Fresh Food and the Health Epidemic

Newsletter July 2014

Wicking baskets and the Ying Yang system

This month's newsletter is about wicking baskets. These are really very simple and the 'what' can be described in a few words, however the 'why' and 'how' takes much longer than the simple what.

As you probably know I have spent the last three months in China looking at the upsurge in diabetes and for specialist health giving plants. I have come up with lots of ideas which I am keen to share with you and get some feedback on your level of interest.

Incidentally I am calling the wicking basket the Ying Yang system which implies health and fertility in Chinese.

The great health epidemic

The words health epidemic conjures up images of deceases like bird flu which spread rapidly through a population killing or hospitalising large number of people. Bad as these may be we are experiencing a much worse health epidemic which is not caused by some dangerous virus but is caused by what we eat which makes us fat.

But it is more than external fats e.g. big bums and tums which may not look too good but are medically pretty harmless (not good but not the killer). The killer is the fat which surrounds our vital organs and can occur in people who still look quite slim.

It is easy to blame the fast or processed food industry but the heart of the problem lies in our stomach, if you will excuse the play on words. Our stomachs send out hormones or neurotransmitters which signal our brains either stop eating or eat more. I recently learned that these signals are influenced by bacteria in our stomachs. If these are killed by incorrect use of antibiotics then the signals for us to stop eating are interrupted and we get fat.

Processed food, which contains carefully balanced proportions of sugar, fat and salt suppress these signals so we still feel we want to eat more even though we full. If our diet is lacking in key minerals and vitamins the hormones will tell us to keep on eating more. If the food is low in these key minerals and vitamins we still won't feel satisfied and will keep on eating – result we get fat.

Whether we like it or not our bodies have evolved to eat significant quantities of green vegetables and fruit. These supply our bodies with a range of mineral, vitamins and phytochemicals such as zinc, iron, calcium, selenium, Omega 3 Vitamin B2, B1 D, E, F etc. which are vital for replacing our cells.

We also benefit from energy in the form of protein, carbohydrates, sugar and fats etc. particularly to power our large brains.

However our modern diet contains too much sugar, fats and salt where fat accumulate around our vital organs even for people who have not yet become obese. In small quantities sugars, fats and salt are not a health problem but in larger quantities they become both toxic and addictive. They will actually create chemicals signals, neurotransmitters which fool the brain into thinking that the body is still hungry so we just keep on eating.

This creates a class of health problems known as the metabolic syndrome and its associated deceases such as diabetes, hypertension, lipid abnormalities, cardiovascular disease, polycystic ovarian disease, cancer and dementia.

This is already a major health epidemic affecting virtually all countries and costing the health systems billions of dollars. But even more alarming is its rapid increase.

It is no good simply going on a diet and reducing the amount of food you eat, the body senses the lack of these vital nutrients and sends out chemical signals creating craving for more food. The solution is to eat more vegetables and fruit containing the essential nutrients. These are generally bulky containing large amount of fibre which helps the body excrete toxins and unwanted fats in the body.

However soils are generally depleted in the essential minerals so just eating more vegetable is not a total solution, plants must be grown in soil rich in minerals and with the soil biology which releases the minerals and makes them available to the plants.

The Ying Yang organisation will operate an on line purchasing web site which connects consumers concerned about their health directly to growers willing to put the time and resources into growing a wide range of plants with the needed minerals, vitamins and phytochemicals. The range of plants includes ancestral plants which have a higher nutritional value. Consumers can contract the growers to grow special plants or simply buy their plants from the open web market place or at any time in between.

The Ying Yang organisation will arrange for the growers soil to be analysed by independent laboratories and accredits the grower so the consumer has an assurance of quality.

Farmers grow the plants in a transportable basket in a ‘mother wicking bed’.

The Ying Yang organisation will organise transport from the farm directly to the consumer or a local depot. The customer then places the basket in a ‘daughter wicking bed’ where the plants continue to grow in their basket until the consumer harvests them, preferably using the chop and chew method where the outer leaves are removed for eating and the plant continues to grow more leaves.

This system ensures the plants are both fresh and full of the essential nutrients needed for health.

Part 1 the proposal

The Yin Yang food system

The proposal is to set up an internet trading and fresh food distribution organisation based on the wicking basket system. This is the name referred to and used in the various Patents however the name Ying Yang System (YYS) is preferred as a commercial trading name and the Ying Yang Organisation (YYO) as the entity which commercialises this technology.

This basic concept is to bring the customer and the farmer into direct communications through a web site operated by the Ying Yang Organisation (YYO) which receives a royalty on trade.

Internet trading in organic food has been around for a long time, with large companies like Coles and Woolworths in Australia, Amazon and Ebay, and individuals and small groups offering organic produce. These generally offer packaged products because of the difficulties of transporting fresh produce.

