

From the book ***Aloe Vera: Nature's Silent Healer*** by Alasdair Barcroft, Audin Myskja, Tom Reinolds

PROPERTIES OF **Stabilized ALOE VERA**

Through the ages aloe vera has been used for many different purposes – both internal and external. In many parts of Europe and the USA in the nineteenth century, one of the most popular uses of aloe vera (with the aloin fraction included) was as a laxative and purgative. Modern day processing methods have tended to focus on extracting this fraction so that only a minute percentage remains. The two most important of these anthraquinones, namely emodin and aloin, do have anti-microbial, anti-viral, anti-bacterial and painkilling properties. Since the 1930s, when modern day research began to unlock some of the secrets of aloe vera and its healing properties, a wide spectrum of therapeutic benefits have been identified. These include the following benefits – actions that have all been testified to and witnessed by medical practitioners, veterinarians, dentists, complementary therapists, nutritionists and laypeople throughout the world.

The key to aloe Vera's extraordinary properties and powers is, according to Dr. Bruce Hedendal of the Hedendal Chiropractic and Nutrition Center, in the USA the fact that the plant is a rich source of the long-chain sugars known as polysaccharide. In this opinion these polysaccharides are as vital to the body as brick are to a house. So what do these polysaccharides do? What functions do they perform in the body? Most agree that these polysaccharides must act synergistically with all the other nutritional constituents found in aloe vera in order to make such a positive health impact.

KEY TIP

Some of the latest thinking is that this essential component (i.e. the polysaccharides) of aloe vera may work by lubricating our joints and lining the colon, thus preventing the re-entry of toxic waste and providing a natural barrier against microbial invasion of the body's cells.

Acemannan and the anti-viral effect

Aloe vera is especially rich in one such polysaccharide, known as acemannan. This polysaccharide works, it is believed, by interacting with the immune system, boosting it rather than overriding it. It is a potent stimulator of macrophages (white blood cells that destroy bacteria, tumor cells, viruses and so on) to produce immune agents such as interferon and interleukin.

In 1990, at the Third International Conference on Antiviral Research in Brussels, it was reported that acemannan had been found to inhibit the growth of implanted sarcoma in mice. Also, when tested (i.e. injected acemannan) on cats suffering from feline leukemia, over prevailing statistics for this disease. Feline leukemia, like AIDS, is caused by a retro-virus and previously, seventy per cent of cats would normally die within six to eight weeks of being

diagnosed. As a result of this research, in 1991, the US Department of Agriculture (USDA) approved the use of acemannan in the treatment of fibro sarcoma in dogs and cats. Previously there had been no effective treatment for this cancer, but when exposed to acemannan the cancerous tissue is encapsulated and the tumor killed off, thus facilitating surgical removal.

KEY TIP

The unique mechanism of this key active ingredient (i.e. polysaccharides), coupled with its direct anti-viral activity, may explain why aloe vera shows such exciting potential in treating a wide range of both human and animal diseases and ailments.

Acemannan has been isolated and extracted from aloe vera by a company in the USA – www.carrisyn.com. The product, called Carrisyn is licensed for the treatment of feline leukemia and has apparently also been used in tests and trials in the treatment of HIV/ AIDS in humans. Acemannan has also been shown to demonstrate ‘significant antiviral activity against other viruses including the influenza virus and measles viruses. (Source: *Pharmacology of Natural Medicines*, Michael T Murray, ND, Joseph E Pizzorno Jr, ND).

Aloe vera, as we have said before, seems to have wide ranging healing and therapeutic properties and benefits, much of which it is believed is due to the synergistic way in which all its 200-plus identified nutritional constituents work together.

Adaptogen

Aloe vera is widely accepted as having adaptogenic properties and this is one of its most extraordinary qualities. Aloe vera seems to have the ability to act appropriately on the specific problem or problems of the individual using it, and this is one reason why people respond to it in so many different ways. You might, for instance, discover that while taking aloe vera (as a drink) for your arthritis, asthma or IBS, that your skin has improved or your gums have stopped bleeding or that you have more energy. Effectively this means that, for example, if someone was drinking aloe vera, the body would be able to benefit whether the person was suffering from one or more of the following conditions, e.g. IBS, arthritis, asthma and so on.

This means that aloe Vera can help with many different problems at the same time and that the body seems to be able to take from aloe vera that it needs, when it need it and where it needs it!

This ‘holistic healing and therapeutic effect’ seems to bemuse many conventional medical practitioners, whether doctors, dentists or vets. These are just some of the truly amazing properties of this apparently miraculous plant. One could also add that it helps maintain liver and kidney function and can even help correct hepatic dysfunction. It can also have a beneficial effect on people with diabetes, working to reduce blood sugar levels and to restore the natural release mechanism. I have also heard of people suffering from thyroid problems – both under-active and overactive – who say that their condition seems to be more stable than previously.

I am very pleased that since I started writing on aloe vera (1996-97) several highly positive and illuminating research studies or projects have been undertaken in the UK and the USA. I am confident that as the realization of the significance of aloe Vera’s wide ranging healing properties grows, coupled with the fact that there are no serious side effects, more research will be undertaken. I am greatly encouraged when I hear of more people benefiting

from using aloe vera, but the real test will come when the results of the research projects, currently taking benefits of aloe vera. It cannot be long now before the mainstream medical profession and everyone else will see the true scale of the potential of natural products like aloe vera in fighting disease, boosting the immune system and promoting and maintaining a greater sense of overall well-being.

You don't have to be ill to take aloe vera

Aloe vera can be taken orally simply as a health tonic or used topically on the skin to moisturize and condition the skin. It is not something that one uses only when one is unwell.

KEY TIP

Aloe vera can also contribute to an improvement in overall general health, as well as acting to help both prevent and manage many ailments, disorders and diseases.

