More Energy and Less Disease with Vitamin C and MSM

Vitamin C, especially as sodium ascorbate, combined with MSM and transdermal DMSO, is a key supplement to take to increase metabolic oxygen supply, clean blood vessels, strengthen connective tissue, and even restore hair colour.

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Health authorities generally set low limits for the recommended daily intake of vitamins and minerals—high enough that obvious deficiencies in most individuals are avoided, but not high enough that these nutrients become a threat to the pharmaceutical industry by preventing and curing diseases. In this article, I show what can be done with higher amounts of vitamin C, as pioneered by doctors Linus Pauling, Ewan Cameron, Abram Hoffer and others. The results are even better when MSM (methylsulphonylmethane or dimethylsulphone) and vitamin B_3 are used in addition to vitamin C, while DMSO (dimethylsulphoxide) is most beneficial when applied to the skin.

There are hundreds of vitamin C studies with positive results published in the peer-reviewed *Journal of Orthomolecular Medicine* which specialises in vitamin research (see www.orthomed.org). In an act of obvious bias, the MEDLINE database lists all articles in medical research journals, even articles published in *Time* magazine and *Reader's Digest*, but not in the *Journal of Orthomolecular Medicine*. Because all these highly positive studies are not indexed by MEDLINE, proponents of drug medicine can claim that there are no studies showing that vitamin C is useful and safe in the treatment of diseases.

Thirty years ago, Linus Pauling and Ewan Cameron showed that high doses of vitamin C are beneficial in cancer treatment. This has been "disproved" by the orthodoxy ever since. However, a study by conventional Johns Hopkins scientists has shown that they were right after all.[1] There are, of course, countless studies and reports on the value of vitamin C in preventing and treating infections, but only if enough of the vitamin is being used.

In critical conditions, alternative medical practitioners like to give weekly infusions of 30 to 120 grams of sodium ascorbate (a mineral salt of ascorbic acid, or vitamin C). These can definitely be helpful. However, I now believe that it is more effective for most conditions to increase gradually the orally taken amount of sodium ascorbate to close to bowel-tolerance level. When diarrhoea or "loose bowels" start to develop, then just cut back by 10 to 20 per cent to a more comfortable level. In the following pages, I focus mainly on lesser-known aspects of using high doses of vitamin C, MSM and DMSO.

Supplements to Reduce Fatigue

There are many anecdotal reports about people feeling more energetic by supplementing with vitamin C, MSM, DMSO and niacinamide (vitamin B_3), either individually or together. I can confirm these from my own experience.

The following are just a few examples from the Internet.[2] Dr Stanley Jacob presented three case histories where five, 10 and 30 grams per day of MSM reduced or eliminated fatigue and pain in fibromyalgia and chronic fatigue conditions. A competitive athlete reportedly mixed equal amounts of MSM and vitamin C powder and drank it in the morning. It gave him an extreme

rush of energy, considerably more than either one did alone. Dr Abram Hoffer helped thousands of patients with cancer and schizophrenia with high doses of vitamins C and B_3.

Here is a paraphrased story. "I spread a liberal amount of DMSO on my abdomen. A few hours later, I played tennis and I felt a very large increase in energy and agility. I have repeated this a number of times since, with the same result."

Here is another paraphrased example, this time about Alzheimer's disease/senile confusion: "I gave mom some liquid DMSO in juice and within an hour she was a new woman! She could have a conversation, laugh, be alert. When the DMSO wore off, she was back to the fatigued, yawning and disoriented person. So I gave her some more DMSO, a teaspoonful, and within an hour she came alive again, holding a conversation and having energy."

In addition, niacinamide has been shown to improve memory and energy in Alzheimer's disease.[3] This is no real surprise because it also works in many other conditions, such as improving or normalising schizophrenia, senile conditions, arthritis, hyperactivity or behavioural and learning difficulties of children, dermatitis, juvenile diabetes, fatigue and lack of energy. It can also help in controlling cancer.[4] The reason why a single vitamin can help with all of these problems is because of its key role as a coenzyme in oxidative cellular energy production.

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Some other important nutrients for the oxidative metabolism are copper and vitamins B_2 and B_6.