The benefits of the Ying Yang System in food distribution

Freshness is a key benefit of the Ying Yang system

The Ying Yang or wicking basket system eliminates the major problem of distributing fresh food. Plants are grown in a basket in a 'mother' wicking bed. When sold the basket is transported to a 'daughter' wicking bed at the customers premise. The plants are harvested, or preferably consumed using the cut and chew system (removing outer leaves which the plant will regrow).

The key point is that the plants are sold as living plants.

This offers many advantages over the traditional system in which plants are harvested at the farm as plants start to deteriorate from the moment they are harvested. Traditionally this is reduced by refrigerated transport to the shop or market and cold display shelves are used to minimise degradation but it is normal for produce to be well past its best before being eaten.

In some cases produce has to be discarded without being sold which is a cost which is factored into the price.

By comparison the Ying Yang wicking basket system removes this time pressure as the plant will continue to grow in its own basket throughout transport and storage until eaten so it is absolutely fresh.

Improved transport logistics is a major benefit of the Ying Yang System

Another benefit is the logistic of distribution. Often the costs of distribution, from farm to warehouse, to store to home are higher than the value of the product itself. But these are the financial costs do not reflect the reduction in value of the product as it deteriorates in transport.

In the Ying Yang system plants can be transported directly from the grower to the customer or at least to a single distribution point and then to the customer. This is intrinsically cheaper with no degradation during transport.

This system may also allow the collection of food waste back to the farm for composting to improve soil quality.

How the Ying Yang System improves health and the metabolic syndrome

The motivation behind this proposal is a solution to metabolic syndrome and its associated deceases such as diabetes, hypertension, lipid abnormalities, cardiovascular disease, polycystic ovarian disease, cancer and dementia.

These are primarily the result of diet, particularly excess sugars (specifically fructose) which are ubiquitous in modern foods. These are discussed in detail in Part 2 but the key point is that fructose generates neurotransmitters or chemical signals which block the signals to the brain which tell us to stop eating; we feel hungry and continue to eat even though full. Our internal organs become covered in fats leading to the metabolic syndrome and its associated damage to health. Later we become overweight or obese.

Our food, grown in soils which have become exhausted of the key minerals, is often deficient in critical mineral, vitamins and phytochemicals which again mean we are full but not satisfied, so we just keep on eating.

The hungry beast within.

Ying Yang food is certified to be grown in soil with nutrients essential for human health

The Ying Yang Organisation will provide a certification system ensuring the farmer is applying the required micro nutrients and soil biology to provide essential minerals, vitamins and phytochemicals.

Conventional agricultural soils are often low in critical micro nutrients which are essential for health.

When we offer the common vegetables we will certify that they are grown in soil with these needed trace elements which have been added to the soil together with biology (such as mycorrhizal fungi and worms) needed to make them available for the plants.

Ying Yang produce will include plants which are naturally high in minerals, nutrients and phytochemicals.

The produce offered would be the common fruit and vegetables but a particular speciality would be what is commonly called ancestral or heritage plants. Many of the common vegetable currently on sale have been developed for ease of growing and selling but are often not high in nutrients or taste. Many ancestral or heritage plants are naturally much richer in micro nutrients such as Omega 3, vitamin D and B12 which are typically deficient in a modern diet. These plants are not readily available because they are more difficult to grow and hence more expensive so farmers are unwillingly to run the risk of speculative growing.

Particular varieties of these heritage plants have very high Omega 3 and vitamins B2 and B12 contents which are the critical nutrients essential for human health and which are often deficient in conventional diet.

Herbs, spices and flavouring

It is fine for me to go on about the benefits of vegetables but it does not matter how healthy they are if people do not eat them. Food must taste good.

I once had to travel around inland Australia showing a group of Chinese officials our irrigation system. They simply could not handle our Australian food and decided to cook their own. They bought a cabbage, vinegar, sugar and spices and we fed on sweet and sour cabbage – it was simply delicious.

Herbs, spices and flavouring should be a critical part of the Ying Yang system. They can add critical trace elements but above all they can make what would otherwise be a boring meal into one which is really tastes good.

Appetite stimulants and suppressants

Our recent understanding of the neurotransmitters which make us feel hungry or full is among the most important of medical discoveries. Modern food processors have benefited by developing foods which block these neurotransmitter so they stop us feeling full so we just keep on eating.

Their job is not to make us healthy; it is to make profits for their shareholders. This is the rules of a capitalist democracy. Churchill once said that democracy was a terrible system, but the others were much worse.

There are a variety of specialist plants which control our appetites, this is an area where modern research could lead to major advances but there is there is significant knowledge from traditional sources.

In the Ying Yang system there is no middle man, the customer contract directly with the farmer with the Ying Yang Organisation earning a royalty on sales.

A feature of the scheme is that customers will be able to contract farmers to grow these specialist plants. Information on these plants will be available on the web site together with a list of farmers with their location who are willing to grow these

specialist plants with indicative prices allowing the customer to pre-order the selected plants form chosen growers.

The Ying Yang system ensures customers feel full and are not craving for more food.