Anti-ageing

Dr. Ivan Danhof is one of the world's leading authorities on aloe vera, its properties, uses and benefits. He is a former professor of physiology at the University of Texas and is president of North Texas Research Laboratories. Dr. Danhof has conducted many studies to discover the secret of aloe Vera's rejuvenating ability.

KEY TIP

He believes that one of the main reasons lies in the plant's unique ability to increase production of human fibroblast cells between six and eight times faster than normal cell production.

Fibroblast cells are found in the dermis of the skin and are responsible for the fabrication of collagen, the skin's support protein (that keeps skin firm, supple and 'youthful' looking.) During exposure to the sun and through the normal ageing process (and exposure to free radical damage), fibroblasts slow their collagen production and, as we grow older, the quality of collagen is reduced and the wrinkling in the skin becomes deeper as the skin loses its suppleness and flexibility.

Dr. Danhof found that aloe vera not only improved fibroblast cell structure but also accelerated the collagen production process. He also believes the clue to aloe Vera's 'unique' anti-ageing properties may lay, one again, with the 'magic' polysaccharides and their moisture-binding properties.

KEY TIP

Don't forget that many skin products that promise anti-ageing benefits do little more than temporarily dehydrate the skin. They do not have any positive effect on the stimulation of the production of natural collagen and any existing facial and other lines tend to remain as before.

Collagen production is not aloe Vera's only contribution to the body's anti-ageing battle. As people grow older, most tend to develop ageing spots on their hands, due to a complicated chemical process in the body, as well as to external factors like sunlight.

KEY TIP

Aloe vera however contains a potent blocker that can actually help reverse the ageing process by providing the skin with the necessary components to rejuvenate itself at cellular level. This can lead to softer, more pliable and younger looking skin.

Dr. Danhof himself tested the effects on his own hands by daily applications of aloe vera to one hand, leaving the other hand untreated. The difference was remarkable: the untreated hand had numerous ageing spots, while the treated hand had no blemishes whatsoever and resembled the hand of a much younger person!

Anti-inflammatory

Aloe vera acts as a powerful anti-inflammatory because of the presence of the naturally occurring sterols, anthraquinones and other naturally occurring substances, and the synergistic way in which all the constituents, including the polysaccharides, act together.

Aloe vera has been shown, in a number of studies, to exhibit a number of anti-inflammatory properties through its ability to 'block the generation of inflammatory mediators such as bradykinin and thromboxanes' (source: *Pharmacology of Natural Medicines*). It is thought that it is a combination of glycoproteins, some anthraquinones and salicylates that both inhibit and break down the bradykinin, which is one of the 'major mediators' of pain and inflammation. Aloe vera is widely used by people in the treatment and management of inflammatory conditions such as arthritis (both osteo- and rheumatoid) where it has a steroid-like action, without the side effect. It can also reduce the redness, pain and swelling associated with such conditions as muscular pain, sprains, strains, bruising and tendonitis.

As I mentioned in the introduction, I have both seen and experienced aloe Vera's effectiveness with sunburn and many writers report its wide ranging uses and benefits. In her book, *Herbal Medicine: the Natural Way to Get Well and Stay Well*, Dian Dincin Buchman advocates using aloe vera on burns, stings, insect bites, poison ivy blisters, acne and so on.

KEY TIP

In fact rashes of all kinds will generally be soothed by an application of aloe vera gel to the inflamed area.

Anti-microbial (anti-fungal and anti-bacterial)

Aloe vera has been shown to demonstrate significant activity against many common bacteria and fungi. As far back as 1949 (RY Gottschall), the anti-microbial properties of aloe vera were recognized. Gottschall found aloe vera to have anti-bacterial activity against mycobacterium tuberculosis. In a subsequent paper by Gottschall ('Antibacterial substances in seed plants active against tubercular bacilli', published in the *American Review of Tuberculosis*), he confirmed his original findings about aloe vera's properties.

In 1964, in the *Journal of Pharmaceutical Sciences*, Lorenzetti, Salisbury, Beal and Baldwin, in their paper “Bacteriostatic property of aloe vera” agreed with Gottschall’s findings and further concluded that aloe vera was a broad spectrum germ controlling agent and was also effective against e-coli, salmonella and streptococcus.

In 1982, Robson et al (source: Robson, MC, Heggens, JP, Hagstron, WJ, ‘Myth, magic witchcraft, or fact? Aloe vera revisited’, *Journal of burns Rehabilitation*, 1982:3:157-62) demonstrated the anti-microbial properties of an aloe vera extract with silver sulfadiazine (a powerful antiseptic used in the treatment of extensive burns). The anti-microbial effects of aloe vera compared favorably with the conventional treatment. The anti-microbial activity of the aloe vera extract in a cream base performed better than silver sulfadiazine in agar well diffusion studies.

In numerous studies, the following percentage content of aloe vera extracts was found to be bactericidal against common bacteria.

A sixty per cent aloe vera extract was bactericidal against *Pseudomonas aeruginos*, *Klebsiella pneumonia*, *Serratia marcescens*, *Enterobacter cloacae*, *Streptococcus pyogenes* and *Streptococcus agalactiae*. A seventy per cent aloe vera extract was bactericidal against *Staphylococcus aureus*, while an eighty per cent extract was bactericidal against *Escherichia coli* (E coli) and a ninety per cent extract was bactericidal against *Streptococcus faecalis* and *Candida albicans*. These anti-microbial properties have been further endorsed by Dr. Gregg Henderson, a chiropractic physician who is director of the Fallbrook Chiropractic Center in California and has been using aloe vera as an integral part of his treatment programs for over twenty years.

