

Harald W. Tietze

# Spirulina

**Micro Food  
Macro Blessing**

**Fourth Edition**

## **IMPORTANT LEGAL NOTICE**

This publication seeks to demonstrate the beneficial application of Spirulina for various disorders of the human body, but it is stressed that the contents of this book are in no way a substitute for personal supervision by qualified professional medical personnel.

The contents of this publication are solely the opinions of the authors. People with health problems should consult their physician.

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# ***Spirulina***

by  
**Harald W. Tietze**



## Acknowledgements

My special thanks to Tina and Peter White for opening my eyes to Spirulina. In 1984, Tina told me about the “Food from Sunlight” and bought me the first Spirulina book. Over the years we worked together on the project to grow Spirulina in a home environment to feed the hungry in the world. We are certain that Spirulina is a very important food for the future.

My special thanks to Kelly Moorehead, marine biologist, and Helen Morgan, author of the book “Spirulina Nature’s Superfood“. I learned a lot from Kelly when I visited the Spirulina Farm in Kailua-Kona, Hawaii, built on young lava rock, where 100 years earlier there was ocean. Kelly is a “walking encyclopaedia”, and with his knowledge supports me in regard to Spirulina. Kelly is the kind of person you very seldom meet, where you believe you have known this person for decades after talking only a few moments. It is great to have Kelly as a friend.

Kelly, thank you for allowing me to take parts from your book, for my book.

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Many thanks also to Bell Huang, Manager of the “Australian Spirulina” farm in Karama, Northern Territory.

Bell spent a large amount of time with me explaining Spirulina growing in tropical Northern Territory.

# Contents

Introduction	7
Why Spirulina?	8
First Food	9
Spirulina as Food for Humans	10
Commercial Spirulina	12
Australian Spirulina	12
Spirulina is not Spirulina ?	13
Natural and Processed Foods	16
Super Food	16
The biggest selling items	17
Health Food	18
The Sun Food Spirulina	19
Total Food - Whole Food	19
Dosage - how much should I take?	20
Does Spirulina Have Negative Side Effects?	20
Spirulina - Drug or Food?	22
Spirulina as a Food Additive	23
Recipes	24
Spirulina for Better Health	25
The Complete Protein	27
Radicals. Eh?	28
Vitamins through the Alphabet	28
Vitamins Supplied by Spirulina	29
Other Good Things!	31
Chlorophyll - The Green Gold	33
Minerals	33
Typical chemical analysis of Spirulina	35
Nutritional Information	37
Best value for your money	38
Overdose of, or Too Much of a Good Thing	38
Spirulina for General Well Being and Body Cleansing	39
What people have experienced using Spirulina	40
Acne	42
AIDS	42
Allergies	42
Anaemia	42
Arthritis	43
Cancer	44
Depression	45
Pain	46
Protection against Radiation	47
Heavy metal detoxification	47
Cholesterol, Hypertension, Arteriosclerosis	47
Pancreatitis	48
Loss of Vision, Cataracts and Glaucoma	48
Hepatitis and Cirrhosis	48

Gastric and Duodenal Ulcers	48
Sexual Vitality	49
Anti ageing	49
Slimming - Spirulina for the Ideal Weight	50
Spirulina for Beauty	51
Future Food	56
Land area required to grow one food ration per year	58
Water Use	59
Energy Use	59
Chemical-free Food production	60
What will we be eating tomorrow?	60
Food for the Hunger in the World	60
Spirulina affordable for starving people?	61
The now ill and starving people will be as healthy as Western society.	62
Growing your own Spirulina at home?	62
Plants and Animals	63
Spirulina compared to Chlorella and Green Barley	64
Other Spirulina Products	65
Bibliography	66

# Introduction

Two thirds of the world is covered with water. The earliest life form, which began in water, was algae. There are around 25,000 species of algae in the world. Walk on the beach and you will find seaweed, which are the biggest forms of algae, some like little trees with roots, stems, branches and leaves. Kelp and carrageen moss are the best known seaweed and are red or brown in colour. At the other end of the big family are tiny single-celled algae which are the most primitive plants on earth. Many people react negatively when thinking about algae because the first thing that comes to their mind is algae in swimming pools or toxic algae like the blue-green algae in Australian rivers. With increasing world population and decreasing agricultural land, algae is discussed more frequently for its nutritional value as a future food source which we desperately need. The nutritional as well as the therapeutic value of algae varies with the water's quality (minerals, nutrition, pH), the water temperature, ocean currents and the intensity of sunlight.

The degree of pollution in waters for food production is a concerning factor for the qualities of the product.

The most prominent food alga is Spirulina. Chlorella, fresh water green algae, is one of the smallest organisms and is approximately the size of a human red blood cell. Spirulina is approximately 100 times larger and gets its name from the shape of the plant which looks like little spirals. The dark green colour of Spirulina comes from the high amount of plant *blood* or in other words, chlorophyll, which is only one molecule different to haemoglobin in human blood. Chlorophyll in plants is collected sunlight.

All energy on the earth comes from only one source, the sun. First life, and with the first life the first food or, so we have been told, the algae. Algae can live on water and sunlight only. Humans are not as lucky because they cannot live from sun energy directly. They are on top of the food chain. The lowest on the food chain is the chlorophyll in our nature or in other words the "green" in our nature. Green matter is eaten by animals and animals are eaten by humans. To feed a human being in Western countries, with high meat consumption, the land use per head is 800 times higher than if we were to eat algae directly. The largest mammal on earth is the whale which lives solely on phyto-plankton algae; the largest mammal on land is the elephant which eats green matter only.

The diet of humans has changed a few times since they first walked on the earth. For most of the time we only gathered the seasonal foods - roots, fruits and seeds available within an hour's walking distance and we hunted and fished; the only food intake was **fresh**. As we became more sophisticated we started to preserve our food by smoking, salting and drying. The oldest and still the best way of preservation is lactic acid fermentation as in sauerkraut where the nutrients and vitamins are preserved as well. Only in recent years have we learned to preserve by heating, drying and freezing, and part of our food's value is lost during its processing.

I was introduced to Spirulina in 1984 by a good friend who worked in Spirulina research for a very long time, and she gave me my first book on Spirulina, *Food from Sunlight*, by Christopher Hills.

The simplest vegetable on earth fascinated me and the possibility of growing in desert conditions enough food to feed the world, not only today but also in the centuries to come, makes this smallest food the biggest solution.

*“All diseases are curable but not all patients because they are very much impatient”.*

## ***Why Spirulina?***

Often, when we are searching for something new, something with special properties, we tend to completely miss what is right in front of us. Deep amongst all the cabbages, beans, fruits and thousands of other foodstuffs there lives this tiny plant called Spirulina. It's so small in fact, that a garden the size of a pin's head would contain a hundred or more plants. There are indeed many other tiny, single celled plants which can be found with the aid of a microscope, but none which have the unique properties of Spirulina.

When deciding what should be prepared for a meal, the wiser folk will always try to produce a selection of food which offers a balance of all the things our body needs to maintain good health, to ward off disease, and at the same time to make an enjoyable repast. Such a meal will inevitably comprise fruit and or vegetables along with a light meat of some kind. The variety is needed for interest, but more importantly to provide the wide range of essential vitamins and minerals which the human body uses as fuel and catalyst.

No one fruit, vegetable or meat can provide everything the human body demands, but the tiny Spirulina comes so close to this ideal, that NASA has selected it as being the most important plant to use in space stations of the future. Spirulina in fact, is the richest of all living foods known, and is considered to be the original producer of the worlds supply of oxygen. Like all plants it converts carbon dioxide to free oxygen by the action of sunlight. This enables animals, and of course mankind to live here on earth.

The cells of most plants are like little bags or boxes which contain the good foods; the bag or box being made of a tough substance, usually cellulose, which cannot be digested (unless you are a termite or a cockroach). Where Spirulina is different, is that the covering of its single cell is not cellulose but a thin membrane made of complex sugars which dissolve instantly in the digestive juices of the stomach. Because of that, Spirulina is totally digestible and is the richest food source available to us. It is also absorbed very quickly after being consumed. Because of its richness, this tiny plant is capable of providing food for humans with almost no wastage and satisfies hunger very quickly when eaten in only small amounts.

As living proof of Spirulina as a complete food, an old Japanese philosopher was claimed to have lived exclusively on Spirulina for 15 years! Doubtless, an unexciting diet, but perhaps his taste buds were a little jaded.

Spirulina is technically called a blue-green algae; its cells form into long strands which look similar to a coiled spring. And that's exactly where the name comes from. Spirulina means "little spring". Growing naturally Spirulina is found in warm and highly alkaline lakes or shallow ponds of the tropics where it is very easy to harvest. The harvest yield for any given area is equivalent to ten times more than soy beans, twenty times that of corn and two hundred times greater than for beef cattle.

As we have already said, Spirulina is very close to being the ideal food for human beings. Containing an almost perfect balance of protein, including the eight essential amino acids, it is easily digested, quickly assimilated and satisfies hunger quickly. Far less bulk is needed than any other food, and it is naturally low in cholesterol, calories, fat and sodium. What it does contain are large quantities of carbohydrate in the form of glycogen and some sugars. It has a total of nine important vitamins and at least fourteen minerals which are bonded to the amino acids (this makes for quick and easy assimilation by the body). Going back to harvesting foods, Spirulina, grown in an area of one acre, could provide food for **400** people per year. This compares very well with other high protein crops. Soy beans, for example, grown in the same area feed **16** people and rice feeds only **2**.

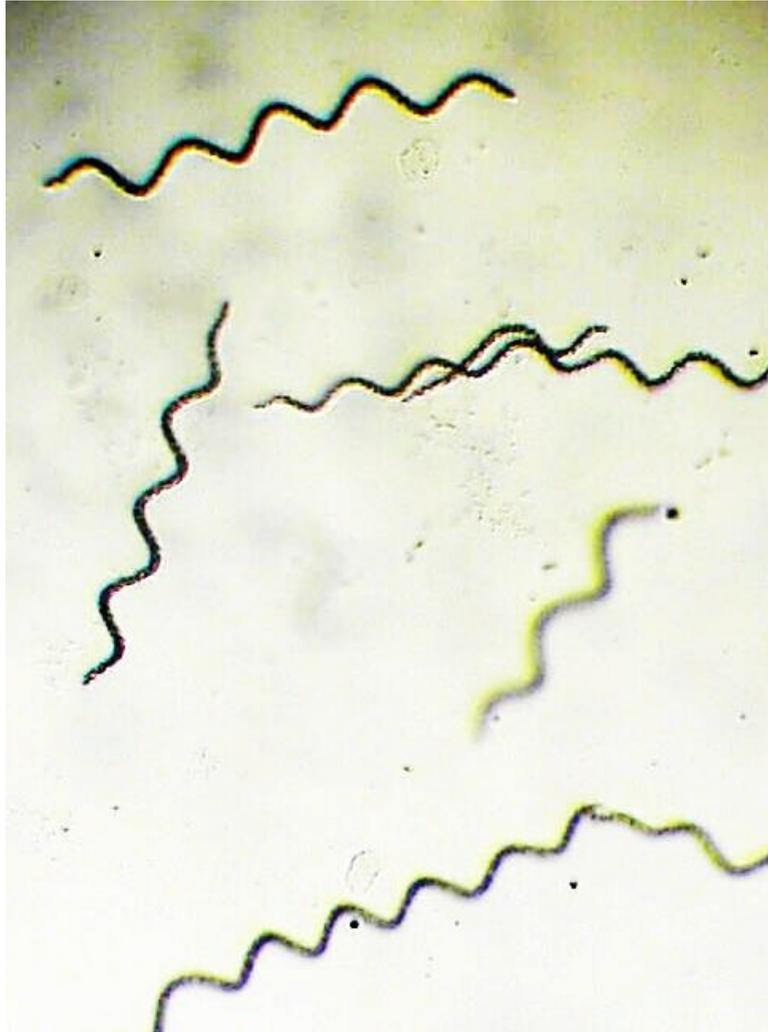
## First Food

Algae were the first life form on earth. Algae can reproduce itself. The dying algae delivers the nutrients for the new growing algae.

Other life forms developed and they fed on algae. Algae is not only the main food for other living things but also produces oxygen as a by-product, while growing.

The algae always was and still is the main source of oxygen production. It is estimated that 70% of the total free oxygen on our planet is produced by algae.

Spirulina as a food source was known by the natives in Mexico and in Africa, where the largest Spirulina lakes are around Lake Chad - others are in East Africa, South America and China.



Clearly visible the spiralling algae *Spirulina maxima*.  
I photographed this at the “Australian Spirulina” farm in the Northern Territory

## Spirulina as Food for Humans

The first written records of the food source go back to the year 1524. Fray Toribio de Bonavente reported that the Aztecs living on the Lake Texcoco ate a blue-green cake called tecuitlatl. The *Spirulina* algae growing in the lake is the sole ingredient of the cake. Other reports claim that the dry *Spirulina* was made into bread which tasted something like cheese and it was mixed with some grain ingredients and put into chilmolli, a sauce made from tomatoes and various spices including chilli pepper.

The Myans of Central America were the first to cultivate *Spirulina* in a network of waterways. The water containing the *Spirulina* was also used for irrigating and at the same time fertilising their crops.

The Kanembu people who live in the area of Lake Chad in Africa have, up until recently, gained their main protein source from Spirulina.

The wind pushes the algae to shore where the thick mats are collected by the Kanembu women using fine woven baskets. The Spirulina sludge is then brought to the sandy dunes of the lake where the water drains easily into the sand. The hot tropical sun quickly dries the paste into a biscuit which the natives call dih'e.

Millet, a daily food in this area, is served with a dih'e sauce which is made in a similar manner to the Central American sauce from Spirulina, tomatoes, spices and chilli pepper. The Kanembu people eat Spirulina for 70% of all of their meals and use approximately 10-12 grams per person per day.

Spirulina is easy to harvest, since it is a fairly large algae. In commercial spirulina farms, the water is pumped into basins lined with fine filter sheets. The sludge is then immediately brought to the drying facility.



Harvesting Spirulina.  
Bell Huang, Manager of *Australian Spirulina* farm  
at Karama, Northern Territory.

## Commercial Spirulina

The first Spirulina on the market other than in areas where the natives used it for their normal diet, came from Lake Texcoco in Mexico. At this time the Spirulina was regarded by the soda manufacturers at Lake Texcoco as an undesirable nuisance blocking their manufacturing equipment. Spirulina was burned as a form of disposal.

The first dried Spirulina product available was in health food stores in the United States in 1979. With a strong, increasing market due to positive results in slimming, Spirulina from Lake Texcoco quickly changed from a waste product to a highly demanded health food. Mexico soon sold out and Spirulina pioneer, Larry Switzer, soon started the first commercial Spirulina farm in California. This farm is, up to the present time, the world's largest commercial Spirulina production plant. It is now owned and managed by the Japanese company DIC. Larry Switzer, founder and original owner of this plant is also author of the book, *Earth Food Spirulina*. The second commercial Spirulina plant was established in Hawaii; other farms are now in many countries.

## Australian Spirulina

Apart from my own small-scale research in Spirulina growing at home, it was always my vision, that someone grows Spirulina on a commercial scale here in Australia. Australia with its clean environment, many areas of very alkaline and mineral rich ground water and plenty of sunshine seems to be the ideal place to grow the highest quality Spirulina.



Manager Bell Huang of Australian Spirulina (left) explains to the author of this book Harald Tietze (right) how Spirulina is grown by a unique and patented method developed at the farm.

## Spirulina is not Spirulina?

Spirulina is no exception to other food; it varies in quality seasonally due to a different concentration of sunlight and also due to the minerals and nutrients in the water. Another factor in modern times is pollution, which is a negative factor in Spirulina production. One does not have to be a genius to figure out that Spirulina produced near one of the biggest and most polluted cities in the world like Mexico city is likely to have a higher content of toxins in the end product than Spirulina produced in a South Pacific island like Hawaii or in the outback of Australia.

But even if there is a *five-star* algae floating in the water, that doesn't mean that we have a *five-star* product on the shelf in health food stores.