In the following section, I explain how we can understand this energy boost as being a result of increased oxygen supply to anaerobic cells.

Our Alternative Oxygen Supply System

Our main oxygen distribution system is via the haemoglobin in red blood cells. A problem with it is that oxygen is released into the tissues only in response to the presence of carbon dioxide as generated with the aerobic energy metabolism through muscle or brain activity.

People with a high amount of *Candida*, fungi and other myco-microbes have an anaerobic metabolism in parts of the brain and in many muscles and organs. Also, cancer cells have an anaerobic metabolism and can become normal with increased oxygen supply so that tumours may just melt away.[5] Anaerobic cells do not produce carbon dioxide and therefore do not get sufficient oxygen from the normal blood circulation. This makes it understandable why it is highly beneficial with all anaerobic and low-energy conditions to use additional oxygen supply methods that do not require carbon dioxide to release oxygen.

Best suited for supplementation are vitamin C and MSM. These form reduction–oxidation or redox pairs. One such pair is vitamin C (ascorbic acid or ascorbate) as the reduced form, and dehydroascorbic acid (DHA) as the oxidised form. Another one is DMSO as the reduced form, and MSM as the oxidised one.[6]

The principle of action is as follows. In an oxygen-deficient environment such as a cell with anaerobic metabolism, a redox pair changes from its oxidised state to its reduced form by giving off one atom of highly reactive oxygen. When vitamin C or DMSO returns to the circulation and flows with the blood through the lungs, again it is being converted to its oxidised form. In this way, the redox cycle can repeat several times until the chemicals are gradually excreted through the kidneys and an oxidative energy metabolism can be restored in anaerobic tissue, where this is not possible with the oxygen in red blood cells.

DHA is the form in which vitamin C gets into the brain and most other cells. Vitamin C cannot enter directly in its reduced form; it only gets inside cells as DHA. Inside the cell, it is then reduced by liberating oxygen. With the normal intake levels of vitamin C and MSM from food, the released amount of oxygen is so low that it does not make a difference, and especially not in cells that produce carbon dioxide and get their oxygen from haemoglobin. But it can make a world of difference in anaerobic tissue, and with *high intakes* of vitamin C and MSM. The oxygen released in this way is initially highly reactive and kills the microbes inside the cells that caused this blockage, and then restarts the blocked oxidative energy metabolism. This is how vitamin C protects us against cancer and infections if we use enough of it.

I do not regard hydrogen peroxide and ozone as suitable oxygen delivery systems to restore the cellular oxygen metabolism. While hydrogen peroxide can be very beneficial to destroy or control fungal-type microbes in the stomach and small intestines, it is not normally suitable for delivering oxygen to anaerobic tissues deeper within the body as it is too reactive, and in the high amounts needed it would cause too much damage to antioxidant systems.

It has been used with good results, just like ozone, to destroy blood-borne microbes via intravenous infusions. But even blood can probably be cleaned just as well or better with frequent oral doses of sodium ascorbate and MSM than with the occasional intravenous course of hydrogen peroxide or ozone.

I regard this alternative oxygen supply as being very effective in all conditions of low energy, mental and emotional conditions, cancer, autoimmune diseases, liver diseases, fibromyalgia, chronic fatigue, and all other fungal or *Candida*-related diseases as well as chronic inflammations and infections.

Cleaning the Blood Vessels

Blood vessel congestion is the main underlying cause of many serious diseases such as cardiovascular disease (CVD) leading to heart attacks and strokes, and peripheral vascular disease (PVD) leading to varicose veins, deep vein thrombosis, leg ulcers potentially requiring leg amputation in diabetes cases, and poor blood supply to the brain. Many common conditions such as arthritis, degenerative eye changes (e.g., cataracts, macular degeneration), migraines and multiple sclerosis are aggravated by it. I've noticed symptoms attributed to multiple sclerosis or nerve degeneration disappearing with improved blood circulation.

The position of the medical orthodoxy is that atherosclerosis, the clogging up of blood vessels with cholesterol, is caused by high levels of low-density lipoproteins (LDL) transporting mainly cholesterol from the liver to other parts of the body. The main problem with this theory is that many individuals with persistently high LDL levels never have heart attacks, and many individuals with low or normal LDL levels *do* have heart attacks.