Anti-oxidant

Aloe vera is a potent anti-oxidant, helping the body scavenge dangerous free radicals (cancer forming agents) through the actions of its anti-oxidant constituents, including the so-called ACE vitamins, i.e. vitamins A, C and E and other naturally occurring nutrients. Free radicals are toxic and potentially carcinogenic compounds that are absorbed by all of us on a daily basis through pollution and food we eat, and are also created by our natural body processes. It is vital that we ingest sufficient amounts of anti-oxidants in our diets to counteract such damaging substances.

KEY TIP

We can absorb anti-oxidants through our skin as well as through our stomachs. So using aloe vera, both topically and internally can help in this process.

Cancer and the immune system

Dr. Danhof reports that aloe vera causes the release of tumor necrosis factor alpha, which blocks the blood supply to cancerous growths.

In Japan, at University of Okinawa’s department of epidemiology, it was reported in a study that daily doses of aloe vera could help PREVENT the onset of LUNG CANCER in smokers. As mentioned earlier, encouraging results have been obtained when treating cancer in animals with aloe vera and it has been widely reported that some cancer patients have experienced benefits from drinking aloe vera gel (a potent, proprietary, unflavored drinking

juice). It is important to note however that aloe vera should never be 'promoted' or 'marketed' as a cure for cancer, whatever the level of anecdotal evidence available.

In general, aloe vera seems to have a remarkable and sometimes almost unbelievable effect on the immune system: stimulating, supporting and modulating. More specifically, it has proved highly beneficial to AIDS sufferers, helping to restore the T and B lymphocyte balance. It is also known to protect the immune function of the skin against ultraviolet radiation. A study at the MD Anderson Clinic at the Medical Center in Houston, Texas, considered the effects of damaging ultra-violet exposure on the skin and it was found that when an aloe vera gel (topical gel) was applied to the skin before testing, the immune cells were fully protected.

Detoxifying agent

When taken internally as a drink, high quality aloe vera juice or drinking gel acts as a gentle cleanser and detoxifier. It does not – contrary to what one often reads in the columns of some newspapers – act as a purgative (providing the aloin concentration or parts per million of aloin is within the accepted levels, i.e. a maximum of fifty ppm).

In Japan, for example, which is one of the largest markets for aloe vera products in the world, including aloe vera drinks, there is a reported fifty ppm limit or standard. At the time of writing this book, I am not aware of any such standard in the UK, Europe or the USA. However, we are aware that the company that dominates global sales of aloe vera is also the largest supplier of aloe vera products to the Japanese market and as such conforms to Japanese standards.

Aloe vera works right through the digestive system and carries its healing properties throughout the epithelial tissue of the body. It has the ability to flush out dead skin cells and it helps to generate new cell growth and promotes healthier tissue, thus accelerating the healing of wounds, lesions and ulcers. It will also have this effect when applied externally to cut, burnt (including the damage caused by radiotherapy) or otherwise damaged skin tissue.

Digestive function

One of the curses of modern so-called developed world is that in many of these highly industrialized countries we have totally forgotten the basic need to eat good, natural and nutritious food. The vast majority of people in such countries eat food with a high degree of processing, containing many chemicals and few bio-available nutrients (and with the additional concerns of genetically modified foodstuffs) and the worst offenders, in terms of food types, tend to be packaged, heavily processed, convenience foods.

Is it really any wonder that so many people in these 'developed' countries suffer from digestive conditions such as IBS and other ailments and diseases that can be linked to immune deficiency problems, stress and diet? In the UK alone, it is estimated that one in five people (around 12,000,000 people!) suffer from IBS (statistics show that more than two thirds of all IBS sufferers are women) or some digestive tract problem like ulcers, colitis, ulcerative colitis, diverticulitis, Crohn's disease and so on during their lives. You will undoubtedly know someone with one of these problems.

KEY POINT

Apparently in the UK, IBS is one of the most common reasons for patients being referred to gastroenterologists by their GPs.

What is even more concerning is that, according to Dr. Peter Atherton (he was a GP for over twenty years) in his book "The Essential Aloe Vera",

Conventional treatment is not very effective and depends on dietary change, usually with an increase in fiber, anti-diarrhea or bulking agents, anti-spasmodic drugs, anti-depressants and psycho/hypnotherapy, etc.

According to Dr. Mark Hamilton (as reported in Good Housekeeping, February 2003 (UK version)), medical adviser to the Digestive Disorders Foundation and a consultant gastroenterologist at London's Royal Free Hospital, IBS is a positive diagnosis and not just a convenient get-out when doctors don't know what's wrong. He says, we use clear, internationally agreed criteria to diagnose IBS. It is a combination of abdominal pain, variations in bowel habit, bloating and distension, in the absence of anything else going on... IBS isn't curable, so treatment focuses on relieving your particular symptoms ... some people develop IBS after an infection such as salmonella and research shows that these people have abnormalities in the chemical transmitters in the gut. Something seems to have been altered by the infection.

KEY POINT

Dr. Ivan Danhof, who has acted as a consultant to many of the world's leading pharmaceutical research institutes and has advised organizations such as the US FDA, believes that ***aloe vera is beneficial to the whole gastro-intestinal system.***

He maintains that due to its magnesium lactate content, aloe vera is able to lower activity in the stomach and is effective in reversing both occasional and chronic symptoms in the upper gastro-intestinal tract.

In their book, Pharmacology in Natural Medicines, Michael T Murray, ND, and Joseph E Pizzorno Jr, ND refer to the study by Dr. Jeffrey Bland and relate the effect of aloe vera juice on the inhibition of gastric acid secretion. Apparently using Heidelberg gastric analysis, the aloe vera juice was shown to increase gastric pH by an average of 1.88 units. This would support the findings of other researchers that aloe vera gel, when taken orally as a drinking juice, can inhibit the secretion of hydrochloric acid. The test also suggested that the consumption of aloe vera juice could slow down gastric emptying with the possible benefit of improved digestion.