Harvesting, drying, tableting, packaging, the container and also the time factor can change the best super food to a product without value. The time from harvesting to packaging is important as oxygen degrades Spirulina and a long production time could result in a low quality product. Of course the manufacturer has to go the golden middle way since fast and very high heating of the product could destroy more valuable beta-carotene than the longer time span.

Tableting of the dried Spirulina powder and use of a binding material by the manufacturer could also have an effect on the quality of the product.

I was told by the manager of the Australian Spirulina farm that there are no binding materials used in their Spirulina tablets, due to a double-pressing manufacturing process.

Another quality risk is the shelf life and with that the packaging. One of the main reasons people buy Spirulina is its high content of beta-carotene. Spirulina, when it grows in the water, is a producer of oxygen. Oxygen, on the other hand, can destroy the beta-carotene in the Spirulina when it is being packaged. Oxygen digests the beta-carotene in Spirulina. Oxygen is a very small molecule and is small enough to go through plastic to destroy beta-carotene. Beta-carotene can vary in quality. Natural beta-carotene as in Spirulina is in its natural balance and easy to digest in our bodies. Unlike synthetic carotene, the carotene in Spirulina is not stabilised by the preservatives. To protect high-grade Spirulina it should be packaged in oxygen resistant material.

Even if you buy Spirulina in the best oxygen tight container, every time you open it, oxygen comes into the container and lowers the quality of the remaining contents. It is advisable not to buy bottles of more than 500 tablets, or transfer a quantity of tablets to smaller bottles, and keep the big Spirulina bottle in the freezer, this will protect its valuable nutrients from attack by oxygen.

Another factor which should be considered when buying Spirulina is the additives to Spirulina, not only the binder in the tableting process but also the additives to *stretch* Spirulina.

Due to an article in a major newspaper in the United States with the heading, *Safe New Diet pill*, Spirulina became very popular. The market came under pressure. The result was that from only one Spirulina product originating from Mexico, within six months 35 brands were suddenly offered on the shelves in health food stores. From 18 brands tested five had **no** Spirulina at all, only other green material like wheat grass, and eight of the products had less than 50% Spirulina in their product. Within this six-month period the price of bulk Spirulina skyrocketed from \$5 per kilo to \$36 per kilo.

Analysis reports provided by the manufacturer are typical *analysis reports* and do not say if the test was done before or after manufacturing. Since all the other publications in regard to Spirulina are written by people involved with manufacturing and marketing Spirulina, who therefore have a vested interest in positive figures, I decided to make independent laboratory tests for the most common brands of Spirulina on the market from time to time. Test results can be obtained free by sending a stamped self-addressed envelope to the address on the inside back cover of the book.

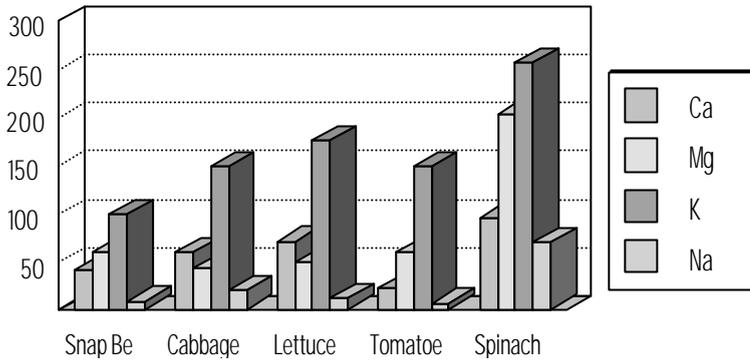
Not only in regard to Spirulina, but for daily shopping, we should really think a little bit more about what we are really buying. Sadly, some advertising borders on the illegal, in order to benefit big business rather than to be of service to people. Do you know what organic or natural means? Really not much. Natural means nothing else but that it comes from nature and the question is only “what does not come from nature? - in the end everything comes from nature, we only process or manufacture it. But even if we don't go so far and only look at the vegetables and fruit that we buy, there's still a big difference in quality without even considering herbicides and pesticides in the food. It is similar with organic food. Which food is not organic? And when it is mixed, as in the case of some Spirulina manufacturers mentioned above, one has to ask what is the percentage of organic matter to call it organic if it is not organically grown?

Only a few weeks ago I bought one of my favourite drinks, passion fruit. With this special pleasant taste in mind I started drinking it and only tasted orange juice. The label showed in big letters, passion fruit drink, in small letters, the contents of the bottle which was 3% passion fruit juice, 40% orange juice, the rest water and all the other additives usually in this kind of drink. I think the only thing we can build on is a 100% pure product and certified by independent professionals. In regard to Spirulina there is at the moment only one 100% organic certified product on the market.

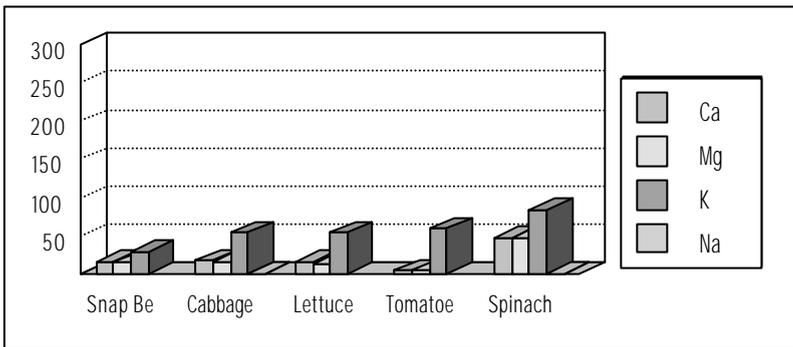
Spirulina has one big advantage to other foods since it grows in an extreme environment. Spirulina grows in very alkaline water where no other plant can grow. That is also the reason that Spirulina farming does not require pesticides or herbicides. Compared to other agricultural production Spirulina farming, in the long term, is the best and safest method to produce healthy food without destroying the environment.

The following tables show the nutrient difference between vegetables grown organically and these grown by other methods. Similar figures for Spirulina are not yet available.

## Organic is Better.



**Organic grown vegetables.**

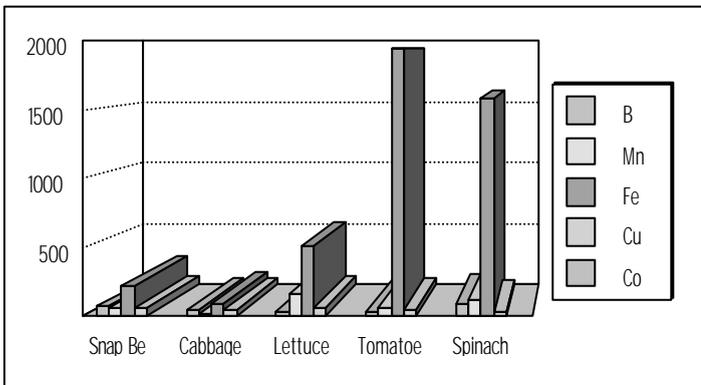


**Vegetables grown by other methods.**

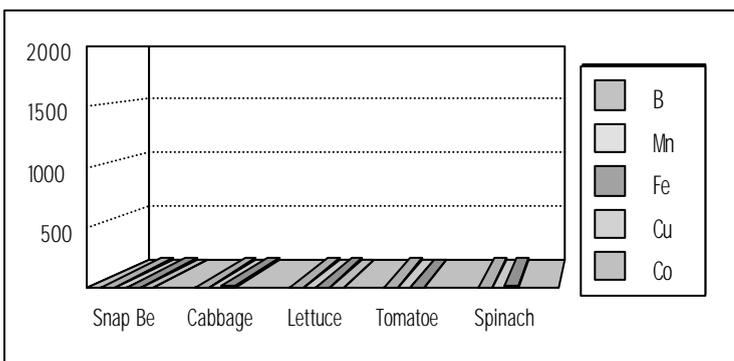
Ca = Calcium. Mg = Magnesium.  
K = Potassium.  
Na = Sodium.

Data based upon F E Baer report for Rutgers University.

Trace elements - parts per million  
- dry matter.



**Organic grown vegetables.**



**Vegetables grown by other methods.**

B=Boron. Mn=Manganese. Fe=Iron.  
Cu=Copper. Co=Cobalt. Data based upon F E Baer report for Rutgers University.

## Natural and Processed Foods

Now that we live longer (hopefully), and wish to stay healthy for as long as possible, our attitude towards diet and exercise has changed markedly to what it was years ago. A busy working day frequently ignores the need for eating in a relaxed manner. This results in an unbalanced diet and little spare energy available for that extra drive when needed. Eating out for social or business reasons often denies us the ideal food intake we should enjoy; seldom are these occasions relaxed and worse, they may even cause the intake of foods which inhibit the absorption of some vitamins. To cope with these health disasters, we take vitamin pills.

In theory, tablets or capsules which are used to supplement our vitamin, mineral or fibre intake, can come very close to fulfilling the body's needs. In practice however, we know that the human body has a distinct preference for natural foods which it handles much better, even if at times these foods are less efficient. Naturally grown foods are known to contain traces of obscure nutrients which science knows little about. We realise the value of things like lutein, flavones and phenols, but how they work, and to some extent, exactly what they do is far from being well understood.

Manufacturers could well produce the *total* pill, which would cover all our nutrient needs. The pill would have to be large, and taken daily in large numbers. But such a pill would still not provide *everything* the body requires, and certainly would be no substitute for a nicely prepared meal served in pleasant surroundings with the appropriate company.

## Super Food

The main purpose of food is to preserve our health and life. Good flavour so as to enjoy food is only secondary.

Food with high energy and high digestibility is the favourite food for athletes. The oldest reports in regard to food for athletes go back to the Aztec Emperor, Montezuma, who loved to eat fresh fish. The problem was that the emperor's palace was around 180 miles away from the fresh fish source in the Gulf of Mexico. Marathon runners were used as transport to get the *catch of the day* onto the emperor's table. It is said that athletes could run up to 100 miles per day if Spirulina formed the main part of their diet. Spirulina is a very concentrated, high protein food and the runners had to carry very little weight to travel long distances and used only water to mix up the super food which gave energy and endurance.

'We are what we eat' is an old saying and the following list of items (in descending order) is the items on our *food hit list* purchased in Australian supermarkets. I don't believe that other western countries are much different. The list was published in the *Retail World*, an Australian grocery magazine.

## The biggest selling items in Australian Supermarkets.

1. Coca-Cola, 375 ml
2. Coca-Cola, 1 litre
3. Coca-Cola, 3 litre
4. Diet Coke, 375 ml
5. Cherry Ripe
6. Nestle's condensed milk
7. Tally Ho cigarette papers
8. Mars bar
9. Kit~Kat
10. Crunchie Bar
11. Eta 5-star margarine - salt reduced
12. Heinz baked beans
13. Double-Circle tinned beetroot
14. Diet Coke, 1 litre
15. Bushell's tea
16. Cadbury Dairy Milk chocolate
17. Pepsi Cola, 375 ml
18. Coca-Cola, 1.5 litres
19. Kellogg's corn flakes
20. Maggi two-minute chicken noodles
21. Generic brand lemon drink
22. Panadol tablets, 24-pack
23. Meadow Lea margarine
24. Generic brand lemonade
25. Mrs. MacGregor's margarine

I don't think that I have to comment much on this list. Everyone can see what advertising can do. My question is only, where is healthy food, or perhaps a better name, real food?

Do you wonder that a painkilling tablet belongs to the 25 most purchased food items in Australia? I don't, when you see our favourite foods. I wonder when people will start to learn to think for themselves.

*“Eat to live  
but don't live to eat”.*

# Health Food

We all know that we should eat healthier food with more vegetables on our table. Even if you aren't among the people who comprise the statistics in the most purchased items as in the list above and you eat a lot of vegetables (fresh and good looking of course), you should ask yourself the question, is this a good vegetable? Of course you think so, but does it come from a greenhouse or from a hydroponics manufacturing plant? There's a big difference in the quality of vegetables. Greenhouse plants don't get enough sun and don't produce the same vitamins as plants growing in real sunlight. Hydroponics plants mostly grown in greenhouses as well, have no proper sunlight and also only a very limited content of vitamins, minerals and trace minerals as the table above shows.

Healthy food needs sunlight. Humans need sunlight as well and I remember that children have been told to go for a certain time every day in the sunlight to stay healthy. An old Italian saying is, *'When the sun doesn't come the physician has to come'*.

For the last decade or two skin cancer has grown at an alarming rate. The sunburnt country of Australia is on top of the list. The sun and the ozone hole is blamed for it. The UV ray intensity is broadcast every evening in summer on TV to make people aware of the danger of the sun. On a cloudy day the UV radiation is much lower than on clear days. The new teaching is NO sun. Education in schools is of great concern over the last few years where children learn in the first place of the negative effect of the sun. The life giving and health maintaining energy of the sun is often ignored or overlooked.

I have a few questions in regard to skin cancer. Statistics show that the skin cancer rate is highest in the big cities of Sydney and Melbourne and in the Hunter Valley.

Consider that the smoke cloud of big cities could give protection against UV rays but on the other hand there is also the highest incidence of cancer unexplained. One exception is the Hunter Valley with its coal mining industry and related pollution.

Why is the skin cancer rate in the highest mountains, farming communities, fishing villages and so on lower than in the cities?

Why is the cancer rate in animals not increasing in the same proportion as in humans? Animals warm up in the sun during the morning and afternoon, however in the heat in the middle of the day they are relaxing under shady trees and have always done so and will continue to do so in the future. Who is to blame for skin cancer? The sun and ozone hole or the air pollution, man-made radiation and the ignorance of ourselves overriding our own subconscious warnings when baking in the sun. If we cannot read our own subconscious mind any more perhaps we should learn from the animals. We need sun to be healthy. We need it in the right doses not only for our skin but also for our whole well-being.

*“Control the risk factors before they control you”*

# The Sun Food Spirulina

Spirulina has its highest qualities when it gets as much sunlight as possible. Land areas high in sunshine and nearly no cloud the year round are therefore the best places to grow Spirulina. Spirulina has a thin and soft cellular membrane which is responsible for its high digestibility. The tiny algae gets its own sun-protective defence from the higher beta-carotene production in intensive sun. If Spirulina gets more sun it is richer in beta-carotene. The hotter and stronger the sun shines at the location of the Spirulina production farm, the better the quality of the product. Spirulina is a dried whole food / health food in its natural balance. Healing with Spirulina is healing with nature's simplest food.

Only nature and yourself can cure the diseases of modern man; nature simply because we are nature. Hippocrates said '*Nature itself is the best physician*'.

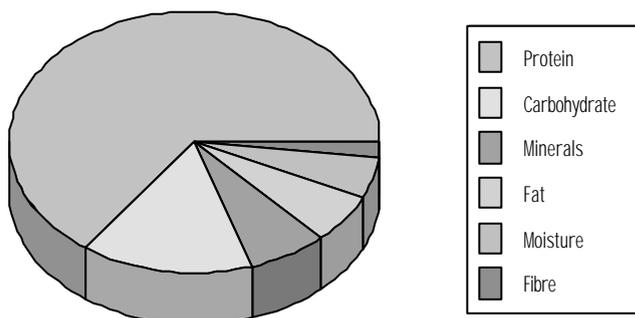
Modern chemical treatment can only help for a moment to bridge the valley but cannot sustain health.

## Total Food - Whole Food

Spirulina is a total food so people can live for a long period of time on Spirulina alone. Toro Matsui, an old Japanese philosopher, in the mountain retreat of Mt Hakone near Tokyo, is living proof that Spirulina is a whole food for human nutrition. It is reported that he lived for 15 years solely on Spirulina grown on his own waste. For space trips, Spirulina may be the best, if not the only solution.

### Percentage composition of Spirulina.

average may vary due to growing conditions.



Since Spirulina is a concentrated whole food, it is easy to incorporate Spirulina in food preparations, especially for children who don't like vegetables.

## Dosage - how much should I take?

An old saying is *'The dosage makes the poison or the medicine'*.

Even if there are people who lived for many years on Spirulina alone, and if astronauts lived on an 80% Spirulina diet it doesn't mean that we should make Spirulina our sole food. I personally never liked one-sided diets. When you talk to very old people about what kind of diet they used to become old and healthy they all have one answer in common; they never had a special diet, rather they have the answer: *they eat everything in moderation*.

