more about what the scientific community has been getting up to, many of the most important research papers are listed in the reference section.

But for a shorthand introduction to health enhancement and life extension, the preceding four studies show the way ahead.

Conclusion

The research findings assembled here all tell the same story. Most of us are inadequately nourished, and our nutritional profile has worsened in the last 50-100 years. The result is that we pay a high price in terms of chronic, debilitating illness.

A few of us live long, healthy lives; and it seems clear that two of the essential requirements for life extension are an effective immune system and good anti-oxidant defences, both of which are directly related to improved nutrition.

Vegetarianism is a step in the right direction. A 12-year study reported in the 1995 issue of the British Medical Journal showed

that vegetarians, whose diet is likely to contain higher amounts of many micro-nutrients, as well as more fibre and less saturated fats, are 30 and 40 per cent less likely to die of heart disease and cancer respectively than meat eaters⁽⁵⁵⁾.

This is progress. But to ensure optimal immune and anti-oxidant defences, you need to add a programme of nutritional supplements.

Why RDAs are not enough

When it drew up the Recommended Daily Allowances (RDAs), the National Academy of Sciences never claimed these represented nutrient intakes designed to achieve optimal health. They were never more than a safety net, with the specific purpose of preventing deficiency diseases.

The real mystery is why so many doctors still mistakenly believe that the RDAs have any bearing on the health of their patients, few of whom, in the developed countries at least, are at risk of the classically described deficiency diseases.

The first RDAs were set in May 1941, by a committee of the USA National Academy of Sciences, to prevent scurvy (Vitamin C), pellagra (niacin) and beriberi (Vitamin B1). They were very effective – in that taking 30mg of Vitamin C a day will stop you getting scurvy – but we now know that this dose is not enough to prevent many reactions in the body from going subtly wrong^(20, 21, 34).

Even early on it was clear that the RDA concept suffered from two major weaknesses:

- 1 They are average values and do not take into account the needs of the individual, which may be much higher in many circumstances.
- 2 The dose sufficient to prevent depletion states is not high enough to guarantee sustained optimal health.

The latest RDAs, issued by the USA National Academy of Sciences in 1989, begin to take individual differences into account. They acknowledged, for the first time, that smokers need more Vitamin C. (Smoking uses up anti-oxidants and many smokers have such low levels of Vitamin C in their blood that they could be regarded as having borderline scurvy.)

Vitamin E

Vitamin E on its own is ineffective. Within a comprehensive micro-nutrient programme the minimum dose is probably around 265mg of D-alpha tocopherol or 100mg mixed tocopherols. The British and American RDAs are a paltry 10mg!

Vitamin C

Various studies have shown that Vitamin C becomes cardio-protective at doses of between 200 and 600mg a day⁽¹⁻³⁾.

Our Stone Age diet probably supplied about 400mg a day⁽⁴⁾.

The Americans are now considering increasing the RDA to 200-300mg a day.

The EU RDA for Vitamin C is still a mere 60mg a day.

WHY DISEASE STRIKES : **Malnutrition**



The initial study on requirements for Vitamin C was done on six convicts for a period of nine months – and two convicts escaped before the study was complete!!

RDAs don't always prevent B vitamin depletion

Even people who are consuming the RDAs of the B vitamins are suffering, from a biochemical viewpoint, from a type of depletion, where the resulting changes in their metabolism dramatically increase their risk of coronary artery disease and other problems⁽³⁴⁻³⁹⁾.

But smokers suffer from more than low Vitamin C: they also have low levels of Vitamin E, beta carotene, zinc, and Vitamin B6. It seems obvious that the RDAs for these nutrients should also be increased in smokers – but we'll have to wait for years before the RDAs are next re-examined.

What about drinkers? Heavy drinkers tend to have a poor diet and don't absorb nutrients as well as they should. They often have low levels of folate (folic acid), Vitamins B1 and B6, beta carotene, zinc and Vitamin C. The RDAs for these nutrients should be higher for drinkers, as well as smokers.

And what about athletes, pregnant and nursing women, and the elderly who eat less food and don't absorb nutrients so well? What about people exposed to common environmental risks such as increased lead, mercury, traffic fumes, solvents and pesticides? What about the millions of people on fad diets, who are depleted in many nutrients either because they are not eating enough food, or because they are eating crazy combinations of food?

We need a new measure to answer the question, "What are the optimum levels to maintain health, rather than the minimum levels to prevent disease?" One version of this measure is called the SODA – **Suggested Optimum Daily Amount**.

On the next page I have given SODAs for many of the nutrients which research shows are capable of cutting the risk of heart disease, strokes, certain cancers and Alzheimer's.

POOR EVIDENCE

Since 1951, critics have attacked the way in which the RDAs were drawn up. The American RDA for Vitamin C, for example, is based on a study of just four prisoners (there were six, but two escaped!). They were eating a diet low not just in Vitamin C but in other nutrients too.

Even more seriously, the studies involved in setting the RDAs only lasted six to nine months – about one per cent of the human life span.