In his paper, 'Effect of orally consumed aloe vera juice on gastro-intestinal function in normal human beings', published in the US magazine "Prevention" in 1985, Dr. Jeffrey Bland, of the Linus Pauling Institute of Science and Medicine in California, concluded from the results of a clinical trial that aloe vera helps in the following:

- • it improves the digestion without causing diarrhea
- • it acts as a buffering agent to normalize the pH (rather like an alkalizing agent)
- • it reduces yeast content and promotes a more favorable balance of gastro-intestinal symbiotic bacteria

- • it can help specifically with disorders such as indigestion, IBS, colitis and stomach acidity

KEY POINT

Dr. Bland also found that aloe vera could improve bowel regularity and participants in the trial reported both an increase in energy levels and an overall sense of improved well-being (these are commonly reported benefits of people drinking high quality aloe vera gel).

KEY POINT

Other research would indicate that aloe vera penetrates the wall of the digestive system, flushing out harmful bacteria and helping to repopulate the system with beneficial flora.

KEY POINT

Aloe Vera also helps reduce inflammation, promotes the healing enhances the uptake of nutrients.

Healing agent

As far back as 1934-35, the first accepted medical study on the healing properties of aloe vera was conducted in the USA by C.E. Collins and his son. They wrote of the use of aloe vera to treat fifty patients suffering from radiation injuries. One particular patient who had developed severe Roentgen dermatitis as a result of having had a depilatory x-ray treatment (in 1932) was told she would have to have a skin graft because of the condition she had developed and the resultant damage. Yet within five months of being given regular topical applications of fresh aloe vera, the area was completely healed (further details of this and many other examples of research and trials are outlined in Chapter 8).

KEY POINT

We have already discussed aloe vera's ability to promote tissue regeneration. This property makes it a powerful healing agent for all types of wounds, both internal and external.

Dr. Danhof notes that it also accelerates the healing of broken or fractured bones by stimulating the uptake of both calcium and phosphorous (two minerals which are essential for healthy bone growth). Aloe vera is also known to help regenerate healthy skin tissue much more quickly than is the norm. Dr. Danhof also found that under laboratory conditions, the presence of aloe vera could effect up to an eight-fold increase in the replication of human fibroblast cells the cells that are closely linked with the production of new collagen in the body.

As a natural antiseptic, antibiotic and bactericide, aloe vera can also help clear up a wide range of infections, including those of a fungal nature. Professor Partick Peitroni in his "The Family Guide to Alternative Care" advocates its use for such conditions as athlete's foot, thrush and vulvitis.

Ross Trattler, author of *Better Health Through Natural Healing*, recommends the use of aloe vera to help treat hemorrhoids, warts and verrucae. Dian Buchman has also found that by applying aloe vera regularly to patches of hard skin on the elbows, hands and feet, the tissue softens and any cracked skin is healed.

Dr. Peter Atherton's paper, "Aloe vera: magic or medicine", which appeared in the July 1998 issue of the Nursing Standard, describes in detail the clinical trial he undertook to examine the benefits of how topically and orally administered aloe vera in patients with chronic venous leg ulcers may aid healing.

Heart conditions

Heart disease is reputed to be number one killer of both men and women in the UK (it may have a similar significance in the USA and many other developed countries). This one disease costs the UK and other countries billions of pounds every year in terms of medical treatment and the loss of highly trained and skilled people.

It is a disease that could be materially improved with fundamental changes to methods of prevention, which include diet or nutrition and exercise. Obviously many people may be predisposed, genetically; to heart disease but much more could be done to help reduce the incidence of this 'killer'.

KEY POINT

Again, Dr. Danhof has found that calcium isocitrate salts in aloe vera can help people with heart problems or with a history of heart disease in the family. He suggests a daily intake of high quality aloe vera drinking juices for those most at risk.

This finding has apparently been endorsed by other researchers. In 1985, at the annual meeting of the American College of Angelology, a paper presented by Dr. OP Agarwal summarized the results of a five-year study of 5,000 people diagnosed as having angina pectoris. After aloe vera and the husk of 'isabgol' were added to their diets, they showed a marked reduction in serum cholesterol and the frequency of angina attacks was also noticeably reduced. Five years later, all the patients were still alive and no adverse side effects had been reported. Interestingly, fifty per cent of those involved in the study also had diabetes and the results demonstrated that aloe vera could also help in the control of blood sugar levels in diabetics. Other studies have shown that daily doses of aloe vera can help lower blood cholesterol significantly and that blood pressure can also be lowered within weeks. What it is that causes this effect has not yet been identified, though some believe that it could be related to some ingredient in aloe vera that helps emulsify cholesterol, thus enabling the body to eliminate it. Further research would have to be conducted to determine the extent to which aloe Vera could be used universally to achieve such results.

Moisturizer and cohesive agent

Anyone who uses aloe vera on their skin (and by that I mean a high quality topical preparation where aloe vera and not water is the main ingredient) on a regular basis will see a gradual improvement in condition, quality and consistency.

KEY POINT

If aloe vera is used regularly, the skin will look better, feel better and will offer improved protection against damage caused by harmful rays.

Aloe vera is a uniquely effective moisturizer and healing agent for the skin (both human and animal!!!). It works in three main ways:

- • Firstly, through its ability to carry nutrients and moisture through the layers of the skin, thus facilitating penetration and absorption.
- • Secondly, through its polysaccharide, by creating a barrier that helps prevent moisture loss from the skin. Because of this and the fact that it also contains anti-histamine and has antibiotic properties, it is beneficial for people with dry, sensitive and damaged skin.
- • Thirdly, it enhances the production of fibroblasts that are involved in the natural collagen generation process) as detailed earlier in this chapter) and also helps protect the skin from damaging rays.