Of course there could be some reason for eating Spirulina as a sole food in the far distant future. With the growing population of the earth or in the case of atomic war, Spirulina could be the only and the last food.

Incorporating Spirulina in the diet, an intake per day of 10 grams per adult is widely recommended to maintain health.

One has to find out for oneself when supporting treatment of serious disease how high one would like and/or can go in the daily intake of Spirulina.

## Does Spirulina Have Negative Side Effects?

Again the dosage makes the poison or the medicine. An overdose of anything can have negative side effects. It was only a few weeks ago that a TV channel broadcast in the news that somebody died from an overdose of water. Since I am interested in water treatment and also wrote the book *Water Medicine*, I did a rare appearance in front of my TV set. I wonder how far reporters can go to get higher ratings so that more people watch their program. The story was of a young woman who drank seven litres of water and died soon after. Only at the end of the story was it explained that she took an overdose of drugs and then drank the water to flush the toxins out of the body to survive. I think one does not have to be a genius to figure out that the young woman didn't die from an overdose of water but from an overdose of drugs.

Introducing Spirulina to your diet could have side effects with some people. Reactions will normally only last for one or up to three days. Some very sensitive people could have, in rare cases, a longer time of detoxification effect. It is also called healing crisis in that it first becomes briefly worse before it gets better.

### **The side effects could be:**

Upset stomach, feeling a bit sick, hiccups, mild diarrhoea.

Nausea and constipation could come from gastric over acidity and poor digestion.

Feeling hungry, dizzy and low on energy could be side effects in people who suffer from hypoglycaemia and anaemia.

Slight fever could be a reaction of the body's metabolism. Spirulina is a concentrated protein and could increase body temperature.

Excitement and sleeping problems could come from the fact that the body burns excessive fats. It is advisable in these cases to take Spirulina only in the morning.

Headaches could come from a poor digestion and is normally only a very brief and rare healing crisis.

Perspiration. Detoxification goes through the lung, the skin and the stools. During the detoxification, perspiration can change for a period of time depending on the level of toxification.

### **Spirulina in its natural balance is a nutritious health food.**

There are no negative effects of very high dosages known since it was taken over a long period of time as a sole food by many people. It is a concentrated whole food. It is organic food and this is the difference to other vitamin concentrates. Most vitamins available from the shelf are synthetic and if taken in high dosages can have negative side effects such as with synthetic vitamin A which can lead to hair loss, blurred vision, liver damage and headaches and with synthetic vitamin D which can interfere with the functioning of our muscles including our heart and can lead to a build up of calcium deposits. The body's own production of Vitamin D while sunbathing cannot create an overdose of Vitamin D but synthetic supplements can do so.

*“If you walk two steps towards Nature,  
Nature would come  
four steps towards you”.*

*“A diet is a penalty for exceeding the feed limit”.*

# Spirulina

## Drug or Food?

*“One can preserve our health and life by eating good food only but not by eating drugs only”.*

Whether something is a drug or a food is more or less a legal matter. I know that many people don't understand the laws in some western countries. The situation is that a healthy food could become a drug with all the legal consequences and high costs if there are claims in regard to health benefits. For example if there is a book explaining about the benefits of Spirulina sold in connection with a Spirulina product, Spirulina could become a drug and could become too expensive for many people. In the US it is recommended by the FDA that the literature is placed at least 3.5 metres away from the product, if this literature could *mislead* customers. The regulations in Australia and other countries are similar. I know of other goods where the product became illegal only because of the name mentioned in a publication. By changing the name of the product but not the contents of the packaging, the product is still really distributed. On the other hand, everyone can produce this particular herbal mixture that I have in mind themselves. Health food stores sell the ingredients, and if one knows the recipe, one can then make one's own mixture. All the ingredients are legal. I do not understand that regulation, do you? Is the name on the label a drug or is it the product itself that is a drug?

The law goes through very complex and, for me, hard to understand procedures to determine if something is declared a drug or a food.

For me it is very simple. A drug is something that people take to help for a certain period of time in disease, like a painkiller against pain. The food is something to preserve our health and life - to maintain a healthy body. Surely food is also for our enjoyment because of its good taste. The third category is complete food which is food on which we can exist solely. One, of course, needs water as well. Water is not a food. Food creates heat in the body, water is only a carrier of nutrients, waste etc.

Spirulina is a **whole food**. One can live on whole food or as some say, total food, like barley, rice (whole rice) and one can even be healthier with whole foods than with our common food intake in western countries. When you look at the list of the 25 most purchased grocery items in Australian supermarkets perhaps you don't wonder why we are not as healthy as people living on only a few handfuls of rice per day only. Healthy food like Spirulina is not a drug even if many maintain or regain health as fast or even faster, as they perhaps do, taking a drug. If with the healthy food, health is quickly restored, then that only is a sign of healthy food - real **healthy whole food in its natural balance**.

Not every so-called health food is in my opinion healthy food. Some vitamins, as well as other substances, can easily have long-term side effects if they are synthetic and out of their natural balance and/or highly concentrated like essential oils.

Spirulina is a complete food since people can live solely on Spirulina, at least for a certain period of time, without negative effects, as we know from quite a number of people and from *space food* research.

A test to see if something is a drug or a food does not need millions of dollars of expenses. To cut a long explanation short I would not see it a problem to live for a few months on Spirulina only, and drinking water of course, but I see problems for a person living for a couple of months on painkillers or other drugs only.

## Spirulina as a Food Additive

*“Health is harmony, disease is discord”.* Aristotle

Spirulina rose to commercial heights in the early 1980's when many people, always seeking a new slimming aid, created huge demands for this newly discovered plant. Many companies suddenly added this product to their list and prices for the raw material rose sharply.

After all the shouting and excitement had died down, sales of Spirulina quietened although not to what it had been in the past. Many more people were now aware of this wonderful little plant, so a reasonable level of demand remained. New uses were found to be successful, so topical applications, food colouring, weight loss programs and the inevitable food additive came into being. Spirulina was widely used to colour anything from spaghetti or chewing gum, to chips and even toothpaste.

Many foods aimed at the juvenile market were advertised as containing the delicious Spirulina with its pretty blue-green colour. Add it to milk shakes, jellies, biscuits or cakes. The following recipes are just a few we have found which may be of interest.

*Yes, we can cut the need for  
every second hospital bed in Western countries,  
and save 40,000 children in third world  
countries every day at the same time!*

# Recipes

Recipes as found in "Spirulina, Nature's Superfood" by H. Morgan & K. Moorhead.

## **Spirulina with fruit juice**

You probably want to begin with a teaspoonful of Spirulina mixed with fruit juice in a blender or with an electric mixer. Apple, pineapple or papaya work the best. You can increase the amount of Spirulina to suit your taste and your personal health program.

## **Spirulina smoothie.**

Half a cup of yoghurt, one cup soy milk or cup of fruit juice (apple, orange or pineapple).

One or more of the following: 1 papaya, 1 peach, 1 mango, half a cup of boysenberries or raspberries, 1 teaspoon Spirulina.

Blend all ingredients.

## **Another Spirulina smoothie.**

1 ripe papaya, 1/4 teaspoon cinnamon, 1 teaspoon Spirulina juice of 1 lime. Blend all ingredients.

## **Spirulina Salsa**

Simply add a teaspoon of Spirulina to a bowl of salsa. The Spirulina enhances the taste and gives the salsa an interesting colour and a nice texture.

## **Guacamole**

2 avocados, Cayenne pepper, Fresh lime juice to taste, 2 medium tomatoes, 2 cloves crushed garlic, salt to taste, 1 teaspoon Spirulina, 2 tablespoons salsa (optional), 1 tablespoon finely chopped onion (optional)

Mash avocados. Add all other ingredients and blend well. Spirulina gives guacamole a beautiful colour.

## **Avocado dip.**

1 avocado, Paprika to taste, 1 tablespoon sour cream, Tamari or soy sauce to taste, 1 teaspoon Spirulina. Mash all ingredients together.

## **Cream dip.**

4 tablespoons sour cream or non-fat yoghurt, juice of 1 lemon, 3 teaspoons tamari or soy sauce, 1 teaspoon Spirulina. Mix all ingredients together.

## **Another cream dip.**

4 tablespoons sour cream or non-fat yoghurt, 1/2 teaspoon garam marsala and 1/4 teaspoon cumin or 3/4 teaspoon curry powder. Small glove of garlic, 3 teaspoons tamari or soy sauce 1 teaspoon spirulina. Mix all ingredients together.

## **Tofu salad**

8 ounces firm tofu, 1 bell pepper (green or red), 2 medium tomatoes, 1 medium zucchini, 1 medium grated carrot, 2 stalks celery, 2 spring onions, finely chopped, 1

tablespoon tamari or soy sauce, generous pinch of basil, thyme and marjoram, hot pepper sauce or cayenne pepper (to taste), 1 heaped teaspoon Spirulina  
Mix all ingredients together. Almost any combination of raw vegetables can be put into a tofu salad.

### **Pesto (pasta sauce).**

1 packed cup fresh basil leaves, 3 - 5 tablespoons virgin olive oil, 2 tablespoons parmesan cheese, 3 cloves garlic, 2 teaspoons Spirulina, Pinch of salt, 2 ounces pine nuts, macadamia nuts, almonds, or walnuts. Blend all ingredients.

### **Rice topping.**

3 tablespoons shoyu (or soy sauce), 1 tablespoon roasted sesame seeds  
Dried bonito (optional), 1 teaspoon Spirulina. Combine ingredients and serve over rice.

### **Spirulina Pate.**

Juice of half lemon, 1 teaspoon shoyu (or soy sauce), 1 tablespoon olive oil, 1 clove crushed garlic, 1 teaspoon Spirulina

Mix the Spirulina with the garlic. Add the lemon juice and shoyu, and mix well with a fork. Stir in the olive oil. Serve on toast or crackers with slices of tomato and onion (optional).

### **Popcorn.**

Grated parmesan cheese, 1/2 tablespoon dulse flakes (or other seaweed), garlic powder to taste, cayenne pepper, chilli pepper or paprika, 1 tablespoon Spirulina.

Make popcorn as usual. Mix together any or all of the above ingredients. While popcorn is still warm, add seasoning mixture and shake vigorously so that the popcorn is evenly coated.

## Spirulina for Better Health

*“There are many ways to the top of the mountain but the view is always the same,”* is an old saying. Spirulina is a good food to maintain health and it is a good aid to regain health. For healthy people with a well balanced diet it is just another food source to add to the many other healthy foods. A healthy person with a good energy level is like a person on the summit of a mountain. You can only go to the top but no higher.

For other people with health problems Spirulina can sometimes work miracles. Spontaneous healing from pain which they have suffered from for many years is quite often reported. You find this with many other traditional healing methods and aids. We are all individuals and have all different diets. On top of this we have stress and stress is one of the main causes of illness. Stress could be from electro-pollution, family problems, too much work, noise and so on - the list is very long. In regard to food, stress can come from a one-sided diet or from preservatives in food and other chemicals we are taking, very often without thinking, like over-the-counter tablets such as painkillers, laxatives and sleeping tablets. Some over-the-counter medicines, as well as some strong herbal medicines give the body a certain stimulant. This works for a while

and does not harm when it is only used on rare occasions. Taking laxatives on a daily basis for example is like whipping a horse, it might run faster for a while but is soon more exhausted and if you use a stronger whip it gets stressed, numb and doesn't react to any more *stimulants*.

Concentrated medicine like modern chemical medicine as well as concentrated *natural* medicine should only be taken wisely. Except for financial reasons from marketing companies I cannot understand why we have this thinking problem that we have to extract the active ingredients from natural food sources only to make a new pill out of it. In my opinion modern so-called traditional or alternative medicine makes the same mistake as modern medicine or chemical medicine. When I read in advertising *all natural* when the product is an extract from a plant I sometimes just shake my head. Advertising even goes further, with claims that people for thousand of years have taken this *natural* medicine with best results in treating all sorts of illness. It is true, as herbal books report, that the herb has been used for a long time for such illness and that people have had really good successes with it. The difference between the modern herbal medicine in pills to the natural form we have been treating our problems with over thousands of years is that we used the fresh herbs direct from nature in its **natural balance**.

Herbal extracts, for example tinctures, are extracts from the total herb as well and are the second best way of using herbs. But again there is a difference in the quality of herbal tinctures when it is made with the fresh herb. If made using dried herbs then quality will depend upon how old the dried herb is. A tincture made from a low quality herb cannot be a good quality product. Make your own tincture from plants in your backyard garden or from the fields and forests fresh from the plant and you will see how effective your own product is, and form your own opinion.

Of course there are some exceptions where you have to treat the herb in a certain way or maybe store it for a certain time as with alder bark which has to be stored for a year to avoid negative side effects. When people have had good success for thousands of years with herbal treatment fresh from nature where the plant grows in its natural environment it's still a long way from meaning that we have the same success with cultivated herbs pushed to grow in quantity not quality; manufactured, extracted, put into plastic bottles with a use-by date of maybe five years or longer on the container. I think everyone has to start to think for themselves. A good way to find out the difference in quality is to have a few of your own herbs in the garden and to use them fresh for treating the problem. As well as this, they are free and you get some exercise which is healing as well. Surely there are many great products available but if you haven't done it before use your hands to work in the herbs and plant a few herbs and enjoy watching them grow and have a great feeling when you harvest them.

Using your hands to grow herbs in your own backyard or in pots on your balcony is, in my opinion, better than using your hands to open your wallet to buy a medicine.

The herbs themselves, the exercise and also your mind, will help you and in addition to the medicinal value you also have the placebo effect. I see very often from people who do not favour traditional medicine the comment, "this is **only** a placebo effect". What's

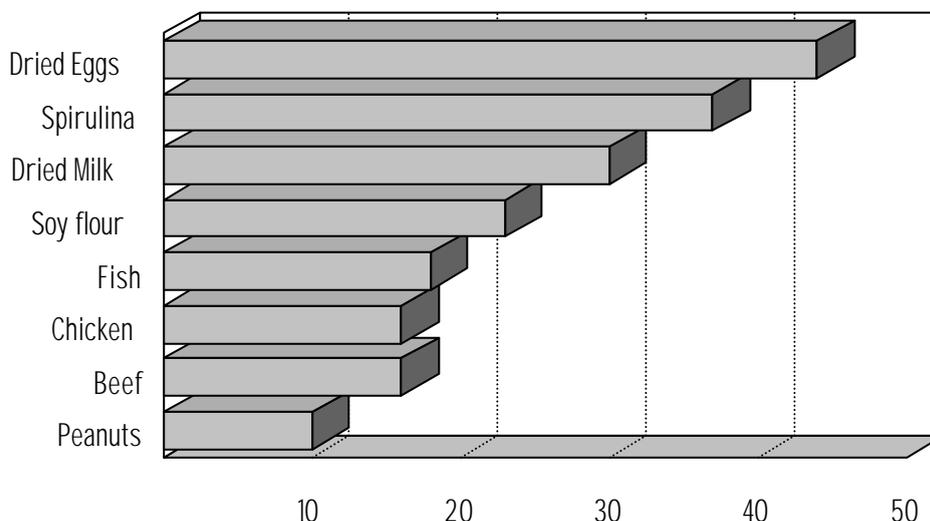
wrong with a placebo effect? The only thing that matters is that it helps. Healing with placebo only would be the best thing.

I hope I didn't confuse you too much with the negative side of *modern traditional medicine*. Surely most of the products are produced with the best intention and are available in the best quality. It would take a whole book to go through all the herbal medicines and explain why some are working and others simply can't.

## The Complete Protein

Spirulina is about sixty per cent protein. This is a much higher percentage than any other food. A complete protein is one which contains all the essential amino acids. Animal proteins for example, tend to contain in addition, calories, cholesterol and fat. Spirulina on the other hand, is about five per cent fat, most of which is unsaturated. A frequently misunderstood measurement is the quantity of protein claimed in some advertising. A food may contain a certain quantity of protein, but it can be in a form which the body cannot benefit from. So for this reason, one has to know the quantity of protein in a given product, as well as how much of that amount is available for use. Now we have two quantities: total protein and useable protein. This second quantity is the more important to us when evaluating a food.

