Education News

ISSUE 8 | FROM THE NUTRIGOLD NUTRITIONAL UPDATE SERVICE

# SUPERGREENS – ORANGES AND GOLDEN YELLOWS

## THE IMPORTANCE OF DAILY ALKALISING

**We associate "alkalising the body" with being healthy, vibrant and clear. Supergreens such as sprouted grains and spirulina, alongside vibrantly coloured fruits and vegetables, can all help keep our pH in balance so we can perform better on every level. Alkalising diets are a key focus for many nutritional therapists, naturopaths and detox plans, but many of us are still unclear about what that means and why it is so necessary.**

In simple terms, we function best when the majority of our cells have a slightly alkaline environment (although some aspects of our body, such as the digestive tract and other mucous membranes, need to be slightly acidic, and the stomach more so). However, many of our day to day functions and experiences create acidity where we need to be alkaline. The result is an incredibly clever body that has systems in place to continually work towards bringing us back to alkaline again. As long as we have the energy, nutrients and space we need, our bodies can always bring us back into balance again.

An authentically traditional diet would provide the resources a healthy person would need to achieve this efficiently on a daily basis. Unfortunately, modern diets tend to lean more towards acidity than alkalising, as do modern lifestyles, and there is only so much our bodies can achieve. Pollution, alcohol, smoking and high stress lifestyles added to a poor diet can tip our bodies too far out of balance to recover effectively, especially when the nutrients required to help bring us back to alkaline are in short supply.

In such conditions, most of the basic chemistry that needs to happen within us will struggle; from digesting and metabolising foods to keeping our cells healthy and functioning. We become less able to do everything from keeping our bones strong to having enough energy to get out of bed in the morning. It is difficult to stress just how important the pH levels in our bodies are. In fact studies have shown how alkalising the diet can improve a range of conditions, from kidney stones[1] to rheumatoid arthritis[2] and chronic back pain[3].

## WHAT IS PH?

We measure how acidic or alkaline something is by the amount if hydrogen ions present, and we use the pH scale to describe this. The lower the number, the more acidic the reading (and the higher the number of hydrogen ions present). The pH level of vinegar is about 2, which means that it is very acidic: in fact 10 times more acidic (so 10 times the quantity of hydrogen ions) than orange juice, which has a pH of 3, and 100 times more acidic than tomato juice, which has a pH of 4. Anything with a pH of 7 is neutral, and above that is alkaline. So seawater has a gently alkalising pH of about 8, baking soda is 10 times more alkaline with a pH of 9, soapy water has a highly alkaline pH of 12, and bleach is very strongly alkaline with a pH of 13.

## WHAT SHOULD OUR PH BE?

Precise levels will vary from person to person, and from moment to moment, depending on what we are experiencing and how well our body is regulating our response. There are also some variations within the body depending on what is most useful for the local function. The stomach, for example, needs a very strong acidic environment to kill off harmful bacteria, help to break down foods and activate its protein enzymes. Mucous membranes, such as the digestive tract, uterus, lungs and sinuses, are usually slightly acidic. The pH of skin is about 5.5, which is very different from many of the soaps and detergents we expose it to. Most of the body prefers to be just slightly on the alkaline side of neutral, however. Blood, for example, has a slightly alkaline pH of between 7.34 and 7.43, and the body will prioritise keeping the blood to this pH as it is involved in so much vital activity.

We usually measure the pH of the urine and/or saliva to give us an indication of how balanced our pH is, and there are varying opinions on what constitutes a healthy pH there. Saliva is generally suggested to have an optimum pH of 6.4, but the ideal pH for urine is not so clear. Some argue the more alkaline the better; others caution that urine with a slightly acidic pH of 5.5-6.5 is a sign that the kidneys are effectively ridding the body of metabolic acids, and so an alkaline reading might suggest problems.

## BALANCE

The key word is balance. We need to ensure our body has all the resources it needs to maintain a healthy pH. This means that many of the foods we need will feature on the "acidic foods" lists.

The aim is not to banish acidic foods and just eat alkalising foods, but to ensure that we are eating an appropriate balance that gently keeps us where we need to be.

This may be a relief for those who are confused by the different acid/alkaline lists out there. There seems to be a fair amount of disagreement on which foods are alkalising and which foods are more acid-forming, depending on how levels are measured. Often tables are used that measure the pH of the ash of burnt food items, to simulate what happens to them during digestion.[4] Hermann Aihara in his seminal book "Acid and Alkaline"[5] also factors in calcium/phosphorous rations, sodium/potassium ratios, our ability to fully digest foods and other aspects. He points out that we need to be looking at the bigger picture of what effect each food has on the body, not just the pH of its ash.