KEY POINT

All these properties contribute to its increasingly formidable reputation as a potent healing, moisturizing, protective and cohesive agent.

Bio-availability

In a recent randomized, double – blind crossover trial, supported and funded by the IASC and run by the department of chemistry at the University of Scranton, PA, USA, and approved by its Institutional Review Board in accordance with the Declaration of Helsinki ('Effect of aloe vera preparations on the human bio-availability of vitamins C and E', Joe A Vinson, Hassan Al Kharrat and Lori Andreolli, department of chemistry, University of Scranton, PA, USA, 2002), tests were conducted to determine the effect of two samples of commercially available aloe vera drinks (selected and certified by the IASC) on the bio-availability of vitamin C (500 milligram tablets) and vitamin E (420 milligram capsules). Previously there have been no literature references describing the effect of the consumption of aloe vera liquid preparations (one based on the inner leaf gel product, "AVG", and one on the whole leaf product, "AVL") on the absorption of water or fat-soluble vitamins.

The number of people taking vitamin supplements is increasing due to a greater awareness of the benefits. In the USA alone, it is currently estimated that between fifty-on and sixty-one percent of the population consumed supplements. The elderly population is greatly increasing as a percentage of the overall population in developed countries and this age group is especially vulnerable to vitamin deficiency due to age-related decreases in absorption, reduced food intake and increased drug use. Vitamin C (ascorbic acid) is a water soluble vitamin essential to good health and to prevent scurvy. It is one of the most common supplements because there is epidemiological evidence that vitamin C reduces the risk of cancer, diabetes, cataracts and Alzheimer's disease. Vitamin C has also been proven to greatly enhance the absorption of iron and improve poor iron status.

A recent report showed that helicobacter pylori infection significantly impairs the bio-availability of vitamin C and this bacterium infects half of the world's population and is especially common in peptic ulcer patients. Individuals with kidney problems are deficient in vitamin C and hemodialysis further decreases ascorbate levels. The US government has recently increased its guidelines for the consumption of vitamin C to seventy-five milligrams and ninety milligrams per day for women and men respectively, with a warning that smokers

need to add an additional thirty-five milligrams per day because their metabolic turnover of vitamin C is more rapid as is their rate of oxidative stress. In a comprehensive study of its pharmacokinetics in humans, it was suggested that the amount be increased to 200 milligrams per day, a figure that represents the maximum bio-availability. This amount can be obtained by eating a minimum five servings of fresh fruit and vegetables per day. Since the majority of people in the USA and other developed nations do not consume five servings, then it is recommended that either a supplement of Vitamin C or ingestion of an agent that can increase absorption of vitamin C may be needed.

Vitamin E, a lipid soluble vitamin, is needed in much smaller amounts than vitamin C. It is mainly found in oils that are often avoided by those with weight problems or those trying to diet. Vitamin E can reduce cognitive decline and improve the immune system in elderly people. Higher intakes of vitamin E were recently shown to be associated with a lower risk of Alzheimer's disease and prostate cancer. Age-related cataract and age-related macular degeneration are delayed by consumption of antioxidant nutrients such as vitamins C and E.

Epidemiological studies indicate that vitamin E may also reduce the risk of cardiovascular disease, though results from supplementation studies are mixed. Dietary fiber and low fat meals reduce the bio-availability of vitamin E as do to the long-term consumption of orlistat and olestra, a fat substitute.

The study was designed as a randomized, double blind crossover trial and on study days, at least one week apart, each volunteer, after an overnight fast, had a baseline blood sample taken. They then consumed in a random fashion 500 milligrams of vitamin C tablet or 420 milligrams of vitamin E capsule with either 60 milliliters (2 ounces) of either water (control) or one of the two aloe vera preparations (inner leaf gel or whole leaf), which was slowly sipped over five minutes. Further blood sampling was done after one, two, four, six, eight and twenty four hours (fasting) post-dosing. Subjects were allowed to eat their normal lunch and evening meals. One week and two weeks later, the other liquid was consumed with vitamin C or vitamin E and the sampling repeated. Blood was converted to plasma, mixed with metaphosphoric acid preservative only for vitamin C and stored at minus eighty degrees centigrade.

The results were significant and indicated that aloe vera preparations improve the absorption of both vitamin C and vitamin E by up to 369 per cent. The absorption is slower and the vitamins last longer in the plasma with the aloe vera preparations. Aloe vera is the only supplement known to increase the absorption of eight subjects consumed 500 milligrams of ascorbic acid alone (control) or with 60 milliliters of aloe vera juice (AVG, gel, or AVL, whole leaf extract).

The “what’s what” in STABILIZED ALOE VERA

AMINO ACIDS

Amino acids are the building blocks of protein and affect brain function, including emotions. Twenty amino acids are considered necessary for good health (in human beings) and the body is able to “manufacture” only twelve, all except the eight “essential” amino acids (essential because the body does not manufacture them itself), which we have to introduce through our food and drink intake. All of the eight essential amino acids can be found in aloe vera and they are:

- • Isoleucine
- • Leucine
- • Lysine
- • Methionine
- • Phenylalanine
- • Threonine
- • Valine
- • Tryptophan

The non-essential amino acids are:

- • Alanine
- • Arginine
- • Asparagine
- • Cysteine
- • Glutamic acid
- • Glycine
- • Histidine
- • Proline
- • Serine
- • Tyrosine
- • Glutamine
- • Aspartic acid

ISOLEUCINE

Research would suggest that an isoleucine supplement may help with symptoms of ME because it reduces levels of tryptophan (a precursor to sleep) in the brain. Isoleucine is found in such foods as cheese, oats, gelatine and sunflower seeds.