**Available protein in some foods.**  
percentages.



*“There ain't much fun in medicine,  
but there's a heck of a lot of medicine in fun”.*

Josh Billings

## Radicals. Eh?

Well this term is not intended to refer to the extremes of any political party. Except that the building blocks of cells of plants and animals are called molecules. Then in simple terms, a radical is a part of a molecule. However, when the radical is separated from its partner in a molecule, it becomes chemically unstable, and thus highly active. In this activated state, the radical will cause extensive cell damage by stripping whatever particles it needs from cells to restore its own chemical balance. The body naturally releases free radicals in its daily functions, so there is a need to have these little particles, but too many of them, or perhaps not enough will give rise to problems which may develop to further troubles within the body.

Antioxidants are, if you like, the opposite to a radical and will combine to form a harmless molecule. If our body's balance is upset by an overload of free radicals, our immune system cannot cope with the problem, then antioxidants derived from herbs and some unprocessed foods can restore the balance and bring about a return to good health. Antioxidants provide the partner for radicals, thus preventing cell damage. Examples of powerful antioxidants are Vitamin C, Vitamin E, Beta-Carotene etc.

## Vitamins through the Alphabet

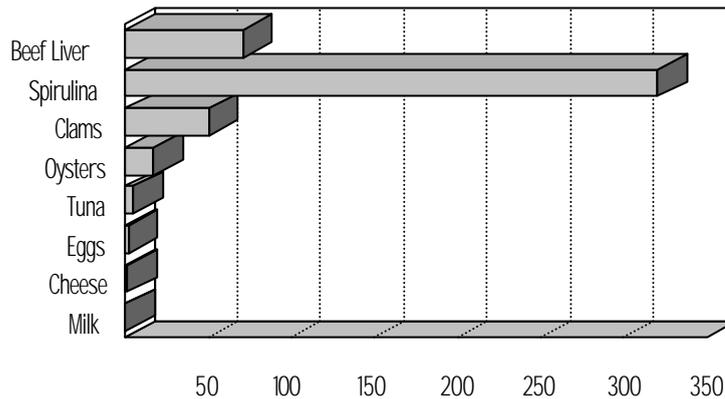
Vitamins are those things which we are told are good for us, but which don't seem to have any taste and are not sold gift wrapped. They always seem to come *with* breakfast, *with* fruit, *with* meat and *with* anything. Never alone to be disliked for themselves. Advertisers love them and think everyone else should too. Vitamins are essential foods which the body needs in small amounts, to work normally and to stay healthy. They are essential for proper growth in children, and for the preservation of good health for all.

Vitamins are commonly classified under thirteen headings, using letters of the alphabet, and are considered according to their ability to be absorbed in fat or water. The vitamins which are soluble in fat are A, D, E and K, they are usually consumed with fat-containing foods and the body can store them within its own fat. For this reason, they are retained over some period of time, so it is not necessary to eat or drink them each day. Water soluble vitamins are the B group and vitamin C. These cannot be retained in the body so we need to take foods which contain them every day.

## Vitamins Supplied by Spirulina

**B6 or pyridoxine** helps in the breakdown and assimilation of proteins. It offers protection to the heart and reduces oedema.

**Best Sources of Vitamin B-12.**  
micrograms per 100 grams.



**Biotin** is an enzyme that carries carbon dioxide and acts as an agent in the assimilation of some B complex vitamins.

**B12 or Cobalamin** is very difficult to extract from vegetables, but Spirulina is rich in this rare vitamin. The deficiency of B12 is indicated in cases of pernicious anaemia, nerve degeneration etc.

**Pantothenic Acid** is used in the adrenal glands along with vitamin C and cholesterol to produce steroids such as cortisone in response to physical and mental stress.

**Folic Acid** is essential for making new red blood cells.

**Inositol** keeps the liver healthy and balances blood cholesterol. It is probably the most abundant vitamin in the body after niacin.

**Niacin** is considered to be a cholesterol lowering agent as well as being essential to mental health.

**B2 or Riboflavin** prevents eye problems and severe eczema.

**B1 or Thiamine** maintains glucose level in the blood. A serious deficiency of this vitamin may result in death.

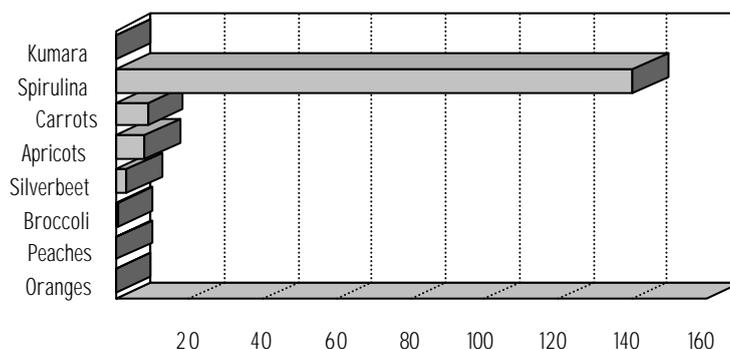
**E or Tocopherol**. Preserves heart and vascular health and retards ageing.

**Carotenoids**. Some substances in plants are not always true vitamins, but they may be something from which the body can produce its own vitamins. The carotenoid

compound of Spirulina is just such a substance. Carotenoids act as free radical quenchers, so they behave as a protector for the body's own cells.

Normally, vitamin A is available only from the liver of some animals. Since vitamin A from animals is fat soluble, the human body stores it with its own fat reserves and it is not naturally expelled when an excess is consumed. Hence, vitamin A poisoning can occur.

**Beta-Carotene** is a very important antioxidant. As we have seen earlier, there are some sources which are artificial, and others which exist within some of our vegetable foods. The latter group or natural beta-carotenes are much to be preferred since the body can absorb these much more quickly. Several studies have indicated that people whose diet contains a lot of beta-carotene tend to have a lower risk of developing cancer. Other advantages are that natural sources do not contain preservatives or colouring materials.

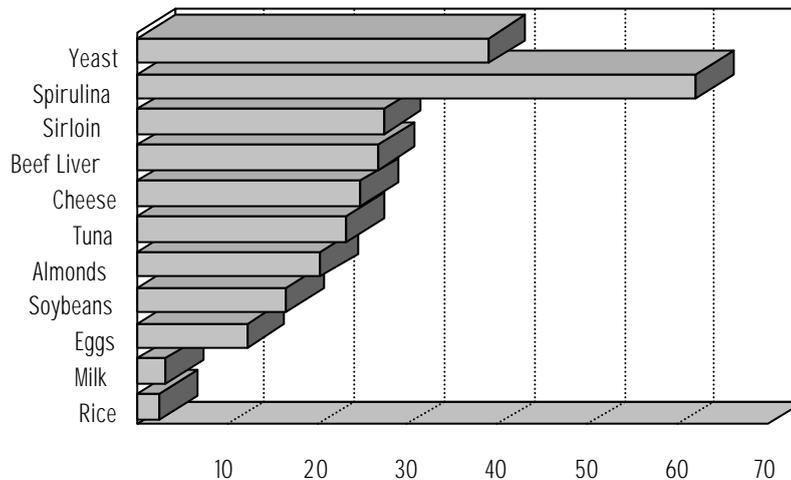


**Best Sources of Beta-Carotene.**  
Milligrams per 100 grams.

Many common foods are rich in beta-carotene and may be enjoyed for their flavour as well as their goodness. Kale and spinach with their dark green leaves, broccoli, pumpkin, carrots, squash, papayas and cantaloupes all supply this important substance. Green and yellow vegetables in general should be embraced as important foods for good health. Spirulina of course is very rich in beta-carotene, and by using it regularly you'd ensure the body was not in need of this essential food.

## Other Good Things!

Depending upon growing conditions, Spirulina will be from 65% to 71% protein. This protein content is said to be biologically complete. That means that all eight essential amino acids are present in their correct ratios. A lot of plants contain various ranges of protein, but with differing quantities of amino acids. Thus some degree of incompleteness will exist.



**Best Sources of Amino Acids.**  
milligrams per 100 grams.

Here again Spirulina is different in that it contains a total of 18 amino acids in the exact proportion to **mother's breast milk**.

It has these eight complete amino acids regarded as ideal for the human body. Regrettably, the human body is unable to store amino acids, so when *incomplete* foods are taken, there is frequently an imbalance in the diet. Spirulina can come to the rescue with its full range of *complete* amino acids. These are as follows.

**Isoleucine** (4.13%). Needed for growth, intelligence development and nitrogen balance within the body. Also assists with synthesising other nonessential amino acids.

**Leucine** (5.8%). Helps to increase muscular energy levels and stimulate brain function.

**Lysine** (4.0%). used for forming blood antibodies, improves the circulatory system and promotes cell growth.

**Methionine** (2.17%). Vital for metabolising fats and lipids that maintain a healthy liver. Also helps calm the nerves.

**Phenylalanine** (3.95%). Used by the thyroid for the production of thyroxin which in turn governs metabolic rate.

**Threonine** (4.17%). Improves competence of the intestines and thus aids digestion.

**Tryptophane** (1.13%). Enhances the use of B group vitamins, improves nerve fibres. This in its turn contributes to emotional stability and calmness.

**Valine** (6.0%). Assists with the co-ordination of the muscular system as well as contributing to improved mental capacity.

### ***Nonessential amino acids***

Another group of amino acids are termed as nonessential, and there are twelve of these. Well Spirulina doesn't have all of them, but does have ten; not bad eh? *Nonessential* means that if not present in normal foods, they can be synthesised; it does *not* mean that the body has no need of them. Again, the following list is that of the *nonessential* amino acids which Spirulina can provide.

**Alanine** (5.82%). Strengthens the walls of cells.

**Arginine** (5.98%). Important for the production of (male) seminal fluid which is about 80% arginine. Assists in keeping the blood clean.

**Aspartic Acid** (6.34%). Helps with the transformation of carbohydrates to energy.

**Cystine** (0.67%). Aids with pancreatic health and thus stabilises blood sugar etc. May help towards alleviating food allergies.

**Glutamic Acid** (8.94%). Along with glucose it fuels the brain cells. Can reduce the craving for alcohol and also stabilise mental health.

**Glycine** (3.5%). Promoter of energy.

**Histidine** (1.08%). Improves nerve relays, especially in the hearing organs. Has even been used as a remedy for deafness.

**Proline** (2.97%). A Precursor of Glutamic acid.

**Serine** (4.0%). Helps with the formation of the fatty sheath surrounding nerve fibres.

**Tyrosine** (4.6%). May slow the ageing of cells and suppresses hunger. Involved in the colouration of hair and skin, and indeed helps with sunburn protection.

## Chlorophyll - The Green Gold

Spirulina is very high in chlorophyll. It has an average of three times the amount of the *green gold* of other highly developed green plants. The dark green colour of Spirulina comes from the large amount of plant *blood* or in other words, chlorophyll, which is only one molecule different from haemoglobin in human blood and with it, a very important substance in a healthy diet. Chlorophyll in plants is collected sunlight. This “light-energy”, as Dr. Fritz-Albert Popp, Germany, calls it, is an important key factor in the human metabolism and cell communication.

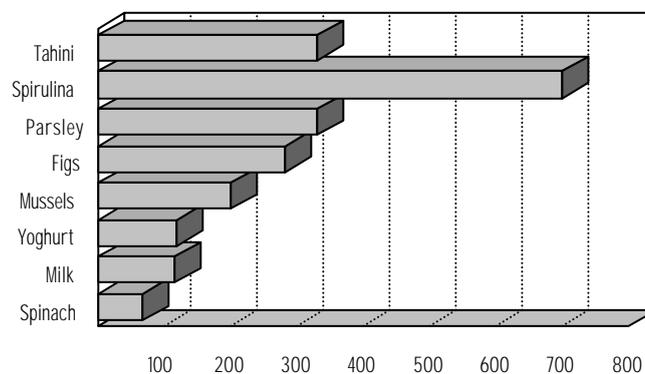
Already in 1915 Prof. Richard Willstätter was honoured for his research about chlorophyll with the Nobel Prize. He proved, that chlorophyll is able to produce living substances from dead matter with the help of the stored, converted sunlight.

Dr. Ingfried Hobert, Germany, Chairman of the *International Federation to Research and Develop Traditional Healing Methods* and author of the book “*Das Algen Gesundheits Buch*” (The Algae Health Book), highlights in his book the benefits of chlorophyll in maintaining good health. Chlorophyll is mentioned for the prevention and treatment of gastric and duodenal ulcers, acne, to strengthens the heart muscles, build up immunity and energy, as a possible anti-bactericide, only to mention a few.

## Minerals

Along with vitamins, we are always told how important minerals are. Well, to most people minerals come from rocks to form stalactites, or simply make washing water harder to wash with! Minerals really are chemical elements which we know are very important for good health. They are used in extremely small amounts however. Spirulina grows in shallow ponds which contain very high concentrations of minerals.

These ponds are very alkaline and in fact almost no other plant life can survive in this type of environment. Spirulina has the ability to lock many minerals into amino acids. By doing this, when we consume Spirulina, we receive the minerals in a form which our body can readily make use of. This next list shows those minerals and trace elements which Spirulina can provide.



### Best Sources of Calcium.

milligrams per 100 grams.

**Calcium** (1,315 mg/Kg). The most abundant mineral in the human body. Essential for strong bones and teeth. Calcium also contributes to nerve transmission ability and absorbs acids in the body.

**Potassium** (15,400 mg/Kg). Used for regulating electrolytes. A deficiency can lead to heart attack and muscular collapse.

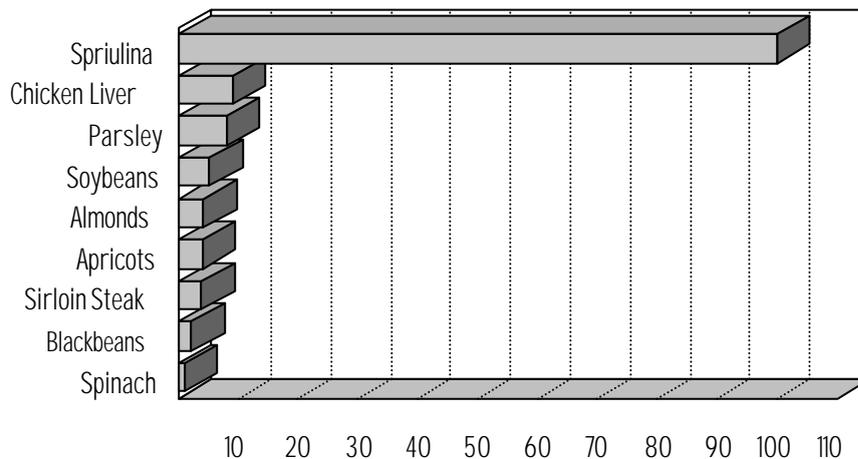
**Zinc** (39 mg/Kg). Assists with mental health, skin tone, prostate function and the ability for wounds to heal quickly.

**Magnesium** (1,915 mg/Kg). Assists with the assimilation of vitamins B and C and also some proteins. A deficiency may lead to muscular and cardiac problems.

**Manganese** (25 mg/Kg). Activates enzymes together with zinc. Helps stabilise blood sugars.

**Selenium** (0.40 ppm). Improves cardiac efficiency, reduces some types of toxicity and may retard ageing processes.

**Iron** (580 mg/Kg). Used for making haemoglobin, the oxygen carrier in the blood.



**Best Sources of Iron.**  
Milligrams per 100 grams.

**Phosphorus** (8,942 mg/Kg). Found in almost every cell of the human body, and together with calcium contributes to strong bones, and assists with digestion of carbohydrates.