Generally speaking, animal proteins will be most acidic; grains (such as wheat and rye) will be more on the acidic side, unless sprouted in which case they become more alkalising; and vegetables, especially raw vegetables, and seaweeds are largely alkalising. Most fruits produce an alkalising ash, but the excess of sugar they contain may produce acidic conditions in the body, especially when consuming large amounts.

Many of us have been brought up with high levels of meat, bread and pasta, with alkalising vegetable struggling to find space. Sweets, pastries and caffeine add more to the acid load, so tea and cake or regular puddings will be pushing us even more in that direction. But the answer is not to stop eating everything acidic, but rather to gently bring things back to centre by adding in more alkalising foods, and making wiser choices about which acid-forming foods are most useful to us.

## WHICH FOODS ARE GOOD TO AVOID?

Most sugars, especially refined sugars, will be highly acid forming. Even artificial sweeteners will be acid forming. Raw honey, molasses and maple syrup in moderation would be less acid forming choices due to their mineral content. Many processed foods, ready-made sauces and takeaways are also high in sugar. Alcohol and caffeine would also be on my avoid list. The rest would be a matter of personal balance.

# WHAT FOODS ARE GOOD TO ADD?

## PRE-SPROUTED BARLEY

Barley is a very gentle grain, and was probably the first grain to be farmed, its cultivation dating back some 9000 years in the Middle East, and its arrival in England about 6000 years. Ancient Egyptians, Greeks and Romans relied on it for sustenance – the Greek gladiators being known as "barley eaters" – and its most frequent use was for making bread and beer. Although the gluten content of barley is extremely low, the fermentation processes that are part of bread and beer making would have been an important step to make the grain easier to digest. Over the years, we have begun the process of adapting to the gluten in grains, but it is still advisable for many to ferment or sprout grains to ease their digestion. Sprouting grains also makes them more alkaline, and increases the availability of their nutrients. To sprout a grain, it is first soaked in water to mimic the spring rain, which deactivates the grain's enzyme inhibitors. These are substance in the grain that stop it from unfurling and growing in the wrong conditions. By deactivating the inhibitors, we are activating the grain to start budding and sprouting.

Pre-sprouted barley is barley that has been naturally activated to the point where its nutrients and enzymes are most available. This is the point when its full complement of nutrients is available in the grain bud, but it hasn't yet used up any of those nutrients to start to sprout. So there is a broad range of vitamins, minerals, amino acids and omega oils, plus a host of enzymes that we can utilise to aid digestion. The pre-sprouted barley is then dried at a temperature that won't destroy these life-giving enzymes, resulting in a true superfood with a highly energising potential.

French physicist André Bovis postulated a controversial and yet interesting way of measuring the bio-photon activity, or life force, of substances. Objects that measure less than 6,500 energy units on the Bovis Scale are said to be life-detracting, while above the 6,500 point, the higher the reading, the more vital or life-enhancing the substance. Humans are said to need to maintain levels of at least 8,000 to 10,000 units, and the Earth is said to create energy in the 7,000 to 18,000 range, which is the positive radiation necessary for the maintenance of life on this planet. Pre-sprouted barley has been reported to register an incredible 100,000 to 320,000 on the Bovis Scale.

## BETA-GLUCANS

More conventional science focuses on the beta-glucan content of barley, particularly in terms of its ability to lower blood serum levels of sugar, lipids and cholesterol. Beta-glucans are polysaccharides found in the soluble fibre portion of both barley and oats, and barley contains the highest levels at up to 11%. Yeast and mushrooms also contain a different type of beta-glucan, but it is the 1-3 and 1-4 beta-glucans found in barley that have been reported to have health benefits useful in preventing diabetes and heart disease.

### BETA -GLUCANS IN BARLEY LOWER CHOLESTEROL

A recent review of 11 studies concluded that a daily consumption of three grams of barley can significantly reduce both total and LDL cholesterol concentrations, without affecting "good" cholesterol levels.[6] Overall, barley and beta-glucan isolated from barley lowered total and low-density lipoprotein (LDL) cholesterol concentrations by 0.30 mmol/l and 0.27 mmol/l respectively, compared with the control.