The slimming industry (which has largely been unsuccessful in permanently reducing weight) has focused on restriction of selected foods. These fail because the body has neurotransmitters or signal chemicals which tell the brain that the body is deficient in certain key nutrients and the body needs to eat more so it sets up virtually irresistible cravings. After a period most people simply give in and start eating more food. The fact is most diets may lead to an initial loss of weight but almost invariably the weight goes back on again after a period.

The Ying Yang approach is to provide food with the required minerals and vitamins so the body is satisfied and people do not feel hungry. A certain degree of bulk, particularly fibre, is required in our diet. Fibre will actually help remove unwanted toxins and fats from the body. People feel satisfied even though they are actually slimming and reducing weight. This makes weight loss viable.

Required Actions

The web site

The web site needs to have the conventional trading facilities as is common commercial web sites. But is also needs two more sections; -

- the first is an educational section which explains the medical requirements for health - for example much of the information in Part 2
- the second section will describe the features of the various plants which are available, particularly the herbs and spices and ancestral plants which are not well known.

Education and promotion

YYO needs customers who are prepared to pay slightly more for food with guaranteed nutritional content. Many customers will be well aware of the health problems of becoming fat and the hazards of the various deceases such as diabetes.

However many people will be unaware of the medical background that underlies metabolic syndrome, how the various neurotransmitters work to create the hungry beast within us that eventually forces us to eat more (of the wrong foods).

The Ying Yang Organisation – intrinsically ethical

It also must be recognised that there are unscrupulous operators which provide competition, the processed food industry is the largest global industry and has shown that profits override other considerations particularly their customers health. There is also the slimming industry which is renowned for selling fake remedies to gullible people.

To be successful YYO must be intrinsically ethical, with concerns for its customer's health, and successfully promote this to the market. This is not a unique business situation; there are many companies, whose success lies in promoting their honesty and business ethics. People don't like being screwed, as they often are in the food business.

The web site will be a critical part of this educational program but customers need to be drawn to the web site.

Growers

A collection of growers are needed who are prepared to commit to the growing protocols, specifically the restriction on toxic chemicals and the addition of micro-nutrients and soil biology to ensure the nutrient value of the plants, which is the key point of the commercial offering.

The Ying Yang organisation will need to work with the growers to educate them on the processes that need to be adopted.

The farmers will be directly contracting with the consumers who may require early assistance from the Ying Yang Organisation.

Certification

The key market offering is the superior nutritional value of the plants. I envisage that the Ying Yang Operation will visit the farms and sample the soil on a regular basis and actually supply the growers with the required nutrients and biology (paid for from the royalties).

YYO will use independent soil measuring organisation who can certify the nutritional content of the soils.

Why this business formulae

On line buying

On line buying is the fastest growing section of the retail industry. Several models are widely used. In Australia our two main retailers, Coles and Woolworths are both offering on line buying which includes fruit and vegetables.

The mechanics they are using however is simply an extension of the store model. Special staff go around a conventional store picking up the products, putting in a box then transporting to the customer which incurs additional costs. The transport costs are also built into the cost of the products which makes them more expensive on list price than direct shopping.

Customers direct shopping pay for their own transport costs to the store. It is probably cheaper overall to have a van making multiple deliveries rather than every customer making a special trip to the supermarket.

This conventional system is a ‘middle man’ system with the company buying from the farmer then selling to the customer. The store then controls the margin between purchase and resale.

In the proposed Ying Yang system the customer contracts directly with the individual farmer with the Yong Yang organisation earning a fixed royalty on sales. The Ying Yang Organisation acts as a certifying and enabling operation. Adding the additional nutrients and soil biology to the soil increases the cost of production but improves customer health.

People are quite willing to pay extra for better health but they need assurance that the product is actually superior. The proposed system has greater credibility as Ying Yang is not under pressure to maximise margins.

Amazon offer an on line organic operation, as far as I can see this is largely packaged goods (not fresh) and again they are adopting a middle man role.

Ebay is nearer the proposed model but Ebay are purely offering a market place and it is up to the customer to determine the quality of the product.

There are many farmers offering on line trading for their own products which is closer to the proposed model, however this is generally for their own products which are inevitably limited in range and seasonal.

In the proposed Ying Yang Model there will be a whole range of products available from different growers in different regions. Whatever criticism we may have of conventional food distribution they provide a wide range of products throughout the year. People have become very accustomed to this and would expect as good if not better range from an online operation. People will go on line to buy speciality products which are not readily available from conventional shops.

Why sell food rather than boxes?

I thought I should include some notes on why I am proposing this business formula.

I developed the wicking bed system about fifteen years ago, as a humanitarian operation to provide sustenance food to starving peasants in Africa. There were no commercial aspirations.

However wicking beds have become popular with amateur gardeners thought the world. Some companies have tried to muster in on this technology by providing ready-made wicking beds, and there now a number of commercial offering on the market. I entered into an arrangement with a company to market a particular design of wicking bed but the reality is that this (and the other systems) was not really commercially significant.