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In 1991 and 1992, Dr Matthias Rath and Dr Linus Pauling wrote important articles linking the development of CVD and PVD to vitamin C deficiency and their cure to vitamin C supplementation.[7,8] They showed that it is actually a variant of LDL, lipoprotein(a) or Lp(a), and not LDL, that is accumulating in the blood vessel wall and causing atherosclerosis. Lp(a) is formed in increasing amounts in the liver in response to low ascorbate concentrations. Animals, except for primates and guinea pigs, produce their own vitamin C at a daily rate which, adjusted for weight, is comparable to several grams that humans would need to get from food. It therefore comes as no surprise that CVD is essentially unknown in animals and Lp(a) is mainly found in species that have lost the ability to produce their own ascorbate.

Ascorbate deficiency results in degenerative changes of the blood vessel wall, potentially leading to life-threatening bleeding disorders.

To avoid such unwanted consequences, low ascorbate levels at the same time increase the plasma concentration of factors including Lp(a) and fibrinogen which constrict blood vessels and increase blood clotting. Accordingly, Lp(a) is deliberately accumulated in blood vessels damaged by vitamin C deficiency to strengthen the wall and prevent it from bleeding or bursting. An unwanted side effect of this defensive action is the clogging up of blood vessels like old water pipes and the formation of blood clots, especially micro-clots blocking the blood flow in capillaries. With this, vitamin C deficiency appears to be the main cause of acquired as well as inherited bleeding and blood-clotting disorders.

Another side effect of vitamin C deficiency is high or low blood pressure. Hypertension is mainly associated with CVD and is caused when the congestion of arteries and the blood-vessel-constricting effects dominate. Hypotension is mainly due to weakness and loss of elasticity in the veins, leading to PVD.

In PVD, triglyceride-rich lipoproteins accumulate in the plasma as very-low-density lipoproteins (VLDL). These are easily oxidised by chlorinated water, smoking, polluted air and other factors that deplete vitamin C, and then form brownish-coloured residues in affected tissues. Elevated glucose levels, as in diabetes, inhibit the cellular uptake of vitamin C, leading to greater degeneration of the blood circulation.

Rath and Pauling (and others) showed that prolonged high supplementation with ascorbate not only protects against the development of CVD and PVD but also gradually clears congested blood vessels and strengthens blood vessel walls. They wrote: "The therapeutic significance of our discovery is not limited to CVD; Lp(a) and ascorbate are involved in cancer, inflammatory diseases, and other diseases, including the process of aging." They also noted: "We are convinced that before long ascorbate will become the treatment of first choice for cardiovascular disease."[7] Not unexpectedly, this last statement is the only one in this article which has turned out to be totally wrong. Why would drug companies give up the highly profitable statins and face bankruptcy with vitamin C instead? Even if individual doctors are inclined to use vitamin C, the drug companies control the system. As I point out below, the drug companies are moving in the opposite direction by restricting the availability of vitamin C.

I can confirm from my own experience that this method works. However, in individuals with impaired liver function, the cholesterol and oxidised fats cleaned out from the blood vessels may not be removed through the liver but may remain under the skin for several months until they are gradually eliminated through the skin. This can temporarily lead to unclean skin.

Haemochromatosis and Iron Recycling

Individuals with iron overload problems, mainly the elderly and those with haemochromatosis (HC), may be reluctant to use vitamin C because of medical advice that it may increase iron absorption. However, from a biochemical perspective, iron overload is a problem of the redox balance, with too much iron in the oxidised ferro-form accumulating in the liver. I have shown that this can easily be cured or rectified with a sufficiently high intake of vitamin C (10 grams of sodium ascorbate spaced throughout day) to normalise the overall redox potential of the body.[9,10]

I had several HC patients whose iron levels normalised within weeks with a high sodium ascorbate intake. The success rate was 100 per cent, while with the low vitamin C intake suggested by conventional medicine it is zero per cent.

