HUNZA WATER

AND ITS RE-CREATION BY MEANS OF THE FHES MINERAL POWDER

Summary of Research Studies

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1. Preface: Centenarians of the Himalayan Valley of Hunza

In one of his numerous visits to Gilgit, the capital of the Himalayan region in northern Pakistan, British colonel Reginald C.F. Schomberg drew the attention of his companion, a local, to a group of walkers far away in the mountains. “They must be Hunzakuts,” answered the man. “How can you tell from this far?” asked the colonel, surprised. “Look how fast and light their step is.” (Schomberg, 1938).

The inhabitants of the Hunza Valley in the Himalayas have long been known for their high number of centenarians and their good health. News about them reached the world over one hundred years ago. In the early 20th century, doctors and scientists began studying the health and psycho-physical abilities of the Hunza people. After performing a medical check-up on the inhabitants of this valley, physician Robert McCarrison (1936) reported on their extraordinary fitness and longevity. Although some doubted the credibility of official records of their actual ages, experts count the Hunzas among the peoples with the greatest longevity and a low incidence of chronic degenerative diseases (Leaf 1973, Keller 1978, Taylor 1962, 1964). A study by a group of cardiologists found the condition of the cardiovascular system in the centenaries from this valley to be extraordinary, and pointed that out as the possible key factor in their longevity (Murray, Murray 1984).

A comparative analysis of lifestyles of longevous mountain peoples around the world has shown that in addition to the fresh high-altitude air, the qualities they all share are a modest diet containing lots of seasonal fruit and vegetables and not much red meat, following the circadian rhythm, high physical activity, a stress-free life with pronounced social awareness, an unpolluted environment, and potable water rich with minerals and antioxidants (Poljšak 2012, Vlahchev, Zhivkov 2002).

These factors undisputedly contribute to living healthily, but there are many peoples in the Himalayas and other parts of the world leading a similar lifestyle, yet with much fewer centenarians living in their midst. As it turns out, the water flowing from the Ultar glacier rising above the Hunza Valley, has particular qualities. It more closely resembles water found in living organisms than ordinary potable variants. For this reason it may be called ‘living water.’

After finding similar water of glacial origin in other parts of the world that are also known for a high number of centenarians, experts associated the sound health of the local population to the quality of their water (Hopps 1975). Dr. H.M. Coandã and Dr. P.G. Flanagan made an invaluable contribution to the studies of such waters, and Dr. Flanagan even succeeded in creating a powder of minerals found in Hunza water, which turns ordinary water into ‘living’ water.

This powder, named FHES – Flanagan Hydrogen Enhanced Silica by Dr. Meyers, first appeared in the market in September 1997. Since then, it has been sold as a dietary supplement under different trade names (Microhydrin, Active H, Hydrogen Boost, Mega H-, MegaHydrate). Its characteristics changed in the course of the development of the supplements, but the main active substance in all of them (except in Active H, which is no longer in the market) remains silica hydride. There have been nine scientific papers published about the properties of Flanagan’s silica hydride and its effects.

The present booklet summarizes research findings about Hunza water and FHES (silica hydride), with testimonials by physicians and individual FHES users added in the margins. This topic is covered more extensively in the book *Living Waters* (Ostan 2013).

This booklet is provided for educational and informational purposes only. The author declines all and any responsibility for the use of FHES-type dietary supplements for medicinal purposes.

2. The Secret of Hunza Water Revealed

Discovering the secret of Hunza water has not been easy. On the one hand, this water is closer to distilled than plain tap water. It does not consist of mainly ions of various dissolved minerals as ordinary water does, yet it is exceptionally rich in minerals and elements in traces, which are not decomposed; they exist in the form of stable, very small minerals – colloids – suspended in the liquid (Tompkins, Bird 1992). The water is cloudy and for this reason called 'glacial milk.' It differs from ordinary potable water in many physical and chemical properties (Dove, Rimstidt 1994, Flanagan, Purdy Lloyd 1999). Which substances in this multitude of minerals are essential in providing Hunza water with special properties?

Decades of research have led to the discovery of two intertwined, key characteristics:

1) The water contains quartz (silica) **minerals in particularly small, colloidal** form.
2) The water has **antioxidant properties**.

Ad 1) **Colloids** are small solid parts of matter that do not dissolve in water (i.e., they do not decompose into ions), ranging from 10 to 10.000 nm (1 nanometre = 1 millionth of a millimetre) (Barbič, Bošnjak 1998). Nanocolloids are even smaller, as none of them exceeds 10 nm in size (Flanagan, Flanagan, Elixir).