### BETA-GLUCANS IN BARLEY BENEFICIAL FOR DIABETICS

A primary focus of nutrition for diabetics is on ways to stabilise blood sugar and blood lipid levels. A 2006 study tested the effects on healthy human beings of cereal products made with beta-glucan enriched barley flour, compared with similar products made with wholewheat flour. The beta-glucan rich products demonstrated favourable responses on glucose metabolism, and particularly on insulin levels.[7]

An article in Diabetes Care magazine also highlights the benefits of beta-glucans for diabetics. The article describes how beta-glucans, as soluble fibre, increase the viscosity of whatever foods are being ingested once they reach the small intestine. This viscosity, or gloopiness, slows down the absorption of nutrients, and so keeps the glycaemic index of foods lower – it's essentially acting as a slow-release mechanism. The researchers report that a 50% reduction in glycemic peak can be achieved with a concentration of 10% beta-glucan in a cereal food.[8]

## SUPEROXIDE DISMUTASE

Another exciting constituent in pre-sprouted barley is the enzyme superoxide dismutase (SOD), so called because it scavenges free radicals called superoxides and converts them into less potentially harmful compounds. There are various types of SOD enzymes bound to different minerals, such as manganese, copper and zinc. It's an enzyme that has attracted a lot of attention, particularly in research around cancer.

### SOD AND CANCER

Tumours have been shown to produce superoxide radicals, and yet levels of manganese SOD have been found to be low in all tumours, and levels of copper-zinc SOD have been found to be diminished in many of them.[9]

Manganese bound SOD works to prevent oxidative damage in the mitochondria, the cell's powerhouse. Mutations in this form of SOD has been associated with an increased risk of breast cancer. A Finnish study of over 900 women found that incidence of breast cancer was one and a half times higher in women who had mutations in this enzyme.[10]

A further study showed a 70% greater incidence of prostate cancer in men with the mutated manganese-SOD enzyme compared to those with no mutation in the gene. The researchers also noted a stronger association with high grade tumours.[11]

### SOD AND MOTOR NEURONE DISEASE

A mutation in our SOD1 enzymes has been linked to some forms of ALS, a type of motor neurone disease that can affect the brain cortex, brainstem and spinal cord.[12] SOD1 is a copper-zinc-binding superoxide dismutase enzyme that converts superoxides into oxygen and hydrogen peroxide. Further research has also shown how mutations in SOD1 have a direct adverse effect on synaptic function in the brain, and may also endanger brain neurons by a mechanism involving impairment of glucose and glutamate transporters.[13]

### SOD AND FERTILITY

Superoxide dismutase also acts as an antioxidant outside the cell, and this extracellular form, SODEX has been found in higher concentrations in the male testes than in any other organs. These high levels suggest a role in male fertility, perhaps in terms of protecting sperm from oxidative damage. Low copper-zinc-SOD levels have also been correlated with reduced fertility in both mice and fruit flies. Male fruit flies lacking copper-zinc-SOD become completely sterile, while females present with reduced fertility. Female mice with low levels of this enzyme we able to release eggs as usual and there were no changes to their cycle, but they experienced an increased rate of post-implantation embryonic loss, i.e. miscarriage.[14]

## CHLOROPHYLL

Pre-sprouted barley contains chlorophyll, the plant molecule that converts carbon dioxide into oxygen in the presence of sunlight. Its structure is very similar to that of our red blood cells, but with magnesium at its centre instead of iron. Chlorophyll has been studied in terms of its benefits for repairing a variety of wounds, including chronic ulcers.[15] Observing how chlorophyll seems to stimulate wound healing and also blood cell regeneration, some scientists have theorised that this may be due to the chlorophyll increasing the levels of oxygen in the blood.[16] It is a beautiful notion that chlorophyll may be capturing lifegiving sunshine and oxygen so that we too can breathe and shine. On a slightly less glamorous level, chlorophyll also seems to have anti-bacterial and also deodorant properties. In one study, 62 geriatric nursing home patients were given chlorophyllin tablets, a derivative of chlorophyll. It was reported to be helpful in controlling body and fecal odors, as well as aiding in easing chronic constipation and abating excessive flatulence.[17] Japanese studies noted chlorophyll's ability to rapidly eliminate the odour of garlic, alcohol and cigarettes consumed by volunteers.[18]

### CHLOROPHYLL AND CANCER

Chlorophyll is commonly used to help the body eliminate harmful heavy metals, and there is evidence that it may also help protect us from certain carcinogens. These cancer-causing substances include polycyclic aromatic hydrocarbons found in tobacco smoke[19], some heterocyclic amines found in cooked meat[20], and aflatoxin, a fungus found on some legumes, particularly peanuts and corn. Chlorophyll appears to bind with these substances before they are even absorbed in the gut, thus preventing them from entering the body.