My first patient with hereditary HC was treated conventionally for several years with frequent blood-letting, and was close to death without his iron values being brought into the normal range—but these normalised within 20 days after starting ascorbate supplementation. His anaemia and very low haemoglobin values also normalised rapidly with the start of ascorbate therapy.

In medicine, HC is regarded as an iron *overload* disease because a high amount of oxidised iron in the form of ferritin, an iron-3 (Fe^{3+}) binding protein complex, is stored in the liver and also causes oxidative problems in other parts of the body. I prefer instead to regard HC as an iron *deficiency* disease. The body is deficient in *usable* iron, which is why it sends out a message to absorb more of it.

Vitamin C not only improves the absorption of iron, it is also required to move iron in and out of ferritin tissue stores. Without adequate antioxidants, ferric iron stores may build up because iron cannot be liberated from tissue ferritin and transferred onto plasma transferrin, the main protein in the blood that binds to iron and transports it throughout the body.

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This step requires vitamin C for a temporary reduction of 3-valence ferric to 2-valence ferrous iron.

A main problem is the recycling of iron from the continual breakdown of haemoglobin in the spleen. About 25 milligrams of iron are recycled daily in this way, but this requires a reduction–oxidation step to transfer ferritin iron in the tissue onto plasma transferrin. With vitamin C deficiency, there would be only a partial recycling.

Most of the iron stores build up in the liver where the decomposed haemoglobin arrives through the portal vein after its liberation from old erythrocytes in the spleen. This causes a very high oxidation potential in the liver, leading to various liver diseases and elevated liver enzymes. However, very high ferric iron stores in the liver would also make this organ more antioxidant deficient than other tissue. The highest vitamin C activity would be in the intestinal mucosa, as these have first call on the antioxidants absorbed from food. Therefore, transferrin will preferentially pick up iron from the intestinal mucosa and avoid the liver stores as too difficult to convert.

Iron overload is not just a problem of our genes. It is a general problem as we get older, but it happens more rapidly in men and with liver diseases. Therefore, it is probably a condition of most elderly individuals.

This causes generalised vitamin C deficiency being expressed as a great variety of old-age symptoms. Two very common ones are connective tissue weakness and loss of hair colour.

Improving Connective Tissue

Connective tissue holds the different parts of our body together. Examples of connective tissue are tendons, ligaments, skin, cornea, cartilage, bone and blood vessels. The main component of connective tissue is collagen. It is structured as three protein strands arranged as a triple helix and is the most abundant protein in the body.

Ascorbate is essential in forming different components of collagen and assembling everything into the triple helix. Severe vitamin C deficiency causes scurvy, in which collagen becomes defective and prevents the formation of strong connective tissue. Gums deteriorate and bleed with loss of teeth; skin discolours and breaks down; and wounds do not heal, just as with diabetes. Along with soft keratin, collagen makes the skin strong

and elastic. Its degradation leads to wrinkles and loose and ageing skin.

Even more important for health is the effect on the blood vessels. Ascorbate deficiency causes them to lose their elasticity; rigid and calcified arteries drive up the blood pressure and they can break more easily. This is especially a problem with aneurisms—ballooning enlargements of arteries with thin walls that can rupture easily (Albert Einstein died of a ruptured abdominal aneurism). In the veins, vitamin C deficiency causes distension and slack walls so that the valves no longer close properly. The blood stagnates in the lower legs and pools to form varicose veins.

Now we can also understand sagging breasts and enlarged prostates as chronic vitamin C deficiencies rather than just the result of advancing age. The prostate story is more complicated and goes like this... Testosterone is partially converted in the testes and prostate into the much stronger dihydrotestosterone (DHT). It is then supposed to go with the blood circulation into the rest of the body. But with chronic ascorbate deficiency, the blood keeps stagnating in or near the prostate, leading to very high DHT levels stimulating prostate growth. The solution is to improve the elasticity of connective tissue. High DHT levels in the scalp are the main cause of male-pattern baldness. It appears that prostate enlargement is the result of DHT combined with a weak venous system (as in PVD), while male-pattern baldness is due to DHT in a congested arterial system (as in CVD). Both, of course, may be present simultaneously.