# Typical Chemical Analysis of Spirulina.

Per 3 grams - one teaspoon Spirulina powder or six 500 mg tablets:

## Physical Properties:

Appearance            Fine powder  
 Colour                 Dark green  
 Odour and taste       Mild resembling sea vegetables  
                              Bulk density 0.5 g/ml  
                              Particle size 9-25 microns

## General Composition (average) Proteins

60.% Carbohydrates  
 19.% Lipids  
 06.% Minerals  
 08.% Moisture 7%

	% of Total	Mg per Gram
<b>Essential Amino Acids</b>		
Isoleucine	5.43	32.6
Leucine	8.15	48.9
Lysine	4.37	26.2
Methionine	2.22	13.3
Phenylalanine	4.35	26.1
Threonine	4.68	28.1
Tryptophan	1.41	8.5
Valine	6.23	37.4

	% of Total	Mg per Gram
<b>Non Essential Amino Acids</b>		
Alanine	7.74	46.6
Arginine	7.94	47.6
Aspartic acid	12.14	72.8
Cystine	0.93	5.6
Glutamic acid	14.07	84.4
Glycine	5.32	31.9
Histidine	2.50	15.0
Proline	4.11	24.7
Serine	4.42	26.5
Tyrosine	3.97	23.8
Total	100	600

## Vitamins

Cyanocobalamin (B12)            6.60 mcg  
 Vitamin E (d-a Tocopherol)       45.00 mcg  
 Folic acid                                0.90 mcg  
 Niacin                                    621.00 mcg

Pyridoxide (B6)	13.20 mcg
Riboflavin (B2)	99.00 mcg
Thiamine (B1)	102.00 mcg
Biotin (H)	0.969 mg
Inositol	2.04 mg
Beta-Carotene	9.00 mg
Vitamin A (as Beta-Carotene)	15,000 IU

### **Minerals**

Calcium	12.00 mg
Phosphorus	31.20 mg
Iron	3.18 mg
Sodium	21.90 mg
Magnesium	14.40 mg
Potassium	45.60 mg
Manganese	78.00 mcg
Zinc	36.00 mcg
Boron	30.00 mcg
Copper	3.00 mcg
Molybdenum	3.00 mcg

### **Fatty Acids**

(total 48 mg per gram) Omega 6 Family:

Gamma Linolenic (GLA)	30.00 mg
Essential Linolenic	33.00 mg
Dihomogamma Linolenic	1.59 mg
Omega 3 Family	
Alpha Linolenic	.0435 mg
Docosahexaenoic (DHA)	0.0435 mg
Monoenoic Family	
Palmitoleic	5.94 mg
Oleic	0.51 mg
Erucic	0.072 mg

### **Other Fatty Acids**

Palmitic Acid	60.00 mg
Myristic Acid	1.24 mg
Stearic Acid	0.204 mg
Arachidic Acid	.144 mg
Behenic Acid	0.144 mg
Lignoceric Acid	0.072 mg

### **Pigments and Enzymes**

Chlorophyll	23.7 mg
Beta-Carotene	9.0 mg
Total Carotenoids	12.0 mg
Phycocyanin	333.0 mg
Superoxide Dismutase	1.2 mg

**Others:**

Spirulina is also a rich source of enzymes, RNA, DNA, sulpholipids, glycogen, and other potentially important nutrients.

## Nutritional Information

	(6g)	6 tablets (3g)
Serving size 2 teaspoons		
Calories	20	10
Protein	4g	2g
Carbohydrate	less than 1g	less than 1g
Fat	less than 1g	less than 1g
Sodium	10 mg	5 mg

**Percent of US Recommended Daily Allowance per Serving;**

Protein	4g	8%	2g	4%
Vitamin A (as beta-carotene)	30.000 IU	600%	15,000 IU	300%
Vitamin C	0 mg		0 mg	
Thiamine (B1)	300 mcg	20%	150 mcg	10%
Riboflavin (B2)	240 mcg	15%	120 mcg	8%
Niacin	800 mcg	4%	400 mcg	2%
Calcium	6 mg *		3 mg *	
Iron	4 mg	20%	2 mg	10%
Vitamin B12	24 mcg	400%	12 mcg	200%

\*Less than 2% of the US RDA of these nutrients.

**Suggested use per day**

Powder: Start with one teaspoon daily, increasing as desired.

Tablets: Minimum of 6 and optimally 18.

**Nutritional Information:**

1 tsp. of Spirulina powder equals            6 Spirulina tablets

1 Tbsp. of Spirulina powder equals        18 Spirulina tablets

Spirulina is a low price health food when compared to the cost of the same nutrients bought in brand nutritional supplements.

## Spirulina, best value for your money.

The whole-food Spirulina may not be the cheapest food, but when you look more closely and calculate only some of the ingredients like Beta-Carotene, Organic Iron, GLA, Amino Acids, Chlorophyll and Superoxide Dismutase [SOD], you will find that if you buy them separately, you would pay approximately 2.5 times as much.

## Overdose of, or Too Much of a Good Thing

Over dosages of natural whole foods are unknown, but where extracts and synthetic supplements are used, then for some vitamins, it may occur.

In our enthusiasm to enjoy a better standard of health, or to protect against terminal disease, it is a simple matter to start taking every pill we can lay our hands on. Is this such a bad thing, we may ask. Consider the carrot juice fanatics. They drink gallons of carrot juice and eventually wonder why the palms of their hands and other parts of the body begin to turn yellow in colour. That is not really a serious problem, and it is probably reversible. But using large quantities of synthetic vitamins may bring about unwelcome results, which may *not* be reversible. The long term effects of taking high doses of synthetic food supplements is still unknown, and most doctors tend to warn against such practices.

Using synthetic: -

**Vitamin A** At about 5 times the normal dose, one may find liver damage, hair loss, blurred vision and headaches.

**Vitamin B6.** Above 400 mg a day can bring about numbness of the mouth and hands, and develop difficulty in walking.

**Vitamin C.** High doses may produce diarrhoea and stomach pains.

**Vitamin D.** Daily doses above 50,000 IU's cause excess calcium deposits, which bring about muscle dysfunction. Not good for the heart!

**Niacin.** Heavy overdoses can produce liver damage and jaundice.

**Iron.** At six times the normal dose iron may inhibit the absorption of zinc. This would reduce wound healing and bring about immune system problems

## Spirulina for General Well-being and Body Cleansing

In our time we really can't avoid eating some unwanted food additives and residues from primary production. These unwanted *additives* are all at a safe level, at least we are told so. A strange thing about safe levels is that different countries have different safe levels which are sometimes not only a few percent different but multiplied by the hundreds. Safe levels of food contamination are more a political/ financial issue that has little to do with the real effect on our body. For a healthy person whose digestion is working well, the elimination of waste occurs quite naturally. Over a long period of time the body even develops immunity. The pure and simple whole food, Spirulina, has a cleansing and detoxifying effect on our bodies. Some people have mild side effects when they start eating Spirulina such as loose bowels and gas. In these cases start with maybe only one or two tablets per day.

Spirulina is best taken with plenty of water.

Spirulina is available in powder and tablet form.

Powder is less expensive than tablets and is assimilated a little bit faster than tablets. Another advantage of powder is that it can be incorporated into the daily diet such as in fruit juice and other dishes. Some mixtures really tickle the taste buds very pleasantly and it is recommended to try some of the recipes mentioned in the book.

Most people prefer tablets for two reasons, one is the convenience and some don't like the taste in the beginning and solve the problem by swallowing tablets. The taste of course also changes with the different products.

The negative side effects mentioned earlier are only the response to the cleansing effect and are a sign that Spirulina has begun its work to detoxify. After a while the benefits of the super nutrition will show clearly. If someone feels undue discomfort a physician should be consulted. Cleansing is the first step for well-being. Other support like moderate exercise and dry brushing of the skin enhance the cleansing process. Why not walk barefoot every morning in wet grass which discharges your body's electricity and gives you free reflex zone massage on the feet? When did you last have a sauna bath with its deep cleansing effect?

Spirulina can be an important aid to better health to correct years of poor diet or abusive life style. Cleansing does not happen overnight but a long journey starts with the first step. The natural balance, high digestibility and abundance of protein, vitamins, minerals and enzymes make Spirulina a good tool to stay vital with a highly efficient immune defence so that treatment of the diseases below is not necessary.

The immune system is our main defence against viruses and bacteria. With a weak immune system our body becomes susceptible to infection related diseases, to cancer and other diseases like arthritis and diabetes. Antioxidants like beta-carotene, Vitamin E, calcium ascorbate, in the form of Vitamin C, and selenium are known to strengthen the immune system to fight against viruses including AIDS.

## The following is what people have experienced using Spirulina.

*I feel better in the mornings and have more **stamina** and **energy**.*

*And: This is an excellent product which has put the desire to live back in me. Before I started the tablets I was so miserable with pain of all kinds all over my body, **shooting pains**, tired pain in my hip, aches in my calves. I am now improved so that I can exercise, which is also good for me. My diet has not changed much nor my medication for diabetes and hypertension.*

*However, my feeling is vastly different. I have told many others and started my two sisters and a fellow worker on it. I hope they are helped by it too, although mine was no extreme case which medical doctors and chiropractors couldn't seem to help.*

*And: Your product is doing **wonders** for me and I am enthusiastically spreading the news to friends and neighbours. (M. R. P, 90 years old)*

*And: I wish to tell you how much I appreciate the introduction to your Spirulina. I first became aware of the product when I asked a neighbour what her secret was in keeping in such good shape and how she gets so much **energy**. She told me that she had eaten your Spirulina for one year, and gets the energy from this product. I was at that time in the process of moving, and was afraid, by doing all the work myself, I will hurt myself again, especially my shoulders (bursitis), and back (old age, I guess). I am 59 years old.*

*I started to eat six Spirulina tablets daily, two weeks before moving. Needless to say, I got through all with flying colours, experienced strength I had not known for a long time. Thank you for making this product available to me. **I feel younger, better, stronger**, can work better with more energy. I am recommending your Spirulina to my friends, and for a good deed, I get them started with a first supply. (E.C.H.)*

*And: I'm 54 years old and had **arthritis** for many years. Since taking Deep Sea Spirulina I am amazed that the aches and pains have subsided that they now hardly worry me.*

*And: I am absolutely positive that Spirulina was the only thing which **kept me going** over the last few weeks of selling our home. I completely lost interest in food, so you can see how Spirulina helped me.*

*And: I now find that my stamina has been greatly improved, my **swimming times** are getting better and better, since taking Spirulina.*

*And: I have been under a great deal of stress and was unable to cope with the daily activities of life. But now after taking Spirulina for over six months, I am full of **energy** and have started new things.*

*And: I was in my final year of high school and hoped to go to university. I have been taking Deep Sea Spirulina for the final year and achieved a TER score of over 90.00. I am sure that because **I felt good I did so well.***

*And: Dear Harald, My name is Dave Ralph. I am a self taught artist. I started out 30 years ago, after a very bad accident. I have found since that time that I would go 3 or 4 months, sometimes 6 month, with one half of me wanting to paint, the other not. Until the halves come together, I can not paint - I would leave my painting within reach all the time. My wife is not too happy about it! To complicate matters, I suffer from **chronic fatigue syndrome.** Since taking Deep Sea Spirulina (grown in Hawaii) I can now paint all day, every day, starting at 5 am.*

*And: I was at the South Coast and a friend gave me Spirulina. I was in pain for nearly 4 years. After 2 weeks taking Spirulina, I was **pain free** and still am.*

*And: Hi. Just a quick note on my experience with Spirulina. I have found that using Spirulina with a decent physical exercise schedule will produce the following results: If ingested before meals it will reduce your **weight** and produce good **muscle tone.** Ingested after meals, it will reduce bulk and muscle tone. Other than that it improves overall **performance** and stamina for work and exercise.*

*“Food is your Fate, Future, & Fortune”.*

*“There are no limitations to the mind  
except those we acknowledge”.*

Napoleon Hill

# Spirulina against certain illnesses

## **Acne**

The wonderful beauty of teenagers is often spoiled by acne in the years when children become adults. Hormonal changes, and also unbalanced nutrition are the main causes of acne. Teenagers select food by how it looks, “do my friends eat it” or “what will others think” if I eat that, and of course “does it taste good”. They do not like to hear that some foods or sweets are only good for feeding the acne so that it develops better, but not to feed the healthy body to prevent acne. Many teenagers, especially the females, buy expensive creams to treat the problems from outside or to cover up with make-up. It only makes the problem worse and disappointment and scars are the result. On top of this some of the *external treatments* have negative side effects in the long term.

The fast growing teenage body with stress and emotional problems coming from family, friends and school needs a high-grade food. Most teenagers don't want to know that acne comes from inside. Acne can be avoided in teenagers if food rich in the Vitamin E group as well as Vitamin A and chlorophyll is incorporated in the diet. Spirulina is the richest food in the above combinations. Other foods beneficial in the fight against acne are fresh fruit, with the one exception of oranges. Vegetables like beans and sprouts as well as rice (but please unpolished) should be an important part of the diet.

Acne sufferers should avoid many of the foods teenagers love so much because of strong advertising eg. cola drinks, all the chocolate-containing sweets that come in bars with bubbles, cherries and in all other forms and sizes as well as too much oil, especially if the oil originates from animals. Protein originating from animals including processed milk should be avoided as well.

More relaxation and less chemicals helps give temporary relief from pimples as well.

## **AIDS**

The immune deficiency killer disease has been spreading in the world since the early eighties. Surely, Spirulina is not a magic AIDS cure but is definitely beneficial to boost the immune system, as research with water extract of *Spirulina platensis* shows. “*The extract inhibits HIV-1 replication in human derived T-cell lines and in human peripheral blood mononuclear cells*” (Ayehunie S. Belay A. Hu Y., Baba T., Ruprecht R. 7th IAAA Conference, Knysna, South Africa 17.04.96.)

## **Allergies**

Allergic sensitivity has been reported to have been reduced with Spirulina. Decolourised Spirulina was used for children allergic to cow's milk and even soy bean formula.

## **Anaemia**

Spirulina is, after dried eggs, the second richest food of digestible protein. Protein is the main raw material of the red blood cells. Not enough digestible protein means anaemia. Of course there are other blood forming factors as well as iron for haemoglobin

including enzymes and so on. A deficiency in Vitamin B12 and folic acid will cause anaemia as well. Spirulina with its easily assimilated protein, Vitamin E, folic acid, Vitamin B6 and B12 as well as iron and copper makes it an ideal food source for patients suffering from anaemia. Good improvement is reported after two weeks and normal levels after 45 to 60 days.

It is recommended to incorporate foods like bananas, honey, liver, sunflower seeds, sesame seeds and egg yolk in the daily diet. Caffeine as in green and common tea, mate tea and coffee should be avoided.

### **Arthritis**

The positive effects of Spirulina on our health in regard to general well-being, cancer, hepatitis, anaemia, slimming, diabetes and so on has been the subject of many scientific studies. It is strange that the feedback from people taking Spirulina is that in the first place they feel spontaneous relief of pain which they have sometimes had for a very long time. The cause of the pain was not diagnosed or mentioned. The second group are people reporting that they had, within a relatively short period of time, relief from arthritis.