# FLAX SEED

Alongside a great number of nutrients, flax seeds are rich in omega 3 oil, an essential fatty acid that is widely deficient in modern diets due to our excess of omega 6 intake. The ratios have tipped far too heavily in favour of omega 6, and so we need to be actively redressing that balance.

Omega 3 is a crucial component of every cell in our body, helping it to stay flexible and facilitating the flow of nutrients, waste materials and information in and out of the cell. This is of fundamental importance for every single activity the body performs, from gene expression to cardiovascular health. Due to its unsaturated structure, omega 3 oils have a high level of electron activity, which helps attract oxygen and light to the cell. In addition, they help to create anti-inflammatory prostaglandins, and a healthy brain and nervous system.

The benefits of flaxseeds are countless and cannot be done justice here, so I shall pick out just a few examples.

### FLAX SEED AND HEART DISEASE

A Canadian study gave young, healthy adults 50g flax seed daily for 4 weeks, and noticed a number of improvements, including an up to 8% reduction in LDL cholesterol, and a 30% increase in bowel movements.[21]

Flax seed also contains an abundance of soothing lignans, a group of polyphenols that lay claim to many health-giving properties. Recent studies have highlighted the main lignan in flaxseed, secoisolariciresinol diglycoside (SDG), and a number have looked at its ability to help prevent heart disease by strengthening and protecting blood vessels; others look at its efficacy in reducing blood cholesterol; some show how flax seed can reduce high blood pressure; further studies look more in depth at its antioxidant potential. All in all, flax seed appears to offer significant potential benefits in terms of heart disease prevention.

### FLAX SEED AND CANCER

Lignans are converted by beneficial gut flora into two hormone-like substances called enterolactone and enterodiol, which have interesting implications for a number of cancers, including breast cancer. One study gave postmenopausal women a daily muffin containing either 25 grams of soy protein, 25 grams of ground flaxseed, or a placebo muffin containing neither, for 16 weeks, and then looked at estrogen metabolism. They noticed alterations only in the group eating the flaxseed muffins. In this group they found significantly increased levels of 2-hydroxyestrone, a less biologically active estrogen metabolite thought to be protective against breast cancer.[22]

A prostate cancer study gave men with prostate tumours 30 grams of flaxseed daily for a month before their surgery. The study involved 161 men split into four groups: some took the flaxseed, some took flax seed and followed a low fat diet, some just followed the low-fat diet, and a control group of 40 did not alter or supplement their usual diet. The men who took flaxseed, as well as those who took flaxseed combined with a low-fat diet, did the best.

Researcher Wendy Demark-Wahnefried, believes the omega-3s in flaxseed alter how cancer cells clump together or cling to other cells, while flaxseed's anti-angiogenic lignans disrupt the tumour's blood supply, thus helping to prevent cell division and so cancer growth.[23]

### OMEGA 3 AND ARTHRITIS

A 1994 review discussed the merits of omega 3 oils to help reduce inflammation in rheumatoid arthritis and osteoarthritis. The researchers describe how omega 6 oils can increase formation of pro-inflammatory cytokines, while omega 3 oils can inhibit them.[24] A more recent review also considers the anti-inflammatory properties of omega 3 oils in treating rheumatoid arthritis,[25] and a 2006 meta-analysis of omega 3 in the treatment of joint pain concluded that these oils are "an attractive adjunctive treatment for joint pain associated with rheumatoid arthritis, inflammatory bowel disease, and dysmenorrhea."[26]

# QUINOA

Quinoa is an ancient South American grain, that is actually not a true grain, but a seed rich in all the essential amino acids, in particular lysine, which is needed for tissue growth and repair and often used for cold sores. It is also higher than most grains in the sulphur aminos cysteine and methionine, which have a number of important roles in the body, including detoxification and oil transport. Methionine can also be also converted with the help of vitamins B3, B6 and folic acid to SAMe, a methyl donor – and quinoa is impressively rich in each of these vitamins. Methylation sparks off fundamental processes involved in DNA integrity, correct cell replication, basic nerve cell health and function, detoxifying the liver, and much more.

Quinoa is an excellent source of manganese and copper, two of the minerals required for producing SOD, the superoxide transmutase enzymes discussed above. It is also a good source of magnesium, which is useful in the prevention of heart disease, osteoporosis, cramps, gallstones, period pains, anxiety and many other conditions.[27] In addition, quinoa contains the kind of lignans that are so beneficial in flax seed. Quinoa also has high levels of calcium, together with the magnesium we need to utilise it.