Wicking beds are easy enough for an amateur gardener to make themselves so there is little room for a premium pricing strategy.

A typical wicking bed may sell for between $100 and $200 (in Australia) and a gardener is only likely to buy one or two. However people will spend over $20 every

week ($1,000 every year ongoing) on vegetables, and significantly more for premium vegetables such as certified organics.

There is also a question of scale. The number of overweight people in the US exceeds 100 million, with comparable figures in every developed country with the globalisation of the food industry. The rapidly developing countries are following a similar trend, it is a global problem of an immense scale.

This is not going to be solved by selling a few wicking boxes or any of the other similar products for home growing. These products, although providing entertainment and interest to a minority group, are simply not on the scale needed for resolving one of the major challenges facing humanity.

Part 2 Realities underlying the Ying Yang system.

There is a great deal of emotion surrounding food. To those lacking sufficient food it is a basic requirement for life - for others food at a fine restaurant is the height of luxury - to others it is a key to health. But these emotions often lead to distorted opinions on what is real.

Let me try and look beyond the emotions to find the reality.

There is little doubt that food is among the major challenges facing humanity but probably not in the way many people think. It is true that some billion people around the world are suffering from starvation or malnutrition, fortunately this number is slowly declining as affluence spreads.

However there is an even bigger challenge which threatens the health of virtually every one on this planet - obesity, and even more importantly fat accumulation around the vital organs even in thin people. This fat epidemic is increasing in virtually every country and leading to major health problems particularly diabetes, heart attacks, strokes and in some instances cancer. What is often referred to as the metabolic syndrome.

Obesity itself is not the most common cause of these deceases of affluence. The dangerous fat accumulates around the vital organs and a person can be relatively thin but still have this dangerous fat layer. This is often referred to as FITO fat on the inside and thin on the outside. Although obese people are twice as likely to suffer from these deceases there are many more people who are FITO so in absolute terms there are more thin people that fat people who are at risk.

It is a global problem, but taking the US as an example 75% of the health costs are the result of fat, a staggering $245 billion dollars and increasing at 8% p.a. a year.

The number of people suffering diabetes in China has now surpassed the US with the number of new sufferers increasing even faster than the US.

The reasons are more complex than the way food is grown; (although soil degradation is a universal problem) it is the entire way our food is grown, processed and distributed.

Are diets missing the point?

I have Google alert on diet and health. Every day I receive the latest publications and article but often end baffled. There are so many different some recommend meat, others say eat vegetarian, others say eggs are highly beneficial while others say they should be avoided at all cost. Milk attracts the biggest range of controversy.

Most so called slimming diets may work for a short period but typically fail over time.

One of the largest and most respected studies was the China report which examined the health over time of thousands of people on different diets and after extensive

statistical analysis came to the conclusion that eating vegetables was the key to health. But the problem with statistics is that it can average out critical pieces of information. In this case that certain communities in mountainous Western China had virtually a pure meat diet, simply because it was so cold and there was so little top soil in the mountains that it is virtually impossible to grow crops. Yet these people were extremely healthy.

These mountains have young volcanic soils which grow a variety of wild plants which the animals eat. They also have plenty of exercise roaming around the mountains. Compare this with lot fed cattle which are fed processed corn and injected with antibiotics which act as growth hormones. It may well be that we are missing the point. The critical factor may be the quality of the soil from which our food is derived.

Eating meat from healthy cattle may be better than eating cabbage whose growth has been boosted by large applications of N P K fertiliser but on worn out soils.

Probably the best way of understanding this complex issue is to have a brief review of the history of food.

Brief history of food

Prehuman primates

The early prehuman primates lived several millions years ago but it is generally thought that they had evolved to become substantially human about 200,000 years ago. The prehumans lived in a period of high temperatures and were forest dwellers. They were mainly fruit eaters and it does not take much brain or brawn to pick red berries.

While these prehumans were rather puny creatures small, weak and stupid they did have a feature which has carried through to us today - their social behaviour. A small creature with virtually no defences is easy prey to wild predators but by forming groups they developed some measure of self-protection by having an early warning system for defence. They were brutal times, the creatures on the outside may have been eaten but the ones at the centre still survived. The species survived even though many individuals died.

They were communal animals and survived by working together in hunting for food and protection. Today we can see monkeys collaborating together, shrieking and throwing stones at lions and leopards which pose a threat, usually driving the attacker away but at the worst there is only one victim which does not affect the survival of the group as a whole.

The ice age

Then the climate changed to an ice age, so from 200,000 years ago until 10,000 years humans were hunter gathers in more open Savannah. This is very relevant to today as during this period our bodies evolved basically to their current form, we

have not changed much since then. Understanding how we co-evolved with the environment helps us understand our modern predicament.