Many scientists feel that these short tests could not possibly give any accurate idea about lifetime nutrient requirements.

Animal experiments have shown that although small doses of nutrients may be just enough to maintain health for short periods of time, they are often far too small to maintain health over the life span of the animal.

**Suggested Optimum Daily Amounts (SODAs)
versus average intakes and RDAs of some key nutrients**

Vitamins

	A	B1	B2	Niacin	B6	B12	Folic Acid	C	D	E*
SODA	1800mcg	10mg	10mg	60mg	10mg	15mcg	450mcg	550mg	15mcg	110mg
Av. Intake	1012mcg	1.7mg	2.0mg	39mg	2.4mg	7.2mcg	252mcg	58mg	2.9mcg	9.3mg
Sup'mt level	800mcg	7.5mg	7.5mg	15mg	7.5mg	6.7mcg	200mcg	500mg	10mcg	100mg
RDA EU	800mcg	1.4mg	1.6mg	18mg	2.0mg	1mcg	200mcg	60mg	5.0mcg	10mg
RDA US ⁽¹⁾	800mcg	1.2mg	1.2mg	15mg	1.3mg	2.4mcg	400mcg	82mg	5.0mcg	15mg

Minerals

	Selenium	Zinc	Calcium	Iron	Magnesium	Chromium	Copper	Manganese
SODA	185mcg	20mg	980mg	10mg	400mg	150mcg	2.5mg	8mg
Av. Intake	35mcg	11mg	917mg	13.2mg	308mg	30mcg	1.5mg	4.6mg
Sup'mt level	150mcg	10mg	100-150mg	Nil**	100-120mg	120mcg	1mg	2mg
RDA EU	75mcg	15mg	800mg	14mg	300mg	125mcg	2.5mg	5mg
RDA US ⁽¹⁾	55mcg	10mg	1000mg	18/8mg women/men	370mg	30mcg	0.9mg	2.1mg

Other Nutrients

	Carotenoids			Essential oils	Vitamin K	Phyto-chemicals	
	Beta Carotene	Lycopene	Lutein	Omega 3		Flavonoids	Isoflavones
SODA	12mg	7.5mg	7.5mg	750mg	95mcg	400mg	45mg+
Av. Intake	1.9mg	2.5mg	1.5mg	150mg	45mcg	140mg	5mg
Sup'mt level	7mg***	5mg	6mg	600mg	50mcg****	250mg	40mg
RDA EU	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
RDA US ⁽¹⁾	N.A.	N.A.	N.A.	N.A.	105mcg	N.A.	N.A.

mg = milligram mcg = microgram

Source for average intake Council for Responsible Nutrition and industry sources.

Source for optimum intake (SODA)..... Author's estimates based on survey of over 4,000 studies.

The SODA allows for the average intake from food.

RDA..... Recommended Daily Amounts

RDA US..... The US RDAs differentiate between women and men. These are given in full on page 348, but averaged for this table, except for iron.

* When supplementing with mixed tocopherols the Vitamin E total can be reduced to 100mg.

** Except in women of child-bearing age

*** Smokers should **not** supplement with beta carotene.

**** Except for patients taking warfarin or similar drugs

Note: As we progress through this book you will see that some of the nutrients in which the average person is most depleted are some of the key elements in maintaining the balance between wear and repair, and therefore health. In particular, most people consume inadequate Vitamins C, E and folic acid, too little of the carotenoids, Omega 3 and the flavonoids.

Sources of nutritional research

One way of determining the optimal doses of the various nutrients is to look at trials where high doses of vitamins have been given to large numbers of people to try to reduce the risk of illness.

Unfortunately, most of these trials ran on pharmaceutical lines, ie they looked at the effect of single micro-nutrients, or very limited combinations. Because micro-nutrients do not work in this way, these badly designed studies produced conflicting or negative results. Adding in animal, epidemiological and other data, however, yields estimated optimal doses which have largely discredited the idea that RDAs define adequate nutrition; and give us valuable pointers as to what levels of vitamins we should take; and what quantities of trace elements such as selenium, boron, molybdenum and silicon might be most helpful to us!

Furthermore, nutritionists are looking at whole new classes of nutrients, which in many ways resemble the vitamins and are probably as important for our overall health. The hydroxycarotenoids, for example, are closely related to beta carotene and Vitamin A. There are hundreds of compounds in this family and several of them have profoundly positive effects on our health. Many have pronounced immune-enhancing and anti-cancer effects.

Two of them, lutein and lycopene, are essential to the long-term health of our retinas and prostates respectively.

Then there are the flavonoids, found in

many fruits and vegetables. Some help to maintain the normal function of the blood vessels; others protect against inflammation; others are used to treat Reynaud's Syndrome and cerebral insufficiency (insufficient blood/oxygen supply to the brain). Several flavonoids have been linked to a decreased risk of cancer.