# BILBERRY

Bilberries are a European wild blueberry, vaccinium myrtillus. Its deep colour is due to a particular type of flavenoids present in the juice and skin called anthocyanins. These anthocyanins increase our blood serum antioxidant capacity the more berries we eat, and have been shown to be well absorbed when taken orally in powder form.[28] These antioxidants protect the stomach lining from forming ulcers by rapidly increasing its secretion of mucous[29], and also have a number of important benefits for heart health.

### BILBERRIES AND CAPILLARY STRENGTH

Anthocyanins have a particular protective effect on both blood vessels and the red blood cells that flow through them by keeping their cell membranes healthy and flexible. Red blood cells need to be malleable so they can squeeze through the narrowest capillaries.

Capillaries, our tiniest of blood vessels, are only 1 cell thick in places, and need to be able to stretch without breaking to allow the flow of substances in and out of the capillary, such as oxygen and carbon dioxide when we breathe, or healing fluids into tissue when it needs repair. Where there is a lack of integrity in the capillaries, thread veins and bruising can occur. An Italian study demonstrated bilberry extract's ability to significantly improve symptoms of varicose veins and poor circulation such as cramps, heaviness, numbness and swelling in the calf and ankle.[30] Two further trials reported a disappearance in most symptoms of varicose veins and haemorrhoids in pregnant women.[31]

In more serious cases, capillary fragility can lead to strokes, haemorrhages, heart attacks, macular degeneration and cataracts.

### CATARACTS AND MACULAR DEGENERATION

A Russian study gave a strain of rats prone to the key features of human age-related cataracts and macular degeneration a diet supplemented with bilberry extract. At 3 months none of them had any impairments in the lenses or retina, compared to the control group where more than 70% of the rats were already showing cataract and macular degeneration. [32]

### BILBERRIES HELP PREVENT HEART DISEASE

The anthocyanins in bilberries have demonstrated the ability to reduce the levels of atherosclerosis, characterised by calcium deposits on blood vessel walls.[33] Bilberry also thins the blood by inhibiting platelet aggregation, so can also help to prevent blood clots, and so strokes.[34]

## CARROTS

We all know that carrots help us to see in the dark – yes, that's not just an urban myth, the beta-carotene in carrots actually travels to the retina in our eyes, and is there transformed into rhodopsin, the purple pigment we need for night vision. In addition, like the anthocyanins in bilberries, beta-carotene's anti-oxidant action helps to protect eyes from cataracts, particularly in male smokers.[35]

### CARROTS AND CANCER PREVENTION

Beta carotene is a vitamin A precursor, and just one cup of carrots can contain enough of it to produce nearly 7 times the recommended daily amount of vitamin A in a non-toxic form. BUPA carried out an extensive survey of over 22,000 men over a 10 year period, and measured their beta-carotene levels to see if there was a correlation between cancer incidence and blood serum levels of this important antioxidant. It was noted that those men who had received a cancer diagnosis during this time had much lower levels of beta carotene in their blood than those who had not. The most common cancers recorded in this survey were lung, colorectal and skin.[36] A Boston study following over 100,000 men and women found that the best lung cancer protection was from a variety of caretenoids working together, which is why it is best to use whole carrot and not just the beta-caretenoids from carrots.[37] Alpha-carotene and lycopene were singled out in this study as being particularly useful, both of which are present in carrots.

Another substance found in carrots called falcarinol has also been linked to improved bowel health. Falcarinol is a naturally occurring pesticide in carrots, and has been shown to inhibit the development of colon tumours in laboratory trials.[38]

## TURMERIC

Ground turmeric root is a distinctive Asian spice used to flavour both savoury and sweet foods and to add a vibrant yellow colour. It is the turmeric in curries that can often stain table cloths and work surfaces, but that's not a reason to avoid it, as it has some remarkable healing properties, attributed to its turmerone oil and range of curcuminoids, including curcumin.

### TURMERIC MAY IMPROVE MEMORY

Recent research in Pakistan suggests that curcuminoids work together to improve memory, while curcumin on its own is not so effective.[39] So again we have an argument for using wholefoods and not just extracts to address or prevent certain conditions. Another Asian study correlated curry consumption with improved cognitive behaviour, speculating that turmeric may be the key, as Indian subjects had better results than their Malay and Chinese curry-eating counterparts, and Indian curries tend to contain much more turmeric.[40]

### TURMERIC AND INFLAMMATION

Turmeric is best known for being anti-inflammatory, and has shown to help alleviate symptoms of ulcerative colitis[41] and of irritable bowel syndrome (IBS)[42]. A recent study also found turmeric to be a safe treatment and just as effective as a non-steroidal anti-inflammatory drug for osteoarthritis of the knee.[43]