The following is what people have experienced:

*I am 64 years of age and have had a bone density test. They determined I have **arthritis** in two vertebrae, pelvic bone and knee joint. I was in so much pain it was hard to walk any distance and had trouble **sleeping** as I would wake with severe pain in entire right leg. When I first heard about Spirulina I did not think it would work but I was willing to give it a try. After three weeks I can now walk two miles without pain. I thank God for Spirulina and for Clara who told me about it.*

*And:*

*I just want to let you know how Spirulina changed my life. Two and a half years ago, when I was 29 I developed a **painful arthritic** condition known as Reiter's syndrome. My doctor gave me a prescription drug which only upset my stomach and gave me vertigo. By this time I was finding it difficult to sleep, let alone walk, and I was forced to quit my job. Then my doctor gave me another prescription drug which brought me some relief during the acute stage. The main drawback, besides it's exorbitant price, was that it was very hard on my stomach. I spent the next six months in a state of nausea..... I was able to walk short distances but it still hurt like hell.*

*Then one day a friend gave me some Spirulina .....after a few days something wonderful happened - I realised I had **no pain**. ..... I didn't attribute it to the Spirulina, however, I thought it was a natural occurrence. After a few weeks I ran out of Spirulina, and sure enough, those nagging aches began to return. After a few painful days, I finally hit myself on the head and said, "it was the Spirulina!"*

*Since that day, about six months ago, I've never been without them. Not only has my **arthritis disappeared**, my overall mental and physical state is better. Thanks to Spirulina, I wake up each morning feeling fine and able to do things I was afraid I would never be able to do again. What can I say? Spirulina is the greatest! (M. S. F.)*

And:

*I am a 63 year old woman, have always been very active, and still have a cleaning service where I do a lot of work myself. I've known for several years that I have the telltale signs of **arthritis**, the **swollen joints on my fingers**, and a very tender lump on one of my knuckles. I was beginning to think I would have to give up my business as I was in so much pain, especially in my hands. Also my ankles made a cracking noise when I walked.*

*A friend of mine told me about Spirulina and I thought, well I might as well give it a try. After taking Spirulina for three weeks, the first thing I noticed was that all the **soreness and pain** were gone from my hands and that my ankles didn't make a noise when I walked. After my second bottle I could work eight and ten hours straight and still no pain.*

*I was out of Spirulina after my third bottle and after two weeks the soreness and pain had returned. After starting back on Spirulina, within four days all the swelling and pain had gone. I have more energy and just feel better all over. I've stopped taking all my other vitamins. I find that taking three tablets in the morning and three at bedtime works best for me. I've recommended Spirulina to several of my friends and family members who are now taking it with positive results. I know for myself I don't want to be without Spirulina again.*

## **Cancer**

Preventing cancer would be the ideal way to go. The largest amount or maybe all of the money, spent in cancer research is used to find a cure for cancer - a medicine which destroys cancer. Wouldn't it be better to use a larger amount of the money to research cancer prevention?

Only a few months ago a study from the USA broadcast on TV said that in the year 2000 every second death will be from cancer. I can remember when statistics showed that one out of twenty will die from cancer. Why such a dramatic increase? There are some reasons why we get cancer in the first place, one is our environment. We hear a lot about global warming, air pollution, the ozone hole and so on and complain about the big industry, high tension power lines and other well published environment polluters. The media lives on reports like that but what can we really do about it?

The main environmental problems come from our own house and there are possibilities to change it. Electropollution is more and more linked with cancer and is ten times higher in most houses than outside. The bed area is very often highly electrically charged with radio clocks, electric blankets, TV's and so on around the bed and this is exactly the area that really doesn't need any charge. The body should repair itself during sleep and should not be charged with the high voltage and with it a 50 Hertz frequency and the magnetic field that comes with it.

If you are interested in reading more about how we punish our health in our own environment, our own house, and what solutions we have, it is recommended to read Reinhard Kanuka-Fuchs book *Healthy Home and Healthy Office* as well as my book *Earthrays and Man-made Pollution*.

The other group which is responsible for us developing cancer is our food. Spirulina became very popular in the research of the prevention and cure of cancer. A study at the Harvard University showed that an extract from spirulina-dunaliella is highly successful in the treatment of cancer. *"As you begin to treat with the Phycotene<sup>R</sup> (Spirulina - dunaliella extract) or beta-carotene, you begin to see a shrivelling up, a*

*death, the destruction of the tumour cell and this becomes more evident as you go to a higher concentration" said Dr Schwartz. And: "in another series of experiments we used two different types of Spirulina extracts or Phycotene<sup>R</sup> in relationship to the control tumour cells, again demonstrating that as we increase the concentration, there is a dramatic decrease in the number of oral cancer cells, oral tumour cells". Dr Shklar commented at the same press conference that he and his team compared the effects of naturally occurring beta-carotene rich algae with synthetic beta-carotene and a non-toxic treatment to the traditional toxic chemotherapy. Hamsters with cheek pouch cancer have been used as a test since the cheek pouch tissue is closest to human tissue.*

Chemotherapeutic agents, which are immune system suppressants, had an unsatisfactory result. One of the early chemotherapy agents produced even bigger tumours. While during the test period too many hamsters have been lost due to unsuccessful treatment with chemotherapy, all the hamsters with algae extract survived.

The test results at the Harvard University confirmed the principle of traditional holistic medicine that healing can only be achieved when natural balance is maintained. Healing with toxins cannot, in the long term, cure.

However, this test was performed in about 1989. L.E. Schlipalius (Betatene Ltd.) wrote me the following: *It was only an animal model and there are many reports of animal cancer studies showing positive results, but unfortunately, similar effects have not been demonstrated in humans. Dose and the method of cancer induction may play a role. It should also be remembered that carotenoids appear in humans to be preventative of cancer, not curative. The only suggestion of cure of which I am aware is for oral leukoplakia, the white precancerous lesions in the mouth which are remitted by beta-carotene.*

To aid cancer treatment papaya (papaw) extract is reported to have good effects as well as the semi-mature fruit together with the skin and seeds. Papaya is also very high in beta-carotene. The papaya leaf extract has to be made fresh since it only lasts in the refrigerator for three to four days. Lactic acid fermented papaya extract has a long shelf life.

In his foreword to the book *Papaya (Pawpaw) The Medicine Tree*, Dr. William L. Mayo said "I believe the time has now come, due to abundant anecdotal and historic evidence about cures ascribed to papaya use, for the pioneers in natural health, people such as author Tietze, to work hand in hand with the established medical community to develop medical trails to prove the value of these common sense beliefs.

In the case of papaya we now have a hundred year trickling of information in position and although anecdotal it can become a torrent of medical evidence which can not be refuted".

For further reading, this book as well as the books *Kombucha The Miracle Fungus* and *Kombucha Teaology and Guava, Medicine for Modern Day Diseases*, is recommend. Guava becomes very popular in cancer treatment since it seems to be the plant with the answer to our modern health problems. Many scientists world wide researched Guava and proved that it is beneficial in the treatment of pain, cancer, diabetes, arthritis, cholesterol, high blood pressure and others.

## **Depression**

Why are people depressed? They see everything negatively and dark. They ask themselves why do I have this, that or the other problem and have difficulty in seeing a

positive side. Other people in exactly the same situation are very happy. Depression is in the first place a problem of a wrongly trained mind. For three years I have been writing a book which will be published under the name *Happyology* and I have distributed thousands of questionnaires and interviewed countless people. I talked to people who are extremely depressed and unhappy and to others who are very happy. Re-educating the mind is surely the main step from depression to happiness. Food, as well, can make a person happy or unhappy. Everyone knows that after a rich meal and some hard-to-digest foods a person can be unhappy. Spirulina is concentrated sunlight, easily digestible and definitely a good food to help with depression. I know of a few cases where Spirulina helped in depression even with children and made a big difference within a week.

Another food to aid depression is *the old Egyptian recipe of the mummy*.

#### **Recipe of The Mummy**

Ingredients - 250g of figs, 250g of dates, 2 tablespoons of whole cornflower (or wholemeal wheat flour).

The dates and figs are put in a pot together with water, but just a little bit less water so that the water is not totally covering the dates and figs. Add the corn flour (or the wheat flour). Simmer for 15 minutes and stir well. The mummy recipe meal is also taken by old people. For depression and constipation at the same time, 5 grams of finely ground senna is added as well. The mummy meal is stored in an airtight container in the refrigerator. The dosage is not mentioned in the old recipe which became very popular in the last decades in middle Europe. Most people take 1-3 teaspoons per day on an empty stomach half an hour before meals.

Another good remedy against depression is *St. John's Wort* Tea. However, the best remedy against depression is in my opinion urine. Yes, your own urine has hormones against depression. Homeopathic drops, or fresh urine drops are taken under the tongue. For more information, the book "Urine The Holy Water" is recommended.

#### **Pain**

Pain is not always accounted for in the diagnosis. On this subject, we have the following letters.

*I am 70 years of age. At the time (I started taking Spirulina tablets) I was having **severe pain** in my knees and legs, which became much worse when I would lie down. I couldn't kneel and had **difficulty even bending my knees**.*

*Now I am able to bend my knees and even do knee bends. I am very happy to say I no longer have the pains in my knees. I am so happy I have discovered these miracle tablets. I feel so much better, not only with my knees and legs, but in my general health. (N.B.P.)*

*And:*

*Several years ago I took a prescription drug for **severe neck pain**. I stopped taking it when my sister told me about Spirulina. I seldom have any discomfort in this area now. The prescription drug was not nearly as effective as Spirulina. (N. H. I.)*

And:

*I have been taking Spirulina for six months. Mostly six tablets a day, sometimes more. I started taking your Spirulina when I had a **painful condition** in my right knee from what I thought was **arthritis**. Within two weeks I had no pain left. It also gave me so much energy. I have not been hungry between meals. I also noticed that I do not get colds and that during the 'flu season, even though I was in contact with my family who did have 'flu, I did not get it. I know that when I forgot to take Spirulina my symptoms returned. I know this natural product is from God. I recommend it to anyone. Thank you.*

### **Protection against Radiation**

The nuclear disaster in Chernobyl was a big shock for everyone around the world. The radiation poisoning spread far over the boundaries of the former Soviet Union. The long-term effect around the disaster area cannot yet be calculated. Chernobyl was the first big atomic disaster but definitely not the last. The atomic time-bombs in power plants can explode at any time, not to mention the possibility of an atomic war. Spirulina was used to help the 160,000 children with their radiation related poisoning such as anaemia, birth defects, cancer, leukaemia, thyroid problems, loss of vision and of course anything else which comes from a non-functioning immune system. Russian scientists from the Gorensky State Medical University use Spirulina to ease radiation sickness and patented the use as a medicinal food. It is reported that they isolated pre-school children, 25 boys and 15 girls, and applied only 5 grams of Spirulina daily for 45 days. All 40 pre-school children had a dramatic decrease in immunoglobulin (IgE). Elevated levels of immunoglobulin are found in Chernobyl children and is linked with the high allergic sensitivity in radiation poisoning.

### **Heavy metal detoxification.**

Spirulina is also beneficial in the fight against heavy metal poisoning, an increasing problem of our times. The research team of Dr. Loseva studied the effect of Spirulina against intense infections in the mouth, caused by heavy metal poisoning, especially lead poisoning. People with a high level of lead in the blood and in the urine showed, after taking Spirulina, on average a 30% reduction of the lead readings! According to the WHO (World Health Organisation), lead levels should not be over the maximum of 0.1 mg/litre in the blood and 10 mg/litre in the urine.

### **Cholesterol, Hypertension, Arteriosclerosis**

High cholesterol levels are linked to modern diseases such as heart attack, hypertension and arteriosclerosis. A German research study using Spirulina for a weight loss program found that weight loss runs parallel with a decrease in the cholesterol levels. Suggestions that reduction in cholesterol levels may cause the weight loss was not confirmed by Japanese research. Significant reduction of cholesterol was achieved without weight loss by normal weight people. No changes in their diet were made except that Spirulina was included in it.

## **Pancreatitis**

The pancreas supplies digestive enzymes and hormones which digest sugar, fats and proteins. Mr. Minoru Tanaka, at Kyoto Medical College use Spirulina as a dietary treatment for treating pancreatitis with good success.

## **Loss of Vision, Cataracts and Glaucoma**

*The eye is the mirror of the soul* and *the eye is the mirror of the body* are old sayings and are now with modern techniques even further developed to do diagnosis for all sorts of disorders. Iris diagnosis is the most commonly used form and is even done today with modern computer techniques. A clinical report by Yoshito Yamazaki, MD, lecturer at Tokyo College of Medicine and Dentistry clearly shows the benefits of Spirulina in eye diseases.

In the Japanese research with Spirulina and other aiding measures confirmed it to be highly effective in 90% of geriatric cataracts out of a total of 480 cases. The treatment included eye-disease related diseases such as geriatric cataracts, diabetic retinal damage (retinitis), nephritic retinal damage, high blood pressure and hardening of retinal blood vessels (angiosclerosis) (Hills).

In cases of retinal arteriosclerosis and high blood pressure good results were achieved in 320 cases. A dosage of 30 tablets of Spirulina per day was applied. Spirulina was given in some cases in combination with other medications.

The patients were given strict orders about lifestyle, especially diet and were prohibited from watching television. It was also suggested that they wear protective glasses to cut down ultraviolet radiation.

## **Hepatitis and Cirrhosis**

The liver is a key organ in our digestion. It continuously carries out chemical reactions. A healthy liver can produce bile juice, synthesise amino acids and different enzymes and coenzymes - to mention just a few functions. It has been shown in many clinical reports in Japan that Spirulina has a preventative as well as a corrective power for fatty liver and hepato-cirrhosis. After only one month of Spirulina intake a positive effect was obvious. After three months a change to the normal condition was reported.

Other foods supporting the liver are apricots, bean sprouts, cucumber, dandelion, green-leafed vegetables, lemons, raw goats' milk, papaw, healthy animal liver and more.

**Caution** should be taken with hot food, wine, refined sugar and salt.

## **Gastric and Duodenal Ulcers**

The amino acids, cystein and high content of high quality protein makes Spirulina a very good treatment for ulcers. Spirulina with its richness in chlorophyll also makes it valuable for retaining and restoring a good digestion.

The meals should be in more but smaller quantities. An old saying is *chewing well is half digested* and should definitely be followed in gastrointestinal disorders. Oranges and other acidic fruits should be avoided as well as hot food, salt, coffee, tea, tobacco and alcohol.

## Sexual Vitality

Impotency has its cause in most cases in an improper diet. Chronic illness such as diabetes may be responsible as well. The best anti-aphrodisiac is an overloaded stomach, too heavy food, too much alcohol, stress and so on. If the *workload* for the blood is too high to digest food there is not enough energy to increase marital bliss. The high content of protein and its high digestibility as well as all the other vitamins, minerals and enzymes make Spirulina a super food to improve sexual vigour. When changing the diet sensibly from a one-sided or too heavy diet to a well-balanced diet incorporating Spirulina many report as a side effect, a positive one, that sex drive has improved as well. Another interesting factor is that Spirulina has a relatively high content of arginine which is important for males. The seminal fluid is 80% arginine. (Chalem).

## Anti ageing

Under the heading *Der Dauerfrühling der Japanischen Senioren und die Mikroalge Spirulina-platensis* (The endless spring of Japanese seniors and the microalgae Spirulina platensis), Dr. Ingfried Hobert mentions in his book *Das Algen Gesundheitsbuch*, that Japan is importing cars, TV's, and Video cameras, but also imports large shipments of Spirulina. The reason for this is, that Spirulina became as popular as the best known vitamins, and with this, the turnover for the super food went within 10 years from zero to \$US 45 million. Spirulina is taken in the USA by people in the age group 20 to 40 years, to counteract the stress of their lifestyle. In Japan, 73 % of the customers are over 50 years old, 57% of them women. This is very surprising in view of other countries.

The statistics show, that these health conscious seniors take Spirulina for different reasons.

- ▼ 45% take it to counteract certain specific deficiencies
- ▼ 28% simply to stay healthy and for well-being
- ▼ 12% to have a secure base in their nutrition.

From the group who take Spirulina against certain deficiency,

- ▼ 22% take it to balance the blood sugar level
- ▼ 15% for better eyesight
- ▼ 14% for better digestion.

An old saying is, that health starts in the intestines. Many people suffer from constipation and take laxatives with undesirable side effects. The Japanese seniors do not consider Spirulina as a fashion. Typical intake is 4 gram of Spirulina per day.

Spirulina is rich in three substances known to have an anti-ageing effect. Tyrosine, Vitamin E or Tocopherol and Selenium.

- ▼ Tyrosine may slow the ageing of cells and suppresses hunger and is involved in the colouration of hair and skin which is a further anti-ageing effect.
- ▼ Vitamin E or Tocopherol Preserves heart and vascular health and retards ageing.
- ▼ Selenium improves cardiac efficiency, reduces some types of toxicity and may retard the ageing processes.

# Slimming

## Spirulina for the Ideal Weight

The desire to be slim is such a *fat market* for the industry, so much so that it is very difficult for the average *overweight* person to make a good decision. The slimming industry spends millions of dollars every year for advertising, in Germany alone 65.6 million deutschmarks (1993). Diet, fitness and *slimming products* had a turnover in the same year of 23.4 billion deutschmarks.