LEUCINE

Again this helps to inhibit the level of thryptophan in the brain and when taken in combination with isoleucine it can reduce chronic fatigue. It is found in the same food sources as isoleucine.

LYSINE

In studies it has been shown to help with the symptoms of the herpes virus. In trials, people taking a lysine supplement have seen a reduction in the frequency of outbreaks of cold sores and genital herpes. It is found in such foods as tofu, beans, lentils, broccoli and potatoes.

METHIONINE

In studies this has been found to help combat allergies, such as hay fever, as it reduces histamines. In order for it to be metabolized effectively, it should be taken in conjunction with B vitamins (i.e. B12 and folic acid). It is found in such foods as Brazil nuts, sesame seeds and oats.

PHENYLALANINE

It is used in the production of adrenal and thyroid hormones. Through its production of natural painkillers – known as endorphins – it has been found to help reduce persistent pains caused by backache and arthritis. It also seems to act as a natural anti-depressant. It is found in such food as gelatine, cheese, peanuts, almonds and oats.

THREONINE

A study found that low levels of threonine were found in patients with clinical depression, and of those supplemented with it the majority had reduced symptoms. It is found in such foods as peanuts, almonds, gelatine, cheese and fish.

VALINE

This has been shown to help reduce the symptoms of ME by inhibiting the levels of tryptophan in the brain. It is recommended to be taken in conjunction with isoleucine and leucine. It is found in such foods as gelatine, cheese, peanuts, oats, fish and sunflower seeds.

TRYPTOPHAN

This produces serotonin in the brain and is used in common with anti-depressants. Low levels of serotonin can cause insomnia, depression, food cravings and attention deficit disorder. A double-blind study on a group of twenty obese patients using 900 milligrams per day of tryptophan resulted in significant weight loss in all patients and a dramatic reduction in food cravings, especially for carbohydrates, over a twelve-week period. It is found in such foods as sunflower seeds, cheese, oats and Brazil nuts.

The non-essential amino acids are:

ALANINE

People on low-fat or high-protein diets or who do a lot of exercise need more alanine, as do diabetics, who need higher amount in order to produce enough glucose. Alanine is found in such foods as gelatine, red meat, fish, sunflower seed, almonds, peanuts and oats. There are no alanine foods supplements.

ARGININE

This is used mainly to make muscle tissues and sperm as well as relaxing blood vessels. Recent research has found that L-arginine helps in reducing angina, high blood pressure and glaucoma. Supplementation has also been found to help increase muscle mass for weight trainers. Arginine is found in such foods as gelatine, peanuts, almonds, Brazil nuts, red meat, fish, oats and grains.

ASPARAGINE

Closely related to aspartic acid, asparagine is required by the nervous system to maintain equilibrium. It is also required for amino acid transformation from one form to the other, which is achieved in the liver.

CYSTEINE

Research has shown that cysteine can be used when an overdose of paracetamol has been taken, because it helps to break down toxins in the liver. It is also helpful for cancer patients undergoing chemotherapy, as well as helping to remove excess heavy metals from the body. It is found in such foods as sunflower seed, oats, eggs, wheat flour and Brazil nuts.

GLUTAMIC ACID

Its main use is in the production of folic acid, which is necessary in healthy people, especially women. However, too much glutamic acid in the body can sometimes promote epilepsy and seizures. People need to make sure that they keep their vitamin B6 levels high in order to combat the high levels of glutamic acid, which is broken down by an enzyme supported by vitamin B6. Glutamic acid is found in such foods as cheese, sunflower seeds, almonds and wheat flour. There is no need for supplements because we get plenty from food, and levels may even need to be reduced if you are susceptible to epilepsy.

GLYCINE

People suffering from gout may be helped by glycine supplements because it helps to break down uric acid in the kidneys. Several scientific studies have found that supplementation can also reduce the symptoms of schizophrenia. Glycine is found in such foods as gelatine, buckwheat flour, walnuts, almonds and sunflower.

HISTADINE

Its main function is for making histamines that cause allergies and hay fever, so sufferers should make sure their intake is not too high. Research has shown that people with rheumatoid arthritis have very low levels of histadine and that supplementation reduces joint inflammation. Taken alongside standard anti-inflammatory painkillers, it also helps to reduce the main side effect of the painkillers, which is gastric inflammation. Histadine is found in such foods as gelatine, dairy products, peanuts and sunflower seeds.

PROLINE

This has been shown to slow down the progression of a condition called gyrate atrophy or lesions of the eye. It needs to be taken with vitamins B3 and C. It is also believed to speed up wound-healing. Proline is found in such foods as gelatine, cheese, wheat, oats and sunflower seeds.

SERINE

Research has found that supplementation with serine can improve memory function with regard to numbers, names and lists in the over-sixties by as much as twelve years, because it helps to release two crucial memory neuro-transmitters, acetylcholine and dopamine. It is found in such foods as eggs, walnuts, gelatine and almonds.

TYROSINE

This makes the neuro-transmitter dopamine, which is low in people with Parkinson's disease. Used alongside conventional treatments, there have been: better results than with drugs alone. It can also help to reduce stress levels because it increases the production of the hormone noradrenaline, which is depleted by stress. It is found in such foods as peanuts, cheese, almonds, sunflower seeds and eggs.

GLUTAMINE

Studies have shown that supplementation with L-glutamine can hasten the repair of stomach linings damaged by excessive alcohol consumption, as well as slowing down the body's craving for alcohol. L-glutamine is found in such foods as potatoes, barley and cabbage.