### TURMERIC AND CANCER

The curcumin in turmeric has been shown to be effective against a number of different cancers in a number of studies, including colon cancer, pancreatic cancer, promyelocytic leukaemia and breast cancer. Various pieces of research have demonstrated curcumin's ability to prevent cancer cells from proliferating, to cut off the blood supply to cancer cells (anti-angiogenesis)[44], to trigger natural cell death (apoptosis)[45] and to reduce adenocarcinomas in colon cancer.[46] In one study, curcumin suppressed tumour volume by more than 57% compared to the control group.[47] Curcumin has also been shown to arrest cell development in both hormone-dependent and hormone-independent breast cancers.[48]

## GINKGO BILOBA

The ginkgo biloba tree is the oldest tree on the planet, and has been growing in our soils for over 200 million years. Each tree can live up to 1000 years old, and a recent spate of research has uncovered a range of anti-aging properties that it seems we too can benefit from. Ginkgo has been shown to improve circulation, particularly to the brain but also to other tissue, and to enhance metabolic processes at cellular level. It also has antioxidant properties and a wide range of other benefits.

### GINKGO AND DEMENTIA

Results vary in trials looking at ginkgo's potential for preventing dementia, with some noting no benefit and others noting considerable improvements for those taking ginkgo biloba. Several trials have demonstrated improvement in cognitive ability in elderly subjects taking ginkgo, including one where 28% of Alzheimer's patients given ginkgo showed improvements in psychological tests, compared with 10% of the placebo group.[49]

Patients with cerebral dysfunction may also suffer from depression. A double blind placebo test of 40 such patients who had failed to respond to antidepressant medication gave impressive results. Those taking ginkgo showed a 50% reduction in symptoms of depression after 4 weeks, and a 68% reduction after 8 weeks.[50]

### GINKGO BILOBA AND HEART DISEASE

Ginkgo's ability to improve blood flow has been demonstrated in several studies. 79 atherosclerosis patients were given ginkgo biloba or a placebo for 6 months. Blood flow measurements showed a significant improvement in the ginkgo group, while those on the placebo had reduced blood flow.[51] Those in the ginkgo group also reported reduction in pain four times greater than those taking the placebo, and were able to walk longer distances by the end of the trial.

### TINNITUS AND VERTIGO

Ginkgo biloba has be shown to be effective for some in the treatment of tinnitus, a condition of ringing or other sounds in the ears suffered by millions around the world.

A three month placebo-controlled trial cleared the symptoms of vertigo in 47% or patients, all of who had been diagnosed with recent-onset idiopathic vertigo, compared to 18% in the placebo group.[52]

# KELP

Kelp is an alkalising brown seaweed growing in underwater forests off the shores of Britain and elsewhere. We mostly harvest bladderwrack for consumption in this country. Kombu and wakame are the form of kelp most popular in Japan, making up more than 10% of their diet, and is widely sold for use in stews, broths and other savoury dishes. Kelp is rich in a vast array of nutrients, including antioxidants such as vitamins C and E, manganese and zinc, flavenoids and carotenoids; and kelp is particularly noted for its iodine and fucoidan content.

### KELP AS AN OESTROGEN BALANCER

One study gave kelp to women with extremely irregular menstrual cycles. Not only were their cycles lengthened, but they also reported reduction in pain associated with endometriosis. The lengthening of the menstrual cycles is not only significant for general reproductive health. Longer menstrual cycles have also been shown to lower the risk of developing breast, ovarian and endometrial cancers. This is thought to be due to the lower levels of oestradiol hormone these parts of the body would have been exposed to. This particular form of oestrogen can stimulate the division of mutated cells in breast, endometrial and ovarian tissue, and increase the chance of further mutations in tissue cells. Oestradiol is released just before ovulation, so the fewer the periods, the less frequent the exposure. A test of human ovarian cell cultures demonstrated a 23-35% decrease in oestradiol levels after dosing with kelp extract.[53]

Reasearch has also suggested that the iodine in kelp may be a contributory factor. Iodine has been shown to have an oestrogen-modulating effect in human breast cancer cultures, and also to stimulate apoptosis, or natural cell death, in cancer cells.[54]

### FUCOIDANS IN KELP

Kelp contains compounds called fucoidans that are reported to have anti-cancer, anti-inflammatory, and anti-viral properties. They are sulphated polysaccharides, carbohydrate chains with sulphur attached. Various anti-inflammatory mechanisms of fucanoids have been studied, which make it potentially useful for a number of inflammatory conditions, from rheumatoid arthritis to cancer. Fucoidans have also been shown to block the binding sites for the herpes simplex 1 and 2 viruses. In addition they show anticoagulation properties, which could help in the prevention of blood clot formation, and so contribute to preventing strokes and thrombosis.