Much of the dense forests were replaced by open Savannah. Our prehuman ancestors were forced out into these open plains and had to develop survival techniques which led to major changes to our species. We became predominantly bipeds standing tall to watch for both prey and predators. You don't have to be an evolutionary expert to see the advantage of standing tall to see a sabre tooth tiger before he sees you.

Brain power

However the biggest change was the development of our large brains which are both a benefit and liability. They provided our ancestors with the ability to hunt together in a highly effective and planned way, so effective were our ancestor that they were able to hunt and kill very large and powerful animals like mastodons. Many anthropologists think that our ancestors were responsible for the mass extinctions of some very large and ferocious animals.

These early humans were physically strong, intelligent and capable creatures, similar to us today. They may not have natural weapons like claws and teeth but they had developed weapons and remarkably had become master of endurance, able to simply keep on running until their prey became exhausted and collapsed.

The disadvantage of our large brains is that they need a lot of energy; a modern computer nerd will use as much energy solving a complex computer problem as in physical activity. Our increased brain size evolved with our transition to an energy intense high protein diet.

Undoubtedly one of the great achievements of these hunter gathers was the taming of fire; the development of cooking, particularly meat, made large amount of energy available to our short intestine stomachs. Fire also gave our ancestors some protection from wild animals particularly and night.

Unreliable food and fat

However food supply was unreliable so we evolved to store energy as fat in our bodies for harsh times, a feature we still maintain and many people think, in these days of plenty that we would be better off without.

Another feature of this hunter gatherer period was that women breast fed for long periods of time so the number of children was limited and the population was small, too small to have any impact on their environment.

We can really only speculate on their life style and it is likely that they were not continuously on the move but would settle in an area and use up the available plant and animals then move on. In all probability they would care and tend food plants that were growing naturally in the wild. This set the stage for the next revolution - agriculture.

Modern hunter gatherers

Of course we cannot study the social behaviour of these early humans but anthropologist can study modern day hunter gatherers. Two things stand out - their intimate knowledge of plants and their nutritional and medical benefits - and their social structure. While they had leaders, and if you are hunting a powerful wild creature likes mastodons, you need someone to direct the hunt; they were a highly egalitarian community with everyone sharing the spoils of hunting and the hardship of life.

Virtually all food comes from plants and animal and plants have developed a synergistic relationship, although it is often a little difficult to understand how the plants benefit from being eaten.

It is obvious that plants that produce berries benefit as the animals transport the seeds over great distances.

It is also easy to see the synergistic relation with grazing animals and the grasses. Grasses, unlike most other plants, grow from the base and if they are not regularly eaten back they become long and lanky leaving open ground for competitive weeds to populate. Animals continuously cropping the grasses allow light to get to the soil level enabling the grasses to become dense and able to outgrow competitors.

In return many of the grazing animals have developed extensive gut systems to digest grasses; cows have four stomachs to digest grass.

Plants are the master of chemistry and many produce toxins to deter animal from eating them, but others the pre-vegetables actually seem to have developed a relationship with animals in which the plants actually benefit from being eaten.

Humans and our prehuman primates have short intestines which are unable to digest most green leaves so the plants which were digestible were extremely important to our ancestors. It can only be conjecture but probably our ancestors cared for these wild plants so although we ate them our protection also preserved these species.

However the simple fact remains that we and our prehuman primates have developed a complex arrangement with plants in which they supply us with a range of complex chemicals, both as food but also as medicines on which we became entirely dependent. This relationship evolved over hundreds of thousands of years.

No doubt the unreliability of our food supply and the obvious benefits led to the next major revolution, the development of agriculture.

The birth of agriculture

Agriculture was developed, apparently independently, at similar times in China, The Middle East and South America. The motivation was clearly to provide some protection against the variability of food supply in a hunter gather system. This early agriculture exploited the flooding of rivers which provided both irrigation water and on-going supply of nutrient rich flood silt.

Agriculture was a mixed blessing. It certainly increased the reliability and availability of food, however living in close proximity in villages and cities with poor hygiene resulted in people being very prone to plagues. Although the last major plague was the Black Death, which wiped out about a third of the then current population, occurred several hundred years ago we still suffer from communicable deceases.

The larger societies led to a new phenomenon in human behaviour, the rise of a ruling class which seemed perfectly willing to exploit their fellow humans. The great architectural achievements of these early civilisations, such as the pyramids, were created by slave labour serving the wishes of a very small minority - the exploitation phenomena.

The spread of agriculture

Agriculture expanded away from the river systems and much land was cleared for agriculture. Many people tend to think of climate change as being a result of the industrial revolution but there was massive ecological damage caused by forest clearing by this early agriculture.

However growing crops away from the beneficial river system which dumped huge amounts of fertile silt was much more difficult. This led to major improvements in technology such as crop rotation, recycling of waste and nutrients. China is the classic example having a stable agricultural system which was self-sustaining for some four thousand years.