Copper is also essential in forming connective tissue. Furthermore, plenty of sulphur is required from sulphur-rich vegetables or MSM or both.

All of these problems—ageing skin, rigid arteries, aneurisms, varicose veins, sagging breasts, male-pattern baldness and enlarging prostates—are signs of chronic vitamin C deficiency, commonly in combination with copper deficiency. Copper is also essential in forming connective tissue. Furthermore, plenty of sulphur is required from sulphur-rich vegetables or MSM or both.

In addition to having a high oral intake, it is beneficial to rub sodium ascorbate onto the skin, best after a bath or shower. Just pour some of the powder into your wet hands and rub it on the wet skin, or dissolve a teaspoon of sodium ascorbate in an egg cup of warm water and rub the solution all over the body. Let it dry on the skin without rubbing it off with a towel. For quicker drying, this may be done in the sun or in front of a heater; but the longer it stays wet, the better it penetrates. Alternatively, skin penetration may be improved by dissolving the ascorbate in aloe vera gel or 50% DMSO. Plenty of oral and topical vitamin C also prevents and may remove skin cancers.

Restoring Hair Colour

Hair is coloured by the production of melanin in the hair bulbs. There are two kinds of melanin: eumelanin, which colours the hair brown to black, and pheomelanin, which makes it yellow-blond to red. Different combinations of these two kinds of melanin determine the exact colour and shade of the hair.

White hair results when insufficient nutrients are supplied to the scalp to maintain normal melanin production in hair cells, called melanocytes, or when these cells are damaged by microbes, oxidation or heavy metals, especially mercury. Several nutrients are responsible for converting the amino acid tyrosine into melanin. The most common deficiency is with copper.

A convincing demonstration in regard to copper has been conducted with black sheep. When their feed, containing high and low amounts of copper, was alternated several times, they developed alternating black and white bands in their wool; also, the curliness was reduced when copper was low.[11]

Grey hair contains much less copper than naturally coloured hair. It is not clear if a high-copper hair level due to a high intake of inorganic copper can be used for melanin production, but I assume that it cannot. To restore hair colour, I regard it as most useful to rub diluted copper salicylate solution directly into the scalp, but additional oral intake may be helpful.[12, 13]

Para-aminobenzoic acid (PABA), which is related to the B group of vitamins, helps to produce eumelanin and darkens the hair. Generally, PABA has been effective in 10 to 25 per cent of cases to darken grey or white hair; upon stopping application, the colour tends to fade again after several weeks. In clinical trials, amounts from 400 milligrams up to 15 grams of oral PABA have been used daily. PABA, used orally or topically, is also a natural sunscreen.

PABA itself is not water soluble but may be dissolved in DMSO or by adding about one-third of bicarbonate to PABA suspended in water. Use about half a teaspoon of PABA. After some fizzing, the water will clear and the solution may now be rubbed into the scalp. Additional PABA may be taken internally with meals, but I regard the direct application as more effective. You may buy the water-soluble potassium or sodium salts of PABA, if available.

Other nutrients required to maintain or restore natural hair colour are the B vitamins pantothenic acid, folic acid (in green leaves) and biotin (highest in egg yolk), and the quasi B vitamin inositol. Inositol stabilises cell membranes. This protects the hair bulbs and helps to keep the hair moist and so darkens its colour.

Severe deficiency may cause baldness. In addition, zinc may be required as well as iodine and sufficient calcium and magnesium. Overacidity causes mineral deficiency and premature greying of the hair.

Another cause of fading hair colour is chronic stress. This may be due to emotional stress or to nutritional deficiency, or to chronic infections most commonly related to *Candida*. In the normal metabolism, free radicals and hydrogen peroxide are being formed. These need to be detoxified, otherwise the melanin-producing enzymes are being damaged. Oral as well as topical treatments with fungicides and high amounts of vitamin C are most important to avoid this problem.[14]

From this, it also follows that regularly applying oxidants to the scalp, as in the form of chlorinated water, will lead to premature greying. It also seems to contribute to male-pattern baldness. In addition, drinking chlorinated water or cooking with it, or frying, increases the ingestion of oxidised products and contributes to early greying.