# SPIRULINA

Spirulina is the popular supergreen powder that turns everything temporarily bright green. It is a blue-green algae with an intense hue that indicates its incredibly high chlorophyll content. Chlorophyll is the alkalising plant molecule that uses sunlight to convert carbon dioxide to oxygen, and may help to increase our own oxygen levels. Spirulina is grown in lakes with extremely high, and therefore alkaline, pH levels.

Spirulina has been shown to lower blood pressure[55], lower cholesterol[56] and prevent skeletal muscle damage after exercise[57].

### SPIRULINA AND THE IMMUNE SYSTEM

Recent research took blood samples from 12 healthy volunteers and studied the effect of spirulina of the white blood cells which form part of our immune system, both when at rest and when stimulated to mount an allergic response. They found that spirulina seemed to increase the production of cytokines (interleukins 4 and 1beta, and interferon) which stimulate an inflammatory response that would protect cells against pathogens and parasites and infectious micro-organisms.[58]

### SPIRULINA AND ALLERGIES

Interestingly, other studies have shown spirulina to show an anti-inflammatory effect in conditions of chronic inflammation such as arthritis and allergic rhinitis. A recent double blind placebo-controlled study of 150 allergic rhinitis patients found that spirulina reduced the levels of interleukin 4, one of the cytokines that increased when aggravated in the immune system study. This reduction in interleukin-4 led to a lessening of symptoms.[59]

# HOW DO OUR BODIES KEEP US ALKALISED?

Our bodies have very intelligent ways of maintaining healthy pH levels. Firstly, we have bicarbonate, phosphate, and protein buffer systems which neutralise acids by combining them with alkaline minerals. This prevents strong acids from building up and causing damage in the blood and tissue cells. The kidneys also help to neutralise acids by combining them with bicarbonate and other alkalis before eliminating them via our urine. Breathing also helps us to alkalise, as we inhale alkalising oxygen and exhale acidic carbon dioxide. Finally, our skin eliminates acids through sweat.

# HOW CAN WE SUPPORT THIS?

We can support all of these functions by ensuring that our bodies have enough alkalising minerals and bicarbonate ions; plus the many minerals, vitamins and other nutrients needed to help make enzymes, hormones and prostaglandins to trigger off these processes; plus the nutrients required to make healthy kidney tissue, healthy lung tissue and healthy skin. Finally we need to make sure we have enough energy to carry out these processes, and that our bodies are not too overloaded dealing with the fallout of toxicity and stress to be able to alkalise effectively.

# SUPERGREEN SMOOTHIE RECIPES

**So now we know what to put in our smoothies, how do we make them taste nice? First of all, ensure you have a balanced blend of ingredients. Some supergreen powders just contain the more powerful detoxifiers, which make them very green, quite harsh tasting and sometimes a little overwhelming for the body to deal with. This may be appropriate for some people as part of a deeply cleansing programme. A formula containing a broad range of the ingredients suggested above will provide a gentler but very effective alkalising support, that will also be a lot easier on the taste buds. Either way, your supergreen formula will need a delicious base to make this a breakfast or snack to really look forward to. The smoothies below should keep you energised and smiling, whether you wake up to one or come home to one at the end of a tiring day. They are quick and simple to whizz up in a smoothie maker or even with a handheld blender, and will keep well in an airtight container if you want to take one with you on the go. Each smoothie recipe serves 2 people (or 1 very hungry person!), or makes 1 breakfast and a snack for later – or you can halve the quantities for a single smoothie. The juice recipe should be drunk straight away.**

## WAKE UP ZINGER:

50g (dry weight) almonds - soaked overnight in water
½ avocado
zest of 1 lemon
4tsp raw (unpasteurised) honey
4tbsp your favourite alkalising supergreen powder
1/3-1/2 litre water

**Blend ingredients in a smoothie maker or with a handheld blender, gradually adding the water until it's your favourite consistency.**

## TROPICAL TREAT:

50g (dry weight) brazil nuts – soaked overnight in water
2 dessertspoons dessicated coconut
2 bananas
2 tsp carob powder
3tsp raw (unpasteurised) honey
4tbsp your favourite alkalising supergreen powder
1/3-1/2 litre water

**Blend ingredients in a smoothie maker or with a handheld blender, gradually adding the water until it's your favourite consistency.**

## SUPER JUICE:

8 carrots
1-2 apples
1-2 sticks celery
1cm slice of root ginger
4tbsp your favourite alkalising supergreen powder

**Juice carrots, apples, celery and ginger, preferably in a masticating juicer, and then stir in the supergreen powder.**

For all of this we may need to both improve and supplement our diet in a number of ways, depending on our own individual nutritional profile. However the main focus will be to ensure our body has enough alkalising, mineral rich foods each day to keep us in balance. This is why many of us choose to add a supergreens powder to our daily diet, to help keep the balance right.