Agriculture may have helped reduced the unreliability of food supply (although famines were still common) it enable the global population to increase, however the variety of foods, now reduced a few types of crops, did not compare with the wide range available to the hunter gatherers. While the number of people increased they became smaller, weaker and prone to decease.

Agriculture and population during the early industrial revolution

The industrial revolution bought many benefits, particularly sewage and modern medicine.

Sewage system meant that nutrients, once returned to the land in a stable system is now processed (hopefully) and dumped into rivers and eventually the sea depriving the land of renewable nutrients. This is a problem we have yet to resolve as sewage systems are contaminated by heavy metals lead, cadmium, mercury etc. which makes reuse a major technical challenge yet to be resolved.

Modern medicine resulted in a dramatic drop in infant mortality. It takes time for society to change and people continued to have large families on the basis that they needed to have many children so some would survive to care for parents in their old age.

The resultant population explosion and limitation of agricultural output caused a worldwide scare of running out of food, an attitude which is still wide spread.

The challenge was met by the green revolution. The initiatives, led by Norman Borlaug, the "Father of the Green Revolution" credited with saving over a billion

people from starvation, involved the development of high-yielding varieties of cereal grains, expansion of irrigation infrastructure, modernization of management techniques, distribution of hybridized seeds, synthetic fertilizers, and pesticides to farmers.

There is no doubt these early pioneers were acting with the best of intentions and the results were dramatic such that we are now producing enough food to feed double the current world population.

However the benefits were not uniformly distributed, as I learned from my experiences in Ethiopia.

Ethiopian experiences

When I sold my company Moldflow I was in a position to devote my energies to my interest of soil and water and had the resources to conduct speculative research without having to go through the tedious process of convincing the funding organizations, (who are invariably conservative) that a particular research project should be funded.

This conservatism I can well understand and indeed many of my hair brain schemes failed, but this is the nature of speculative research. Most ideas do fail but the odd one that actually works pays for all the failures. (If you can't stand failure then you should not be in the business of speculative research.)

As a result of my experiments I was invited by World Vision, Australia's largest NGO to go to Ethiopia to see if I had any solutions to the current wave of starvation which was wreaking havoc in Sub Saharan Africa.

I started this project full of naïve optimism thinking that the solution would lie in new technology. True - this did lead to my developing the wicking bed as a cheap water storage system which is now widely adopted throughout the world. However it did shatter my ideals of a purely technological solution.

There are few things in life as sobering as seeing starvation in reality, watching mothers without enough food for themselves watch their babies die because they have no milk to feed them.

But I had to learn the hard way that technology by itself, however good is not going to solve the starvation problem, and in fact may make it much worse.

The number one cause of famine around the world is war. And the root cause of war is our social structure which traced back to the early stages of agriculture. Humans are a deeply social animal, which is how we have become the dominant species on earth. To cooperate in a social way with other humans is a deeply ingrained instinct of humanity.

However a very small minority are fully prepared to work themselves into a position of power and exploit other humans in a ways which can only be described as shocking. War is not caused by the majority of people in a tribe or nation wanting to go to war against other tribes or nations, it is caused by one or very few people who

have worked themselves into a position of power wanted to increase that power by overcoming other tribes or nations – the exploitation phenomena again.

The second cause of famine, which became abundantly clear in my time in Ethiopia, is the powers of the giant multi nationals, which again suffer from a handful of people having too much power without social responsibility. Much of the best land had been bought up for the production of luxury foods, particularly coffee for the affluent West. The two great addictions of the West - coffee and chocolate- cause great misery in developing countries.

It must also be noted the great damage done to developing countries by the American subsidies to their farmers which have lowered the price of commodities in third world countries to inflict poverty on many.

The green revolution has certainly helped the richer farmers in third world countries but has often been a disaster for the poor who cannot afford the new technology.

Fatness in the affluent countries

Fatness really became an issue in the affluent West, particularly the US in the nineties. Many commentators blamed the fast food industry for loading their food with an excess of fat, sugars and salt. The fast food industry responded that they only supplied what people wanted to buy and eat and it was up to the individual to control what they ate.

The situation was amplified with the introduction of super-sized meals. In the fast food system the cost of food is actually only a small part of the total cost so the portion size can easily be doubled with only a small increase in actual cost. The customer is offered twice the food for only 50% more cost. The public, always sensitive to a bargain, thought this was a great deal and spent yet more money on fast food. They ate far more food than needed, made themselves sick and made greater profits for the food companies.

To its credit the top management of McDonalds, the largest of the fast food system actually resisted this trend preferring to stick to their traditional business of offering a reasonable serving at a low cost. However when their profits declined relative to their competitors who had jumped on the super-size band wagon there investors, the banking system put pressure on them to change their policy. It is easy to blame individuals when the system is at fault.

It is easy to blame the leaders of these multi-national conglomerates for acting unethically, and certainly this is true for some cases such as the Enron scandal. However even ethical business leaders can be under relentless pressure from the financial system for short term profits which can force them to behave unethically.