Hair colouring damages the hair, and it may then take longer for a natural colour to reappear. It is not clear if and to what degree completely white hair can regain some natural colouring; this may depend very much on additional measures to improve overall vitality and blood circulation to the scalp.

There is much anecdotal evidence that increased blood circulation to the scalp can restore hair colour. This may be done by frequently keeping the head lower than the heart, such as with inversion equipment or slant boards, or by rubbing irritating substances into the scalp such as a solution of cayenne or some aromatic oils. Most difficult is restoring the colour of the beard, as it is commonly greatly damaged by dental procedures, especially mercury and root canal treatments.

In my experience, it is best to apply both copper salicylate and sodium ascorbate. Depending on the vitality of the damaged hair bulbs, hair can recolour almost instantly, but generally it takes at least several weeks, while some white hair may never recolour. I recommend rubbing some copper salicylate solution into the hair/scalp once or twice a week, but sodium ascorbate preferably daily; just rub some dissolved ascorbate into the scalp or beard. Initially it may come back as a light reddish colour which darkens over time, especially with additional application of PABA.

While vitamin C is known to be good as a treatment for viral infections, recent research has shown that it is actually DHA that is the effective antimicrobial remedy, up to 1,000 times stronger than the reduced form of vitamin C.

How to Use Vitamin C and MSM

Dr Linus Pauling, twice a Nobel Prize winner, pioneered the daily use of 10 grams of vitamin C for the improvement and protection of health. However, even much smaller amounts can cause diarrhoea if taken all at once. Therefore, use it well spread out during the day and night (in case you tend to wake up) but increase amounts only gradually to minimise the possibility of diarrhoea and cleansing reactions. Cut back if problems arise.

It is best to use vitamin C and MSM together, such as up to 10 grams of sodium ascorbate and 10 grams of MSM, and possibly 2–3 teaspoons of 50–70% DMSO rubbed onto the skin at problem areas.

You may either frequently mix the powders with drink or food, or dissolve them in half to one litre of water, juice or herbal tea and sip frequently during the day. If there are indications that you are too acidic and need additional alkalisers, then you may also mix sodium bicarbonate and/or potassium citrate as required with the same drink. You may also add magnesium chloride or magnesium oil, or borax or other frequently taken nutrients, but generally not oxidants such as MMS (Miracle Mineral Solution) or Lugol's solution.

An exception is when you want to oxidise the vitamin C to DHA before ingestion. This can be helpful with infections. Dissolve a teaspoon of sodium ascorbate and one teaspoon of MSM in a large glass of water. Add a teaspoon of 3% or about 10 drops of 35% hydrogen peroxide, a teaspoon of glycerine and a tiny amount of a copper compound. This solution does not need to be refrigerated. Take a sip of it frequently during the day. In this way, you can get a stronger antimicrobial effect with less vitamin C.[15]

While vitamin C is known to be good as a treatment for viral infections, recent research has shown that it is actually DHA that is the effective antimicrobial remedy, up to 1,000 times stronger than the reduced form of vitamin C.[16] These effects can be even stronger in the presence of copper ions. This may be the reason why blood copper levels are elevated during infections and inflammations, just waiting to team up with high levels of vitamin C.

I would generally continue with the 10 grams of vitamin C daily until the treated problem has been resolved, be it to get more energy, deal with chronic disease or liver

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problems, improve connective tissue or just to clean out and strengthen the blood vessels. After about one year or with sufficient and sustained improvement, you may try reducing to 5 grams daily or even less. Young and healthy individuals may remain healthy with several hundred milligrams of vitamin C available from a good diet.

Do not stop a high vitamin C intake suddenly, as this can create a serious rebound deficiency; instead, reduce a high intake gradually. For treating a chronic disease, in addition to a vitamin B complex take 500 milligrams of niacinamide at breakfast and again at lunch. Unless you deliberately want to induce a skin flush, do not use niacin instead of niacinamide. Niacinamide is the main coenzyme for energy-producing redox reactions, and it also has anti-inflammatory properties.