ASPARTIC ACID

Research has shown that aspartic acid is beneficial for cancer patients who have undergone radiotherapy because it helps red-blood-cells-producing organs to regenerate after radiation exposure. It can be found in such foods as walnuts, gelatine, almonds, sunflower seeds, meat and fish.

Much of the information in this section on amino acids has been sourced from the excellent book by Linda Lazarides called "The Amino Acid Report".

ANTHRAQUINONES

There are twelve anthraquinones found in the sap layer of aloe vera, which are:

- • Aloetic acid (antibiotic)
- • Aloe emodin (bactericidal)
- • Aloin (analgesic, anti-bacterial, anti-viral)
- • Anthracene (antibiotic, anti-inflammatory)
- • Anthranol (antibiotic)
- • Barbaloin (analgesic, antibiotic)
- • Chrysophanoic acid (fungicidal for the skin)
- • Emodin (bactericidal and skin problems)
- • Ester of cinnarnic acid (analgesic, anaesthetic)
- • Ethereal oil (analgesic)
- • Isobarbaloin (analgesic, antibiotic)
- • Resistanol (bactericidal)

Anthraquinones have traditionally been regarded as powerful laxatives and researchers have found that when used in relatively high concentrations on their own these substances can be toxic to cells. However, when present in the gel and in low concentrations of less than the widely accepted level of fifty ppm, the anthraquinone fraction can demonstrate highly beneficial and potent properties, which include: acting as a tonic for the digestive system by strengthening the digestive muscle: being effective natural analgesics (painkillers) and having powerful virucidal, anti-bacterial and anti-fungal properties. When the anthraquinones are present in properly stabilized, pure aloe vera drinks, these beneficial properties are demonstrably evident without the other less desirable side effects such as the laxative / purgative effect.

ENZYMES – THE KEYS TO LIFE

Enzymes are critical to both human and animal life and their function is quite simply to break down the proteins in the food we eat into amino acids. These are then absorbed by the body and converted back by the enzymes into body protein. Essentially, enzymes turn the food we eat into fuel for every cell in our body, so enabling those cells to function and our body to operate efficiently. However what is it that fuels the enzymes and allows this ongoing and complex chemical process to continue? The answer is vitamins and minerals, without which the whole process would come to a grinding halt. For example, the body cannot break down or utilize protein without zinc and vitamin B6, and vitamins B1, B2, B3 (niacin) are essential for the production of energy.

Just as aloe Vera's powerful healing properties seem to be attributable to the highly complex and synergistic action of all of its nutritional components, so the body is a complex mix of ongoing and continual chemical processes and nutrient interactions. A good example of this is in the movement of muscles. In order for this to take place effectively the body needs fuel – oxygen and carbohydrate plus an array of minerals and vitamins, including calcium, magnesium, phosphorous and iron, and vitamins B1, B2, B3 and B5. The vitamins A, C and E (the so-called ACE or Anti-Oxidant Vitamins), plus the minerals zinc and selenium, are potent antioxidant nutrients. Vitamins B3, B5 (pantothenic acid), B6 and B12, in combination with

choline, calcium, magnesium, zinc, manganese, chromium, selenium and the vitamins A, C and E, have a positive effect on brain function.

The main enzymes found in aloe vera are:

- • Amylase (one of the two main digestive enzymes, with protease, breaks down sugars and starches)
- • Bradykinase (stimulates immune system, analgesic, anti-inflammatory)
- • Catalase (prevents accumulation of water in the body)
- • Cellulase (aids digestion – cellulose)
- • Lipase (aids digestion – fats)
- • Oxidase
- • Alkaline phosphatase
- • Proteolytiase (hydrolyses proteins into their constituent elements_
- • Creatine phosphokinase (aids metabolism)
- • Carboxypertidase

Lignin

This is a cellulose substance that seems to give aloe vera its powerful penetrative properties and, so far, no other particular properties of benefits have been established.

Minerals

To date, many different minerals have been found in aloe vera, the most important being the following:

Calcium	Essential for the healthy formation of teeth and bones and in muscle contractions and heart function
Chromium	Helps to balance blood sugar through GTF – glucose tolerance factor – and helps in protein metabolism
Copper	Essential component of red blood cells, pigmentation of skin and hair
Iron	Essential component of hemoglobin in red blood cells, involved in the transportation of oxygen
Magnesium	Helps strengthen teeth and bones, helps maintain healthy muscles and nervous system, helps to activate enzymes
Potassium	Helps regulate and maintain fluid balance in the body
Phosphorous	Helps form and maintain fluid balance

	in the body
Sodium	Helps regulate body fluids, aids nerve and muscle function, aids in the transport of nutrients into body cells
Zinc	Present in most tissue and scores of enzymes, essential for good health, accelerates healing of wounds, essential for growth, aids healthy teeth and bone growth, is essential in the normal functioning of the skin, immune, digestive and reproductive system

Mono- and polysaccharides

Aloe vera contains simple sugars that include glucose, fructose and mannose and are known as monosaccharides and more complex, long-chain sugars, known as polysaccharides. The monosaccharides are simple structures that are readily broken down by enzyme action and then absorbed by the body.

The more complex, long-chain sugars, where glucose and mannose are linked, are known as polysaccharides or gluco-mannans. It is these unique long-chain sugars that researchers such as Dr. Ivan Danhof in USA (see references to him later in this chapter) and medical practitioners, such as Dr. Gregg Henderson (he has been using aloe vera for over twenty years), Dr. Peter Atherton, a UK doctor, and David Urch, a UK veterinarian (the latter two have both been using aloe vera for over seven years) and many others in the USA, the UK, Europe and other parts of the world, believe are the key to aloe Vera's unique healing and immuno-stimulating properties.