While we may debate the causes we have to accept the truth that this is the way the world (or at least the US which dominates the processed food industry) works.

Externalities the food companies don’t carry the costs of their actions

The benefits of this overs consumption flow directly to the food industry while the costs of this obesity is not borne by the food companies but by the health care

system which is forced to spend billions of dollars from the health problems caused by fat. This is classified as an externality by economist and features strongly in the climate debate and is the great weakness of a purely capitalist system.

The battle raged against the massive food multi-nationals but it was a one sided battle, the food industry is the largest industry and had immense political clout, their enemies were small and disorganized, often research scientists with little political clout and the food conglomerates always had the answer that they were only supplying the customer with what they wanted – a difficult response to counter in a highly capitalist country such as America.

This argument of individual responsibility could carry weight until modern medical research began to understand what was really happening with this new diet. The argument put forward by the food companies sounds so simple; - people get fat because they eat too much and don't exercise enough – that's a problem for the individual, not the food industry.

But modern medical research shows that this is just an easy get out.

Modern medical research

We now have a much better understanding of how the body controls the amount of food we eat. We are not like some simple machine consuming energy by eating and burning that energy by our movements. We have evolved a complex control system over the thousands of years which determine how much food we eat.

We have known for many years that our muscles are controlled by electrical signals from the brain, but we now beginning to learn about the chemicals sensors which controls how much and what type of food we eat. These chemical sensors tell our brains and organs what to do, they tell our brain to either stop eating or eat more and a various organs to store or release fat.

This has been very well studied for sugars, which is a generic name of a range of chemicals. Glucose is the most important for us, every part of our bodies need glucose to operate and there are no harmful side effects. Common sugar from cane is a combination of beneficial glucose and fructose which is the part which causes problems. However corn fructose syrup is replacing cane sugar in many processed food products. Corn fructose syrup taste much sweeter than cane sugar and has been a boon for the food industry.

However this is proving to be a disaster on a global scale for human health.

Fructose disrupts our messenger system which controls how our body works.

Two key indicators or chemical messengers are leptin and insulin. Leptin is a key messenger to the brain telling us to stop eating while insulin is a messenger telling the various organs to release or store fats. Insulin can also block leptin from telling our brains to stop eating.

The net result is we just keep on eating, stuffing more and more food into our mouths so we end up fat.

Fructose is a toxin, in large enough quantities it leads to the illnesses of metabolic syndrome such as diabetes but it is highly addictive making us eat more and more. This is great for the food conglomerates - they sell more and more food containing fructose but it is a disaster on a monumental scale for public health.

While this may be the result of major medical research (look at YouTube for Robert Lustig) these effect are easy for us to experience personally.

Food is not just about energy we need to replace cells in our bodies

There are other foods which have exactly the opposite effect and stop us feeling hungry. This has been known for centuries by so the called primitive Bushmen of the Kalahari Desert in Namibia who use selected plants to ward off feeling hungry.

So what is the problem, why not simply mass produce and market extracts from these hunger suppressing plants? Simply because food is not just about energy. Our bodies are continuously replacing our cells and for that we need nutrients, not just energy.

This leads us onto a problem as big if not bigger than the energy crisis. For thousands of years we were evolving in conjunction with plants which were providing us with a whole range of micro-nutrients which are essential for replacing old cells with healthy cells. In our evolutionary phase we were consuming a wide range of plant rich in these essential micro-nutrients.

However modern agriculture has focused on maximum energy output by a combination of genetics, fertilization and irrigation. Plants need a range of nutrients as shown in this table.

Widely reported deficits in a modern diet

Elements needed by plants	
Elements available from the air or water	carbon, oxygen, hydrogen
Primary elements from the soil	N, P, K
Secondary elements	Ca ,Mg, S
Trace elements	Mn, Fe, B, Zn, Cu, Mo, Cl, Co
Widely reported dietary deficits	
Elements needed by plants but we may need higher doses	Ca, Mg, Zn, Fe ,Cu
Essential extra elements needed for health	Selenium, Iodine, Vanadium, Chromium
Vitamins humans are generally short of	Omega 3, B2, B12, B6, D, E, K

Plants are largely made from carbon dioxide and water which they obtain from the atmosphere. They also need the primary elements of nitrogen, phosphorous and potassium, a range of secondary elements such as calcium, magnesium, zinc, iron and copper. We need these secondary minerals too but in much higher amounts than plants need them.

There are other elements such as selenium, iodine, vanadium, chromium etc. which plants do not appear to need at all.

Selenium is used by our cells for the reproduction of our DNA and there is a view in the medical profession that lack of selenium in our diet is an issue with cancer which is caused by rogue cells do not reproduce correctly. Lack of iodine is well recognised as a cause of loss of brain function - a polite way of saying it makes people stupid or imbecilic.

I often come across interesting snippets. It is well known that fertile women need extra iron however one snippet balances the sexes. Apparently male semen contains a high proportion of zinc, enough to drain the body of its normal intake. So the message is clear for men; - either give up sex or get some more zinc into your bodies.