If sodium ascorbate is not available, look for buffered vitamin C. This may contain, in addition to ascorbic acid, ascorbates of calcium, magnesium, potassium and sodium or, more commonly and cheaper, these minerals as carbonates. Buffered vitamin C is preferable with kidney disease, water retention and high blood pressure problems. Alternatively, you may use ascorbic acid and neutralise it in water by adding two parts to one part of sodium bicarbonate or mixed potassium, magnesium and calcium carbonates shortly before ingesting. You can drink it while it is still fizzing.

In most European Union countries except the UK (see www.ebay.co.uk), sodium ascorbate powder in kilogram quantities is not available for human consumption, and it is very expensive and difficult to obtain even for veterinary use. These restrictions are most severe in Germany. Ascorbic acid is increasingly vilified in German Internet articles. Ascorbic acid in kilogram amounts is only available as a food preservative, not as a vitamin, and buyers may be checked to make sure that they do not intend to use it as a vitamin. I have no doubt that this attack originates from the German pharmaceutical industry, which now tries to extend the German and EU ban on natural remedies worldwide with the Codex Alimentarius regulations and in coordination with similar draconian US FDA regulations.

A few words of caution: these recommendations reflect my present understanding, but this program is experimental and I cannot take responsibility for any problems that may arise from implementing it. ∞

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Endnotes

1. Science Blog, "How vitamin C stops the big 'C'", 10 September 2007, http://tinyurl.com/m95lg83
2. Gregg, David W., PhD, "DMSO and MSM: The Biochemical Oxygen Transport Pair", http://tinyurl.com/m4kzw5f (different examples are from other pages of this website); see coverage of Dr Jacob's research at http://tinyurl.com/kodxy9h
3. Pekker, Michael, "Niacinamide (Vitamin B_3) May Prevent Alzheimer's Memory Loss", 30 August 2010, http://tinyurl.com/kp6sw23
4. Hoffer, Abram, MD, PhD, "Vitamin B-3: Niacin and Its Amide", DoctorYourself.com, http://tinyurl.com/4v9o5rx
5. Last, Walter, "Cancer Therapy – A New Direction", http://tinyurl.com/byzt9hz
6. Gregg, David W., PhD, "Cancer Health Notes", http://tinyurl.com/mqwsonp (also see the linked pages .../cancer2.htm and .../cancer3.htm)
7. Rath, Matthias and Linus Pauling, "Solution to the Puzzle of Human Cardiovascular Disease: Its Primary Cause is Ascorbate Deficiency Leading to the Deposition of Lipoprotein(a) and Fibrinogen/Fibrin in the Vascular Wall, *Journal of Orthomolecular Medicine* 1991; 6(3&4):125-134, http://tinyurl.com/lt7us5s
8. Rath, Matthias, MD and Linus Pauling, PhD, "A Unified Theory of Human Cardiovascular Disease Leading the Way to the Abolition of This Disease as a Cause for Human Mortality", *Journal of Orthomolecular Medicine* 1992; 7(1):5-15, http://tinyurl.com/l2pmp3z
9. Last, Walter, "Natural Therapy for Hemochromatosis", http://tinyurl.com/kcbblw9
10. Last, Walter, "Antioxidants for Haemochromatosis", *International Clinical Nutrition Review* 1991; 11(2):71-74, http://tinyurl.com/kowbvjb
11. Adams, Ruth and Frank Murray, *Minerals: Kill or Cure?*, Larchmont Books, New York, 1974
12. Last, Walter, "Copper Salicylate: A Potent Inflammation Fighter and Rejuvenator", http://www.health-science-spirit.com/copper.html
13. To buy copper salicylate, see http://www.strideintohealth.com
14. Klotz, Irene, "Grey hair? Blame the bleach", Discovery News, posted at ABC Science, 4 March 2009, http://tinyurl.com/ycef6dx
15. Patent US 8324269 B2, "Stable compositions of dehydroascorbic acid", http://www.google.com/patents/US8324269
16. Furuya, Ayami et al., "Antiviral effects of ascorbic and dehydroascorbic acids *in vitro*", *International Journal of Molecular Medicine* 2008 Oct; 22(4):541-545, http://www.spandidos-publications.com/ijmm/22/4/541