The carotenoids and flavonoids are called phytochemicals (meaning chemicals from plants). There are over 4000 compounds in these two classes of phytochemicals alone, and we know of at least five other classes of nutrients which also act to protect our health. (See Chapter 13, Cancer, and Chapter 14, Heart disease.)

A new approach

So how can the scientists keep track? How can doctors identify the optimal diet, with the optimal levels of all these nutrients? Basically, they can't. The problem is too complex to solve completely. But one major study, carried out by Professors Emanuel Cheraskin and Warren Ringdorff, at the University of Alabama Medical College, has provided the first concrete step towards optimal nutrition.

They started with one appalling fact. In America, despite the best medical care that money can buy, five out of six people in their 60s have one or more of the major degenerative diseases.

As an indication of the probable accuracy of Cheraskin and Ringdorff's work, their SODA for Vitamin C is around 400mg/day.

This is almost exactly the same as the figure which has recently been calculated for the daily intake of primitive man, who ate a diet with a much higher content of fruits and vegetables than we do⁽⁴⁾.

The SODA, for Vitamin C at least, seems to be very much in line with the nutritional content of the diet we evolved with, and were 'designed' to live on.

However, just 1 in 6 remain healthy through their 60s – and many of these people continue to be healthy into their 70s and beyond. The authors were concerned to discover just what was different about this 1 in 6 and spent 15 years examining the lifestyles and health of over 13,500 subjects in six different areas of the USA. The \$2 million study produced an amazing amount of information: 49,000 pages of data, bound into 153 volumes, which have been presented in over 100 scientific papers during the last 20 years or so. This enormous database is still generating papers, and there is undoubtedly more to come; but the interim message is blindingly clear.

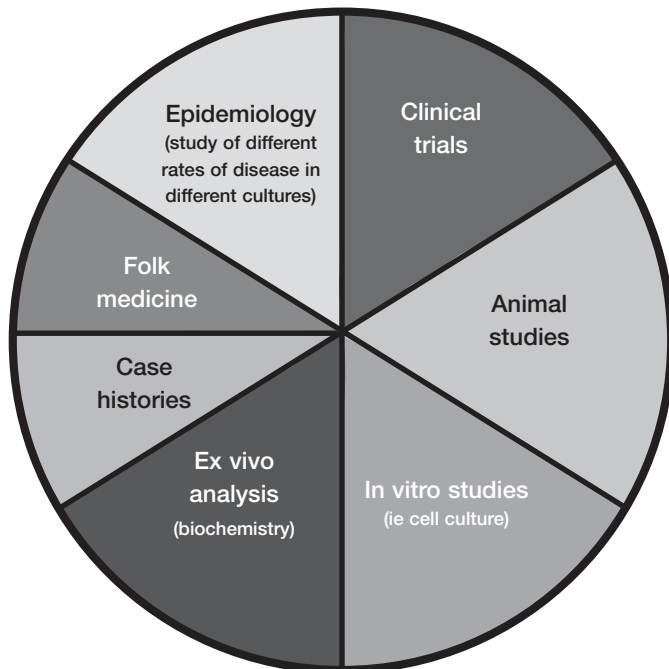
The one thing that was different about the healthy folk was that they ate a diet which consistently contained higher levels of nutrients.

Cheraskin and Ringdorff analysed the nutrient content of the diet of the healthy group, and used this as the basis for their new recommended dietary allowances – SODAs: **Suggested Optimal Daily Amounts**.

These SODAs do not take into account some of the more recently discovered phytochemicals described above, but they do give us clear guidelines for a first step towards optimal nutrition and optimal health.

How nutrient levels are determined

There is no one way to determine the optimum levels of any one nutrient. Nutritional information is drawn from a number of sources.



SUMMARY

- The RDAs (Recommended Daily Allowances) were established as the level to prevent disease, NOT to achieve optimum health. Moreover, they assume you are in good health, lead a stress-free life, are under 60 and have a perfect digestion.
- Some RDAs were based on small, unscientific samples.
- The RDA for Vitamin E is 10mg, the average intake is 11mg, but the optimal level of intake is probably at least five times greater.
- The RDA for Vitamin C is 60mg, the SODA (Suggested Optimum Daily Amount) is 550mg.
- The SODAs for the B vitamins, which help prevent heart disease, are about five times the RDAs.
- Our bodies didn't evolve to function well in our lower exercise, lower calorie, lower micro-nutrient life style.
- Very few people obtain an adequate intake of all the vitamins and minerals from their diet.
- The effects of vitamin and mineral depletion are not immediate.
- Our defence systems gradually deteriorate until, by the age of sixty, 80% of us find ourselves victims of one of the degenerative killers – cancer, heart disease, diabetes, stroke, osteoporosis.
- A common denominator in the 20% who stay disease-free is a higher vitamin and mineral intake.
- Higher intakes of almost all micro-nutrients are needed to maintain a healthy immune system.
- The pharmaceutical or 'magic bullet' strategy uses drugs to block a step in the disease process. Lack of specificity often causes toxicity as a side effect.
- Nutritional therapy supports the body's own defences, and any side effects are generally positive.