## WHAT HAPPENS IF WE DON'T MAINTAIN AN ALKALISING DIET?

If the body doesn't have the levels of alkalising minerals it needs to deal with the levels of acidity present in the body, then it will often draw calcium from the bones to make up the deficit. Osteoblasts, the cells that produce bone tissue, function less well in acidic conditions, while osteoclasts have been shown to release more calcium from the bones in acidic conditions. A 2001 study compared changes in calcium levels and bone density in a group of people given a high acid diet to a group given a more alkalising diet, and found a definite association. The group following a more acidic diet experienced greater loss of calcium and bone mass. The researchers noticed a significant change in serum levels of parathyroid hormone, which triggers calcium loss from the bones.

In addition, a heavier load will be put on the kidneys, lungs and skin to help eliminate excess acids from the body. These organs of elimination are often already under stress, helping the liver deal with increasing loads of toxicity, and perhaps also working hard to combat their own levels of toxicity. Even the lungs of non-smokers are regularly exposed to toxic chemicals as the air around us becomes increasingly polluted, and our skin is subject to the same air pollution, plus heavy metals and other harmful substances in our water, not to mention the irritants that find their way into even the most innocuous-seeming soaps, creams, lotions and deodorant sprays.

To begin with you may need to gradually increase the levels of alkalising foods, and gradually reduce the more acidic elements, until you find a balance that works for you. Most vegetables are alkalising, not just the green ones but also the yellow, orange, purple, red and white, and even more so in their raw state. Seaweeds such as kelp and wakame, blue-green algae such as spirulina, and green algae like chlorella are also highly alkalising. A moderate level of fruits is usually beneficial too.

A classic way to increase the vegetable content of our diets is with vegetable juicing. By juicing organic or biodynamic raw vegetables, we can absorb more of the goodness without having to digest huge bowlfuls of fibre (too much fibre can be at least as challenging for the digestion as too little). With a good juicer, this can be a useful and envigorating addition to the day. For those with less time, an inefficient juicer or not enough vegetables, a supergreen powder stirred into a smoothie or other cold drink can be an energising and alkalising boost. Stirred into a vegetable juice, they can be a powerful addition to a well supported cleansing programme.

Alkalising formulas usually contain a blend of powdered (often freeze dried) ingredients, such spirulina, vegetables, fruits and seeds. designed to help rebalance your pH and revitalise you. Such powders are not designed to take the place of a multivitamin and mineral supplement. Although they will all contain an impressive spectrum of minerals and vitamins, the quantities will usually be relatively low. The purpose of supergreen powders is not to provide recommended daily amounts of vitamins and minerals, but to help restore the body's pH balance, and so support every life-giving function we perform. They will, however, contain other nutrients, such as enzymes and flavenoids that have additional health benefits, including helping the body to detoxify and maintain healthy cellular activity. This will also help to keep our pH in balance.

A supergreen smoothie can be a fantastic way to start the day, or an easy snack to whip up mid-morning or take to work. A glass of supergreens can also be a refreshing welcome home at the end of a busy day. Below are some recipe ideas for ways to enjoy your supergreens, but in the meantime, here are some of the ingredients that your supergreen supplement, or smoothie may contain:

**Should you need a more detailed approach, or should you have any questions or concerns that are not addressed in this article, you are always welcome to contact our nutritional advice team on 01395 227850 (9.00am – 5.00pm Monday – Friday).**

Alternatively if you would like a more personalised approach, addressing dietary recommendations, lifestyle changes etc., we would suggest you consider consulting a qualified nutrition adviser or therapist, which you can do by either asking us for details of your local practitioners, or contacting The Federation of Nutritional Therapists on **0870 312 0042** or by emailing them at **admin@fntp.org.uk**

For more information visit the website at: **www.fntp.org.uk**

**Kirsten Chick is a qualified and practising Natural Nutritionist and member of the Federation of Nutritional Therapists. To find out more please visit www.connectwithnutrition.co.uk.**


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