In such small dimensions, matter displays distinctive properties: in colloids and particularly in nanocolloids, the electrons, which usually circle an individual molecule, begin moving around the entire 'mineral.' This causes a veritable crowd of electrons on the surface and thereby a strong negative energy or anionic charge. The smaller the mineral, the greater its negative energy charge. Colloids act on water molecules like tiny magnets. Water molecules arrange themselves around them into special structures (Fig. 1) and do not float freely as they do in ordinary water. Also, since they are attracted by the colloids, they do not 'bump' against the water surface as forcibly as they normally would; with its surface tension thus reduced, the water becomes more hydrophilic and substances dissolve in it more easily.

The human body produces such colloids in the process of metabolism when it breaks down food into smaller parts. During this same process, it also turns the tap water that we drink and which has a high surface tension (between 72 dyn/cm and 78 dyn/cm) into 'living' water. The surface tension of blood in healthy and fit people is 45 dyn/cm. Only such water can efficiently carry nutrients into cells and toxins out of them. Colloids are thus essential to ensuring the **transport ability** of bodily fluids. In the Hunza Valley such minerals are produced by the Ultar glacier, which flows slowly to the lowlands and in the process grinds flint sand into very fine powder. The surface tension of Hunza water is 58 dyn/cm (Flanagan 2012). Fig. 1 shows a silica colloid in water.

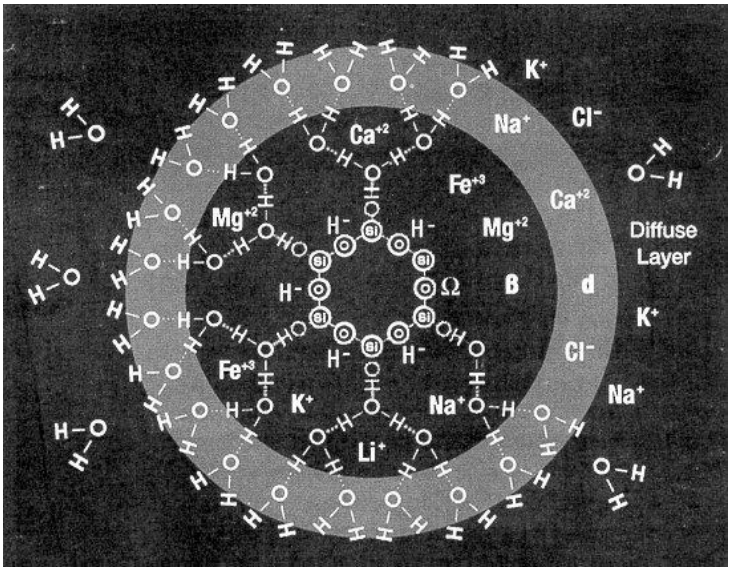


Fig 1: Silica colloid – the essence of Hunza water

The silica colloid mineral (the circle in the middle, composed of silica and oxygen atoms) acts in water like a magnet. It attracts water molecules, thus making the liquid more hydrophilic and allowing it to carry nutrients (the image shows iron, magnesium, calcium and other ions, as well as water molecules) into the cells and toxins out of them more easily. Next to the colloid there are also hydrogen anions (H^-). These are essential to the production of energy in the cells and to the protection of the latter against harmful effects (source of image: Dove, Rimstid 1994).

Ad 2) The second important characteristic of Hunza water is its **antioxidant property**.

Chemists classify substances into oxidants and reductants. While oxidants are the substances that gain electrons, reductants are those that donate them. The latter can also be called antioxidants. In living beings, the level of antioxidants depends on the available amount of hydrogen, for electrons are borne around the organism together with hydrogen. In addition to colloids, Hunza water contains quite a large amount of hydrogen in its anionic, active form (H-). Such hydrogen possesses one extra electron in addition to the one it normally has.

The oxidation or antioxidant level of a substance is measured by means of an **rH indicator** (hydrogen partial pressure)[1]. rH values over 28 denote oxidation, values under 28 denote reduction. Plain water is oxidised, its rH value is customarily 28 or higher. To function properly, the cells of a human organism need an antioxidant environment; rH values of the blood of young athletes range between 21.5 and 23.5 (Greenberg 1999:4). With age, the antioxidant level of blood decreases; in healthy individuals aged between 40–50 it is down to rH 25 already (Smith, Purdy Lloyd, Phelps 1998). The higher the rH value of bodily fluids, the poorer the antioxidant protection and the greater the danger of degeneration and early ageing. The rH value of Hunza water ranges between 18 and 20 (Ostan, Flanagan 2005). This means its antioxidant level is higher than that of the blood of young and healthy individuals. This is probably one of the important reasons why there are so few degenerative diseases found among the inhabitants of the Hunza Valley and so many hale and hearty centenarians.