*“Advertising is the art of making someone think he has longed all his life for things he has never even heard about”.*

With a healthy body, having the capacity to meet its goals, the individual ideal weight must be defined. Many women make their lives difficult by frequently setting incorrect goals and trying one diet after another. Success is often only short lived or not noticeable at all. New miracle diets are constantly being offered in newspapers and women's magazines. However no-one has yet found the pearl of wisdom. There are no miracle treatments that can, for example, achieve a strong bone structure and yet still have the body of a model. One has to find one's own ideal weight. The question has to be put to people, whether they prefer to be slim and sick or healthy with their **personal** ideal weight. Being overweight of course is just as dangerous as being **too** slim. As with many other things, the aim should be to find the golden middle way between the two. Extremes on both sides will only have negative effects. A well-balanced healthy diet plus moderate exercise is the key to reach the ideal weight.

Spirulina became very popular with articles like *The Safe New Diet Pill*. Indeed Spirulina can be used for weight loss. It is low in calories and fat and is highly digestible and what is very important, it is in its natural balance. Research in Germany showed, in a double blind crossover study, that overweight people lose weight slowly but steadily with Spirulina.

There is a side effect, a positive one, a drop in serum cholesterol levels was registered as well. The daily intake was only six tablets and the researchers concluded that a higher dosage of Spirulina may result in a faster weight reduction. An important factor, why Spirulina is beneficial for slimming is the high content **Tyrosine** which suppresses hunger.

# Spirulina for beauty.

## *Feed your Skin with Spirulina.*

Spirulina is one of the most beneficial living foods on our planet, full of enzymes, protein, vitamins and minerals.

To obtain a perfect balance in our health it is a necessity to feed our bodies internally, and externally through the skin with living foods, vitamins and minerals.

The skin is a living, breathing organ that needs to be taken care of just like our internal organs. It needs to be cleansed, nourished and protected from chemicals, harsh environment and synthetic products.

In general, the skin is impermeable. Water for instance, will not go through it. When the molecular structure of an oil or an emulsion is fine enough to cross the epidermal barrier, then the active ingredients can be carried not only through the epidermis but deep into the skin and sometimes throughout the body via the blood stream. There are three main routes of skin penetration, through the hair follicles into the sebaceous gland, through the sweat glands and through the unbroken stratum corneum.

Vitamins were first used and applied through the skin after the Second World War. Ex-prisoners, who had severe deficiencies of vitamins and couldn't take them by mouth, were treated through the skin with good results. Today increasingly more medication is applied through the skin such as hormonal cream to menopausal women. The extracts from plants in the form of essential oils are also absorbed through the skin. Tests on animals have showed that after an application of essential oils, it was found in their urine, half an hour after application.

Last century, father Sebastian Kneipp, the most famous teacher of external application of medication in Europe, promoted this way of treatment to stimulate faster relief and to unburden the digestion of a sick person without losing valuable herbal ingredients in the digestive tract.

## **Spirulina is rich on organic ingredients and ideal for skin care.**

For best results, Spirulina can be used externally and internally.

### **Beta carotene.**

Spirulina is very rich in Beta carotene, which protects the skin and gives it elasticity. Together with vitamin E, Selenium and Zinc, Beta carotene helps to deep cleanse the skin in a gentle, protective way.

### **Chlorophyll**

Chlorophyll is "preserved" sunlight and very beneficial for a healthy skin, due to the cell building factor and oxygen storing ability. It is also beneficial against skin inflammations.

### **Gamma Linolenic acid (GLA)**

The body can not produce GLA itself. This ingredient protects the skin against UV radiation, dehydration and activates the blood circulation of the skin.

## **Minerals**

Spirulina is rich in natural minerals and trace minerals, which are easily absorbed by the skin and are beneficial for an optimal function of the skin.

## **Tyrosine**

The high content of the natural amino acid Tyrosine in Spirulina slows down the ageing process of cells. It is involved in the coloration of hair and skin, and helps with sun burn protection.

## **Vitamins**

Spirulina is rich in organic Vitamins and ideal for skin treatment.

However, Vitamins from other sources can be applied to the surface of the skin, either from a capsule or mixed into creams, oils, ointments, herbal infusions or fruit juices.

▼ The following are just a few of the commonly applied skin benefactors.

▼ Vitamin A has been successfully used in treating dry ageing skin and acne.

▼ Vitamin D has a healing effect on the skin, often used in ointments for burns and good for acne and pimples.

▼ Vitamin E is a natural antioxidant. It promotes the formation of skin cells, improves blood circulation and helps relieve symptoms of dermatitis.

▼ Vitamin A, B, C, E and iron are suitable as a nourishing moisturiser for dry older skin with under active sebaceous glands.

To receive maximum benefits from vitamin preparations on the skin, apply after a facial sauna (through steaming), a hot bath or strenuous exercise. The physical exertion improves the skin's absorption abilities. When possible leave preparations on for 20 minutes, then simply cleanse or blot off the excess.

**Zinc** has the ability for wounds to heal quickly.

## **Enzymes and Cosmetics**

The art of using enzymes in cosmetics has long been known.

Raw fruits, fresh vegetables and kelp are rich in enzymes and vitamins and minerals. When enzymes are applied to the skin, it helps to stimulate the life processes in the skin cells, making it firmer and fresher, with a healthy glow. For the enzymes to have a beneficial effect on the skin, only small quantities of enzymes, measured in millionths of a gram per litre are needed.

When preparing enzyme rich food for home beauty treatments, you need to make a fresh preparation each time. It is like preparing your fresh living food for your daily diet

## **Spirulina for Beauty**

Spirulina IS the wonder anti-ageing "living food".

For our busy life styles today, the following is an easy way of nourishing and treating your skin inside and out.

On a daily basis whenever you prepare your raw fruit juices or fruit smoothies, add one teaspoon of Spirulina powder to start off with.

Before enjoying your anti-ageing healthy tonic drink, take out a couple of tablespoons and apply to your face. For best results leave on for 15-20 minutes.

Then rinse off and tone and moisturise for a healthy glowing skin. What a great way to start each day. Continue the treatment for three weeks and notice the difference in how you feel and look. You don't have to believe this, you will know it.

### **Spirulina Kitchen Cosmetics**

Be adventurous when feeding your skin, it is just like your body that needs variety. You will find the food that works best for you, because every one's skin is unique.

## **Normal Skin/Combination**

### **Internal**

Increase these foods into your diet, brewer's yeast, bran, carrots, sprouts, green and red peppers, goats milk, Kefir, Kombucha, oatmeal, oranges, lemons, pumpkin, parsley, whole grain bread and cereal, rose hips, water cress. Add olive oil to diet and increase purified water and herbal teas to daily diet. Add Spirulina as a living natural vitamin and mineral food supplement.

### **External**

**Foods:** Almond meal, apple cider vinegar, bran, brewer's yeast, butter milk, cream, egg, Kefir, Kombucha, honey, kelp, oatmeal, sour cream, Spirulina, wheat germ.

**Fruit and vegetables:** Apricots, avocado, banana, papaya, peach, pear, melons, carrot, celery, cucumber, lettuce, potato.

**Herbs:** Aloe-vera, borage, clover, calendula, comfrey root, dandelion, elder flower, fennel, lavender, lemon grass, mint, nettle, rosemary, violet.

**Essential oils:** Carrot seed, camomile, frankincense, geranium, jasmine, lavender, neroli, orange, patchouli, palma rosa, rose, rosewood, sandalwood, ylang ylang.

**Infused oils:** Borage, calendula, carrot, evening primrose, rose hip.

**Cold pressed oils:** Almond, apricot, avocado, grape seed, jojoba, olive, Soya bean, sesame, sunflower, safflower, wheat germ.

Be creative, for your skin changes every day so change your formulas. Experiment with the different foods and oils as mentioned above for your skin.

What you need is time and patience; keep a record of all your trials and errors.

## The following is a basic guide to mix your personalised formulas.

### **Cleanser**

Natural yoghurt 250 g, honey 5g, Spirulina powder 3g, essential oils 0.25 ml.

Mix ingredients together. Apply twice daily onto moist skin and massage in gently, then rinse well with water.

### **Toner**

Cider vinegar 10 ml, Spirulina powder 2g, rain water 80 ml, essential oils 0.25 ml

Mix ingredients together. Shake well before each use; apply twice daily as a splash on toner after cleansing.

### **Moisturiser**

Apricot Oil 30 ml, grape seed oil 25 ml, vitamin E 1 drop, essential oils 0.25 ml, Spirulina powder 1g.

Mix ingredients together. Shake well before using for Spirulina powder sediments will separate. Use 5-10 drops massage oil into the skin twice a day after toner.

### **Mask**

Oatmeal fine 60 g, corn starch 40 g, Spirulina powder 3g, essential Oils 0.25 ml.

Mix ingredients together and add water until a soft paste. Apply with a soft pastry brush. Avoid contact with the eyes. Leave mask on for 10 minutes. Rinse with warm water, following with a toner and moisturising oil. Use once a week.

### **Fresh fruit facial**

Avocado 1/2, pure honey 1 tsp, Spirulina powder 3g, fresh cream 1 tsp.

Mix ingredients together and apply to well cleansed skin. Lie down and relax with fresh cucumbers on the eyes. Leave for 15 to 20 minutes. Rinse with warm water, then with cool water following with toner and moisturising oil.

### **Hair care Recipes**

Spirulina is rich in protein which is what the hair needs to be fed with internally and externally to maintain healthy, shiny and sleek hair.

### **Protein suds-less Shampoo**

Shampoo will cleanse and nourish the hair. without stripping the natural oil out of your hair. Can be used for all hair types.

Whole egg (depending on hair length) 1 or 2, milk 3 tbsps, Spirulina powder 1 1/2g (1/2 tsp.), lavender essential oil 3 drops.

Whisk the ingredients together until thoroughly blended. Wet hair and use as normal shampoo. Rinse off thoroughly, adding 1 tablespoon of cider vinegar or Kombucha to the final litre of rinsing water.

### **Body building shampoo**

Shampoo enhances body and shine, and rejuvenates the hair follicles.

Shampoo ¼ cup, filtered water ¼ cup, fresh avocado 1/2.

Combine all ingredients into a blender, and blend until smooth. Wet hair and apply shampoo, gradually adding warm water and working into a lather.

Rinse thoroughly until the hair is clean. Then use hair conditioner, and add 3 drops of lavender essential oils, then rinse thoroughly.

### **Protein Hair Pack**

This conditioning hair pack is suitable for dry or for chemically treated hair.

Whole egg 1, olive oil 25 ml, natural yoghurt 150 ml, pure honey 2g,

Spirulina powder 2g, sandalwood essential oil 10 drops.

Whisk the ingredients together until thoroughly blended. Apply to dry hair and cover with a plastic shower cap, then wrap in a warm towel and leave on for 20 minutes.

Apply shampoo directly onto the treatment then rinse. Reapply shampoo and rinse off thoroughly, adding 1 tablespoon of cider vinegar or Kombucha to the final rinse water.

### **Hair loss pack**

This hair pack is rich in vitamin E, protein, lecithin and essential fatty acids. It feeds the follicles with nutrients required for healthy hair growth.

Avocado oil 2 tbsp, wheat germ oil 1 tbsp, whole egg 1, Spirulina powder 1 1/2 g, rosemary essential oil 5 drops.

Mix all the ingredients together. Massage thoroughly and gently into the scalp, put on a shower cap, and wrap the head in a hot towel and leave on for 20 minutes. Apply shampoo directly onto the treatment then rinse with warm water. As the hair pack is highly emollient it may need to be shampooed twice. Use Spirulina shampoo for it is gentle and stimulates growth.

## **Spirulina Bath Treat**

Pampered and treat yourself to a nourishing luxurious aromatic bath. Evoke a vision of Cleopatra lolling seductively in her swan-shaped tub.

### **Nourishing milk Bath**

Spirulina powder 1-2 tsps, fresh milk 1-2 cups, sandalwood essential oil 5 drops

### **Soothing Oatmeal Bath**

Oatmeal fine ½ cup, Spirulina powder 1-2 tsps, lavender essential oil 5 drops, warm water 2 cups.

### **Moisturising Oil Bath**

Olive oil 1 tbsp, sesame seed oil ¼ tsp, Spirulina powder 1-2 tsps, geranium essential oil 5 drops.

### **Reviving Salt Bath**

Epsom salts ½ cup, sea salt ¼ cup, Spirulina Powder 1-2 tsps, pine essential oil 5 drops

### **Refreshing Vinegar Bath**

Apple cider vinegar, 1 cup or Kombucha vinegar, Spirulina powder 1-2 tsps, lemon essential oil 5 drops.

For the above bath treats, place all ingredients into a blender, whisk until blended. Fill the bath before adding mixture. Swish to combine, then luxuriate for at least 15 minutes while your body is being nourished.

### **Aromatic Herbal Bath**

Lavender dried herbs 1 tbsp, rose petals 1 tbsp, geranium 1 tbsp, boiling water 1 litre, Spirulina powder 1-2 tsps  
Pure boiling water on to dried herbs, cover and allow to steep for 3 hours.  
Strain and cool then add Spirulina and blend before adding to the bath water.

N.B Increase Spirulina powder in any of the above bath recipes to your body's desire.

## **Future Food**

What will we be eating tomorrow? Everyone knows that we have two problems - on the one hand too many people are starving world-wide and each day around 40,000 children die of diseases from malnutrition. On top of that the world population increases year by year.

On the other hand agricultural land decreases every year by overuse and bad land management. The deserts are getting bigger. Everyone knows that we can't continue in the way we are going at the moment. We need to understand our history to learn for the future. Problems like not having enough food for our growing population with current production methods and the fact that the food we eat has changed quite a few times since humans have been on this earth. First humans were hunters and gatherers only. With the growing population it was convenient for people to raise domestic animals and to start growing plants. Using only the seeds from the best plants made it possible for the same plants to grow much bigger fruits. Corn, for example, was only the size of the little finger and we all know the size of corn today. It is the same with nearly all our foods, vegetables and seeds that we harvest today.

The early form of agriculture had one big problem. The food production per hectare was very low and always new, fresh land had to be used to produce a good crop. This land rotation was the only solution and is still the only system used in areas like South America and Papua New Guinea. I found it very interesting in Papua New Guinea how land rotation and modern agricultural machinery, chemicals and irrigation work so closely together. On the one hand the natives clear little land areas for their garden, have good crops for two years but since they don't fertilise or make any other land improvements, it would not be worthwhile to grow crops for the third year on the same land. New land is cleared and bush reclaims the gardens. On the other hand tea, coffee,

sugar and other crops are produced with modern know-how with its negative influence on the fragile environment. Land rotation developed further, for example in Europe, where for two years crops were planted and harvested and in the third year the land was given a rest and every weed which grew by itself was ploughed under. In this way the plant matter was used as a *green fertiliser*. Around 500 years ago in the highly populated areas of middle Europe, people had approximately the same questions as today: what will we be eating tomorrow? Agriculture had to change again. From the two-year crop and one-year rest system the plant rotation system developed. In the third year mostly leguminous crops were planted to enrich the soil with free nitrogen. Other labour intensive crops were planted as well as potatoes and beets where the weeds were dug under as a green fertiliser. All the manure from the animals in the stables was stored and in autumn it was ploughed into the soil to conserve the nitrogen which would otherwise be absorbed by the sun. Permaculture was born.

In the last century agriculture had to change again. In the highly overcrowded Germany, Justus von Liebig (1803-1873) became very popular with his studies in agriculture especially with animal and plant production. With his *minimum theory* he became the father of mineral fertilisers and modern agriculture at the same time. His theory, which is still practised up to the present day, is that a plant can grow only as much as the nutrients it gets. If a plant gets 150% nitrogen, 100% phosphorous, and only 30% K, plant production would be only 30% of the possible 100% growth. Getting nutrients for the plant to the 100% level led to mineral fertilising which incorporated partly waste products from industry.

What this system does not incorporate is the effect of trace minerals in the soil on the plant - plants growing in different soils have different qualities. I think the best known example of this is in relation to the taste of wine, where people with sensitive palates can tell exactly where the wine was grown.