The problem is the farmer has little incentive to add the minerals which **we** need but the plants do not. This is not the fault of the farmer; it is a fault of the system which is largely controlled by the food giants.

Lack of essential minerals

The issue is that our diet is typically lacking in these essential minerals and vitamins derived from them.

Our bodies appear to be smart enough to sense the lack of these essential nutrients and tell our brain we need to eat more - what I call the hungry beast inside us. We simply get cravings which we may be able to resist for a time but eventually we give in and start eating. If we have a diet containing large amounts of corn fructose we just keep on piling on the fat without resolving the real issues. We just get fatter and fatter until we eat food with the needed nutrients.

The solution is not to use appetite suppressants - that just make the matter worse. We need to attack the problem at source and have a diet with balanced nutrients and not loaded with fructose. But how?

Attempts at resolution

These issues are not new and are well known in the medical profession who have tried to get legislation to ensure we have a balanced nutritional diet and hence better health. The food industry (the largest single industry globally) has immense political clout and to date efforts have failed. (Except in a few Scandinavian Countries particularly Finland).

Permaculture

These issues were well recognised by the permaculture movement over thirty years ago and it is true that a small minority of people have been successful in implementing the permaculture principles.

I did experiment with permaculture many years ago, you have to be totally dedicated, be prepared to work excessively hard and endure serious hardships. It is not a solution for the majority of people.

Organics

The organic movement has achieved limited success but has suffered from missing the key point of nutrition and instead focussing on avoiding harmful chemicals. Many organic growers take pride in not adding any external nutrients but if you keep on taking nutrients out they must be replaced eventually.

Unfortunately the organic certification movement, as least in Australia, has been hijacked by extreme greens that have approached the issue with an almost religious fanaticism.

Grow your own food

Many people are trying to grow their own food. This was an environment in which I grew up with that mythical worship of the family farm.

There are some major inspirational moments in growing your own food. There is nothing quite like the taste of fresh peas, really fresh just picked and eaten straight

out of the pod. The same applies to new potatoes which bear no resemblance to commercial potatoes.

But there is an intrinsic problem, seasonality. It is simply impossible (apart from equatorial regions) to have continuously fresh food through the year. This means that to have food all year round means growing food which can be stored. A diet of potatoes, pumpkin and cabbage is not going to compete with the supermarkets ability to import food from all over the world providing reasonably fresh food.

As kids we had a Coxes Orange apple tree – an heirloom apple variety which is renowned as being a good keeper so apples were harvested at the end of the season and stored in an underground shelter for winter. We kids were not allowed to eat any while there were other apples available but being a kid I once pinched and ate an apple straight from the tree. I can honestly say the taste was simply incredible something I can remember to this day.

This certainly makes me realise the benefits of eating fresh, not just for nutritional value but simply for taste.

Another issue for home growing is simply one of space. To be genuinely self-sufficient requires an area of about a hectare or 10,000 square metres; - totally impractical for most people.

Growing kits

There are many kits and beds, such as my wicking beds, but unless there is a reasonable area the amount of food which can be produced is only a fraction of the total food requirements for a family (although they can still providing valuable food supplements.)

The small growing kits are really nothing more than a hobby providing very little real benefit in terms of the food crisis.

Practical issues with home grown food

There are other issues for the home grower. One is simply expertise, I grow a variety of plants and each one has its own particular horticultural protocol. A home grower can certainly master the growing techniques of a range of plants but not all the plants that are needed to give an appetising diet. To have a real impact on the food problem food must be varied, attractive and desirable. This is very difficult for one grower to achieve but easy for a group of specialist growers.

The other issue it continuity of supply. A commercial grower will go to great length to ensure the entire crop can be harvested at once, typically by machinery. The home gardener is just the opposite; they want a steady stream of produce which means setting seeds on a regular basis. Now this is not as easy as may appear - the result is typically a surplus at some times and a famine at others.

This leads to the idea that some form of trading is desirable to give greater variety, smooth out production variations and if done over a distance make unseasonable produce available. (Despite the food miles).

Farmers markets

Farmers markets are increasingly popular, particularly in the UK and to some extent in the US and provide a clue on how to move ahead. It is worth thinking about how farmers markets really work in practise. They are essentially bringing the farmer and consumer in direct contact. This has several major advantages. The main one is that the farmer can promote his particular method of growing directly to the customer and if he put up a convincing argument then customers will be happy to pay that little extra.

This is particularly relevant to the addition of trace elements which add small cost to the produce. It is virtually impossible for a grower to get a higher price when selling through an intermediary such as a supermarket.

Internet trading with specialist growers

These problems such as nutrient deficiencies and excess fructose leading to food craving and hence to fatness can be potentially resolved by setting up an internet trading system connecting a range of specialist directly to the consumer with a system quality certification as outlined in Part 1.