KEY TIP

These complex structures (i.e. polysaccharides) have the ability to retain their structure and are thus not broken down but absorbed whole by cells in different parts of the body, e.g. the digestive tract. This process is known as pinocytosis and means that the polysaccharides, with all their healing and immuno-stimulating properties and actions enter the bloodstream intact.

One polysaccharide in particular – acemannan – has now been shown to have significant health-giving properties. It:

- Restores and boosts the immune system
- Is anti-viral
- Stimulates the production of macrophages (large white blood cells)
- Increases the capacity of T-lymphocytes by up to fifty per cent

The ongoing confusion that seems to exist about polysaccharides and the so-called and often quoted term – “mucopolysaccharides” – is needed to be addressed. It is important to note that aloe vera does not contain mucopolysaccharides. The situation may have arisen through confusion between the terms mucinous polysaccharides (which are characteristic of aloe vera)

and mucopolysaccharides (nitrogen containing polysaccharides found in animals and bacteria), which has been misused in the promotion of some aloe vera products. All scientists working with aloe vera would agree that plant does not contain mucopolysaccharides. Given the scientific agreement that aloe vera does not contain mucopolysaccharides and the fact that the methanol precipitable solids (MPS; test does not measure polysaccharides, it would be prudent to look very carefully at those products that are promoted using the respective “mucopolysaccharide” content, especially based on the MPS test.

See the paper by Ronald P Pelley, PhD, MD, Department of Pharmacology and Toxicology, the University of Texas Medical Branch, entitled “The story of aloe polysaccharides”, produced by the IASC.

Salicylic Acid

Aloe vera also contains salicylic acid. This substance is similar in its properties to aspirin in that it helps to reduce fever and inflammation by lowering the body’s temperature. This is what helps give aloe vera its antipyretic properties.

It is thought that thousands of years ago the Greek physician Hippocrates discovered that a concoction using the bark and leaves of the willow could help to relieve the aches and pains of childbirth and lower fevers. What he didn’t know was that this portion contained salicin, part of the salicylate family of drugs that includes the common aspirin – acetylsalicylic acid. Modern researchers believe that because of its anti-inflammatory and anti-clotting properties, aspirin may help with a broad range of medical problems including:

- • Fever and pain
- • Heart attacks
- • Stroke
- • Cancer
- • Pre-eclampsia in high-risk women
- • Dementia
- • Alzheimer’s diabetes (those diabetics with cardiac or vascular complications)

Saponins

These are natural soapy substances that have both cleansing and antiseptic properties.

Sterols

These are naturally occurring plant steroids with analgesic, anti-inflammatory and antiseptic properties. The main sterols in aloe vera are:

- • Beta sitosterol
- • Lupeol
- • Campesterol

Vitamins

Aloe vera contains many vitamins and the main ones are:

Vitamin A	Beta carotene and retinol	Essential for healthy skin and tissue, bones, sight, anti-oxidant, boosts immune system, one of the so-called ACE or anti-oxidant vitamins that helps combat free radicals.
Vitamin B1	Thiamine	Essential for tissue growth, energy, brain function
Vitamin B2	Riboflavin	Essential for energy production, healthy skin and tissue
Vitamin B3	Macm	Essential for energy production, brain function, helps regulate the metabolism
Vitamin B6	Pyridoxine	Essential for brain function, hormone balance (PMS, menopause), metabolism
Vitamin B12	Cyanocobalamin	Essential in the utilization of proteins, energy production. B12 is mainly found in meat and dairy products and rarely in plants do (vegans/vegetarians please note). Lack of B12 can lead to anemia.
Vitamin C	Ascorbic acid	Essential to the immune system, helps in the production of collagen, helps to maintain healthy skin, joints, tissue and bones, and helps fight infections, cancer and heart disease, one of the so-called ACE or anti-oxidant vitamins, essential to combat free radical damage. Vitamin C is the most important of the immune boosting nutrients and helps in the production of T-cells that in turn help destroy cancer cells
Vitamin E	Tocopherol	Essential for healthy skin and tissue, aids fertility, promotes tissue healing, one of the three so-called ACE or anti-oxidant vitamins, essential to combat

		tree radical damage
Folic Acid		Essential for healthy nerve and brain function and in the production of red blood cells, critical in pregnancy to reduce the risk of birth defects such as hare lip and spina bifida.

Anti-oxidants and free radicals

The subject of anti-oxidants and their vital role in combating oxidants or free radicals will be covered in more details in Chapter 6.

Healing properties

When one first hears, reads or is told about the almost ‘miraculous’ and diverse properties of aloe vera, it seems almost unbelievable. In the past aloe vera (or parts of it) have been used as a laxative and now people take it because of its wide ranging benefits, including immune boosting, antimicrobial and wound-healing properties. These very diverse ‘benefits’ also help to explain its wide range of both general and clinical applications. Initially, it is easy to be highly skeptical and disbelieving simply because it is hard to accept that aloe vera can be so beneficial. Unless you have used aloe vera, it is difficult to understand how one plant can have so many healing properties and benefits. Generally, in the past, your doctor’s response to aloe vera may have tended to verge on the scathing and dismissive. It is only once you try aloe vera for yourself (either internally or topically) that you can really begin to experience the real potency and power of this plant – which is truly one of nature’s many gifts.

KEY TIP

Most of the doctors and practitioners who now write about and promote the healing benefits of aloe vera came to know about this amazing plant through personal first-hand experience

Many people, including most doctors, vets and dentists, often ask how a single plant can have such a wide range of benefits. How can aloe vera be:

- • One of the most efficient detoxifying agents
- • A powerful immune system stimulant
- • A strong anti-inflammatory agent
- • An analgesic
- • A stimulator of cell growth
- • An aid to the acceleration of tissue healing
- • An antiseptic
- • A rich source of nutrients
- • A powerful aid to the digestive system
- • And be adaptogenic?
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