In the so-called green revolution agriculture changed again and with the use of herbicides and pesticides as well as the addition of mineral fertilisers, the same land produced more. This short term solution was only to get the maximum quantity per hectare. Labour intensive crops became labour extensive crops by using chemicals. The first changes in agriculture took thousands of years until the raising of domestic animals and the growing of plants commenced, then hundreds of years with the change of land rotation to plant rotation, then decades with the change to mineral fertilising and chemical herbicides and pesticides.

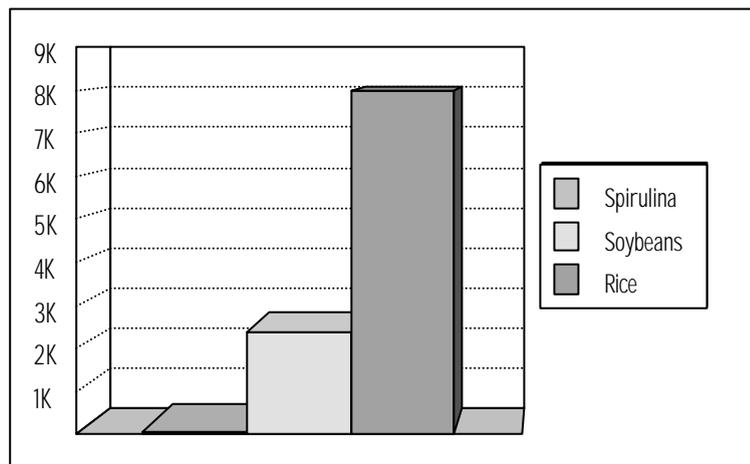
The situation at the moment needs a change. It has to happen faster than the changes over the last 50 years. Growing Spirulina is definitely one of the answers if not THE answer. The land lost to desert and the land where the forests have been cut back too much needs to be regained to make life for humans possible in the long-term future. Part of our diet has to change. The ever increasing quantity of food which humans consume has to come from the lower end of the food chain or from the first part of the food chain which brings us back again to Spirulina.

Our agriculture works at the moment on the edge of production or perhaps already over the edge.

We don't have to change our diet dramatically, at least not for the moment. Incorporating Spirulina in our diet means that we have a very healthy basic whole food which needs only a fraction of the land, water and energy than other food production. Not to mention at this moment the chemicals used as pesticides and herbicides as well as mineral fertilisers polluting our environment.

Agriculture can change again and has to change again. Agriculture has to be in the future more and more **aqua culture**. Two thirds of our planet is water and we have to work with our water area wisely. For beef, soy beans, eggs, corn, rice and other basic food we need fertile soil. For Spirulina growing we need only desert area which is non-productive at the moment and more than we wish is available world-wide.

## Land area required to grow one food ration per year.



To feed people with Spirulina only waste desert land is required, and also only a smaller fraction of the land is required to produce the same amount of food. Only 2% of the total agricultural land in the United States could feed the whole world with Spirulina. But you would not even need the 2% fertile agricultural land, you only need desert land. Using only small parts of our deserts could feed the world for a long time in the future.

Spirulina can be grown in tropical areas all year, but due to unsuitable weather conditions with too much rain and storms during the monsoon season, some farms stop production to ensure the best quality product.



**Ponds at the Australian Spirulina Farm, which are closed during the wet season.**

## Water Use

Other production of basic food needs quite a lot of water during the process. On top of that it needs a good quality of water to irrigate crops such as for corn and soybeans or as drinking water for animals. To produce the same amount of protein in beef instead of Spirulina, the water use is more than 28 times higher than with Spirulina and again not first grade water is required but only brackish water with a pH level of 8.5 to 11; water in which almost nothing else can grow except Spirulina.

Contrary to other vegetable production where the food is grown in soil, water, next to climate and environment is the main factor for the mineral rich Spirulina production.

The Australian Spirulina farm uses water from a bore. When I visited the farm I was offered a glass of this wonderful water - lucky Spirulina!

## Energy Use

The use of energy to produce food is very low in Spirulina farming. Only a pedal wheel circulating Spirulina and to get oxygen into the water is used. Further energy is only used for processing Spirulina.

# Chemical-free Food production

Chemicals like pesticides and herbicides are not used in Spirulina growing.

No run-off and environmental pollution comes from Spirulina farming.

On the contrary, Spirulina farming helps to save the environment for the future since it produces oxygen by growing. Putting green Spirulina production ponds in desert land will take the pressure off fertile agricultural land. This lessened pressure on agriculture should produce more quality instead of quantity, which benefits all of us, and food could even taste much better. When I think about strawberries back when I was a child, I still have the wonderful taste in the memory of my taste buds. In the last 10 or 20 years I thought my taste had changed because strawberries no longer tasted as good as strawberries in my childhood. Only a few months ago I found in my old garden little wild strawberries which tasted as good as they did in my childhood. The strawberries I bought the same day in the supermarket didn't taste like strawberries and if somebody had blindfolded me I wouldn't have known whether it was a strawberry or maybe a watermelon, from the taste only of course. Many foods today are produced for good appearance and a longer shelf life, like the hard strawberries, but not to tickle the taste buds. I think to find out how good fruit and vegetables really can taste, one has to grow one's own food in one's own backyard garden.

## What will we be eating tomorrow?

The micro vegetable Spirulina could be an answer or THE answer for our main problem at the time and for the future.

I receive many letters from concerned people, worrying about tomorrow's food. Is it time to think about your own private food production? It might be a question of survival to grow your own Spirulina at home!

**Spirulina is the super food of the future to save the planet and to feed the growing number of starving people in the world. Not only that, it also is considered as a solution for all the overeating illness in our modern western society. It is the oldest food on earth and the simplest food, low on sugar and low on fat.**

## Food for the Hunger in the World

The aid agencies are very active in advertising for help for the starving people in third world countries. The pictures they show of malnourished people, mainly little children, are disturbing. Surely, due to unexpected long droughts, natural catastrophes and so on, food shortage in one part or another in the world can happen. It is great that the rich countries with illness due to too much food, give food to people in need. In most areas that the foods goes to the starving is not due to catastrophes but due to overpopulation and overuse of the land. Sending food is no help in the long term since tomorrow they need more food and the day after more again.

## Spirulina, affordable for starving people?

You may ask, how can this algae save the world, if it's so expensive?

Spirulina costs next to nothing to produce if recycled, and would be the ideal solution for malnutrition, especially in the main problem areas where the deserts are expanding rapidly as for example in Africa.

**The only way to help people in poor countries with food shortage is to show them how they can produce their own food.**

A village plant would work as follows:

The waste from livestock and human toilets is pumped into a biogas digester. When I saw my first biogas digester 33 years ago I saw it as a fertiliser and fuel future in agriculture. In the biogas digester, liquid waste produces methane gas (CO<sub>2</sub>) which can be used as fuel for running the pedal wheel in the Spirulina ponds as well as for cooking or for tractors working in the crop fields. One part of the digested manure, the solids, goes to the compost and field crops. The liquid part is filtered through sand, sterilised in a solar steriliser and added to the growing ponds. Spirulina can easily be harvested with a thin woven fabric or sieve. It is then dried and consumed by humans or if there is too much Spirulina the overproduction goes straight in liquid form into a pond to feed water weeds and fish. Not only would the food problem be solved but also the sewerage problem and a dependency on energy like electricity and petrol.

**Please note**, that the commercial Spirulina, which you buy, is not grown with this method!!

The costs to build Spirulina farms are, seen long term, minimal compared to the never ending and increasing costs of feeding people.

**Let's not build weapons to kill but  
Spirulina plants,  
to save starving people  
that they can feed themselves in the future.**

The royalty from this book is invested in the development of Village Spirulina farms in third world countries.

## The now ill and starving people will be as healthy as Western society.

'We are what we eat' is an old saying. With a Spirulina diet, modern diseases like arthritis, cancer, pain, diabetes, cholesterol and high blood pressure could be strange words only.

Spirulina is the super food of the future, not only to solve the problem with starving people of the world, but even more to solve the health crisis in the western world. According to famous doctor I. Hobert from Germany, every second hospital bed is "*occupied by a patient self afflicted disease, with a "disease of affluence", meaning a person who has caused his own illness by personal wrong behaviour. Most of them seem to have the desire to kill themselves with fork and knife*".

If the now hungry of the world grow their own Spirulina and use it as a major part of their diet, their health will be much better than in western countries.

It is recommended to read the book *Holistic Healing For The New Millennium* by Ingfried Hobert, M.D.

## Growing your own Spirulina at home?

Yes, it is possible to grow your own Spirulina. Where I live, in Bermagui, on the South of NSW, the temperatures are only suitable to grow Spirulina in the summer. I did grow it in winter, but indoors, in my mother's lounge room while she was on holiday in Germany. Certainly, I only told her after she came back. To get the right temperature, I heated one big container with a heating panel as is used for Kombucha brewing and another one with a submersible aquarium heater.

To get the right light intensity for greener colour and higher beta-carotene, a growing light was installed on the ceiling. The stirring was done by an aquarium pump. To get the optimal pH level, alkaline water with a pH of 10 was produced with the "Water Activator", dividing pH 7 water into pH 3 and pH 11 water. The high pH of 10 or even 10.5 is important, since not only the algae likes this alkalinity but also to avoid the growth of unwanted algae's and contaminants. However, the culture has its highest production at a pH of 9.5. Under optimal conditions, one can harvest up to 10 gram dried Spirulina per one square meter pond.

The Spirulina grew quite well, but the costs of production under these circumstances and the high cost of the growing medium, at that time, were much higher than the value of the harvest.

Conditions are much better outdoors in summer, when the sun shines bright and the temperatures are optimal. The essential stirring can be done by an aquarium pump or by a paddle wheel. A safe place, in order to avoid "fertilisation" by dogs and other uninvited ingredients, the flat carport roof seemed to me to be the ideal place. Spirulina grows quite well under these conditions when looked after. My friends, Tina and Peter White, who actually made me aware of Spirulina and gave me the first book about

Spirulina and the first living culture, studied along with me. They live in Queensland, where the temperatures are optimal for growing Spirulina. They developed an organic fertiliser to grow Spirulina more economically. Spirulina can be grown in a bathtub or in big containers on a balcony of a unit.

However, when the use of commercial organic fertilisers and the time spent for the production are taken into account, it is still cheaper to buy the commercial Spirulina product, but one could say the same with other home grown vegetables from the back yard garden. Although, for one's own experience and pleasure, it is a lot of fun to produce the super vegetable at home.

## Plants and Animals

Whilst considering the benefits of Spirulina for people, we should not overlook the use of gardeners and veterinarians. Ageing dogs and cats will improve their sad fur and stiff joints when given Spirulina. Their general well-being improves as they show increased stamina and a better appetite.

Mrs. C.M. wrote the following letter to me:

*"Our family Rottweiler, of six years is a wonderful, loving female who guards and protects all the family. But in the spring and summer we always had a problem with her coat. No matter what good food we fed her, by the start of summer she had developed an itch and most of her coat was in poor condition and slowly falling out. After many, and different vet visits and bottles and tubes of many different creams and lotions, I was at a loss what to do. I had been taking "DeepSea Spirulina" for several years and had felt the wonderful qualities over that period, so I thought if it's great for me, then why not Tammy? I started to sprinkle DeepSea Spirulina into her food each night, it was funny to see this huge dog with green all over her mouth, she loved it! Within six weeks her coat was shining like a show dog and she had totally lost the itch. She has been that way ever since". "I always recommend it to friends and their pets".*

Note: DeepSea Spirulina is grown in Hawaii.

**Koi carp** may be fed on Spirulina to improve their colour, health and chances of winning a larger prize. Bird breeders use it for improving colour and condition of prize birds, whilst gardeners use it as an effective foliar plant food. So you can see, that while Spirulina is not exactly a new product, it does have a great deal to offer, and should be much more widely used than it is at present.

## Spirulina compared to Chlorella and Green Barley

Which is the best algae and which algae should I buy you may ask yourself when offered different products and all are the best - at least according to the sales person. You have to answer this question yourself. Compare the ingredients and the price of the product and last not least how **you feel taking the product**. Read the label with open eyes. If one tablet contains for example 500 mg 100% pure Spirulina, find maybe on the other side of the bottle how many mg are in one tablet. If each tablet has 1000 mg ask the question what is the rest you pay for. You buy a container of pure Spirulina **plus** something else.

As you know, protein for example is not protein - the digestibility is important! The following table compares a few compositions in the algae Spirulina and Chlorella and green barley.

<b>Composition (10 g)</b>	<b>Spirulina</b>	<b>Chlorella</b>	<b>Green Barley</b>
Protein	63 %	58%	25 %
Carbohydrates	18 %	23 %	54 %
Fats (lipids)	5 %	9 %	4 %
Minerals	9 %	5 %	12 %
Beta-carotene	23000 IU	5500n Iu	5000 IU
Vitamin C	0.5 mg	1 mg	31 mg
Vitamin E	1 IU	0.1 IU	3 IU
Thiamin, B1	0.31 mg	0.17 mg	0.03 mg
Riboflavin	0.35 mg	0.43 mg	0.20 mg
Niacin	1.46 mg	2.38 mg	0.75 mg
Vitamin B6	80 mg	140 mg	128 mg
Vitamin B12	32 mg	13 mg	3 mg
Sodium	60 mg	0 mg	3 mg
Folacin	1 mg	2.7 mg	108 mg
Biotin	0.5 mg	19 mg	11 mg
Pantothenic acid	10 mg	130 mg	240 mg
Zinc	0.3 mg	7 mg	0.5 mg
Manganese	0.5 mg	#	1.0 mg
Copper	120 mg	10 mg	200 mg
<b>Composition (10 g)</b>	<b>Spirulina</b>	<b>Chlorella</b>	<b>Green Barley</b>
Phycocyanin	1500 mg	none	none
Chlorophyll	115 mg	280 mg	55 mg
Carotenoids	37 mg	#	#
Gamma Linolenic	135	none	none

Source: The Medline Report - May 1997 # No data available

## Other Spirulina Products

**Spirulina shampoo, conditioner, ointment and powder**, are available by mail order from Planetary Naturals Australia Pty Ltd.

Margaret Centre, 52 Wilson St, St. Marys NSW 2760

Phone: Free call 1800650618

**Spirulina skin care products**, living nutrition for the skin are available from Kneipp Cure Pty.Ltd, P.O.Box 755, Dapto NSW 2530.

Phone 02-42611980

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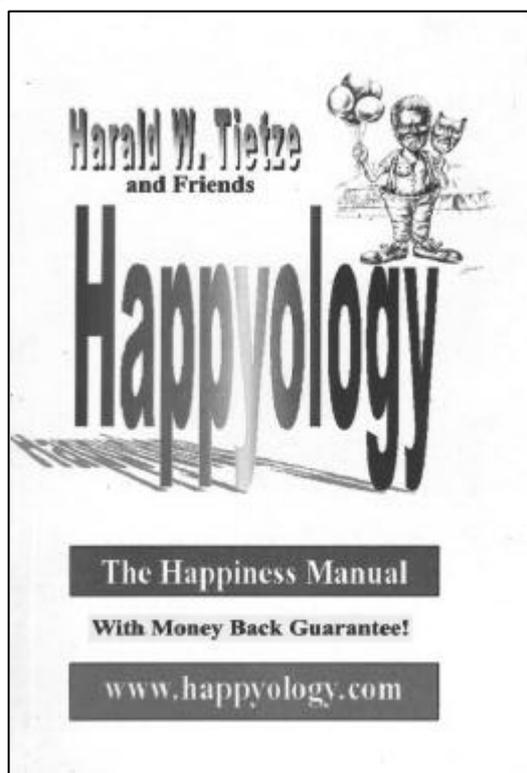
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## About the Author

Harald Tietze is a popular lecturer, researcher and writer on a wide range of natural health subjects. Harald's experience with herbal medicine dates back to his childhood in the 40's and 50's. Having grown up in a German city originally named "Herbolis", Harald learnt about herbs from his father who was also an accomplished herbalist.

Harald W. Tietze is author of over 30 health books. His work is translated into 19 languages. He has lectured in all continents, visiting 49 countries. The first book he wrote was on intuition and Earth Energies. Dowsing, Earth Energies and "Youthing" are still his favourite lectures.

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