[1] The ability of a substance to gain or lose electrons is normally measured with the oxidation-reduction potential (ORP). In concrete redox processes, of which reactions in living organisms are also part, this ability also depends on the levels of acidity and alkalinity (pH). To take account of both factors, W.M. Clark applied a variation of the Nernst equation way back in 1923 (Clark 1923, Stephanson, Flanagan 2004b). A simplified calculation of the rH, also used by Dr. Flanagan (and myself), is rH = (ORP+204)/30 + 2*pH.

3. Development and Physical Properties of FHES

Among the scientists who studied Hunza water, Dr. H.M. Coandã (1886-1972) and Dr. P.G. Flanagan (1944–) deserve a special mention, for they both wanted to get to the essence of Hunza water and re-create it. Dr. Coandã, considered one of the pioneers of hydrodynamics, first visited the Hunza Valley back in 1907. He is celebrated for many scientific discoveries and patents, but re-creating Hunza water is one goal he failed to achieve. In 1964, he retired and relinquished his scientific legacy to the then 20-years-old scientist Patrick G. Flanagan. Flanagan had registered his first patent – a device called 'Neurophone' (U.S. Patent no. 3,393,279) – at the early age of 14, at 17 he was already working with Dr. Coandã and other scientists on science projects. At only 18, he was ranked by *Life* magazine among the 10 most promising American scientists (Moser 1962). At the time, Dr. Coandã believed that only as brilliant a scientist as Patrick Flanagan could succeed in re-creating Hunza water, and handed the task of achieving that over to him. And Flanagan did succeed, but it took him another 20 years of research and development work to do it. In 1997, his powder, which has the ability to turn plain water into Hunza-like water, was put in the market for the first time.

Flanagan's FHES powder, the main ingredient of which is, as we said, silica hydride possesses both of the principal properties of the minerals in Hunza water:

It contains quartz colloids like those found in Hunza water, only much smaller. We speak about silica nanocolloids, the units of which do not exceed 5 nm (5 millionths of a millimetre) in diameter. These are the smallest quartz colloids known so far, which fact has been corroborated by several independent scientific studies. Dr. K.J. Reid from the University of Minnesota and Dr. B.J. Marlow from the University of Massachusetts, have confirmed that Flanagan's colloids are indeed extraordinarily small and constitute one of the greatest discoveries in the scientific study of colloids (Flanagan, Flanagan 1998a:8).

Dr. Flanagan succeeded in creating such colloids already in phase one of his developmental work. This product has been on the market since the early 1990s in the form of a liquid called Crystal Energy. Eight drops of these colloids in two decilitres of plain water reduce its surface tension (which is approximately 73 dyn/cm) to the level of blood surface tension (between 43 and 56 dyn/cm) – depending on the quality of the water (Flanagan 2012).

Although silica colloids represent a significant developmental achievement in themselves, they do not suffice to create water like that from the Hunza River, for the latter has a much higher content of antioxidant hydrogen. Dr. Flanagan had long struggled with the question as to how the colloidal silica in Hunza water managed to absorb that many hydrogen anions (H^-). Eventually, he discovered that it was due to the water's whirling in the river rapids.

Laboratory measurements have shown that inside a whirlpool, electrical tension of up to 10,000 V is generated between water and air (Tompkins, Bird 1992). With a specific procedure composed of 33 phases, including one consisting of a special rotating of the water, Flanagan succeeded in getting silica colloids to trap a huge amount of hydrogen anions (H^-) (Ostan, Flanagan 2005).

Although hydrogen has a triflingly small atomic mass it represents as much as 17% of the weight of Flanagan's silica hydride (Stephanson, Flanagan 2002c). This huge mass of hydrogen anions in the colloids, which are slowly released into the water when they come in contact with it, provides Flanagan's silica hydride with extraordinary antioxidant properties, much stronger than those of original Hunza water.

I have already mentioned that the rH value of Hunza water is between 18 and 20. The early forms of commercially available FHES (MicroHydrin) had, even according to our own measurements, an rH value of around 6 (a lower rH indicates greater antioxidant properties). Contemporary forms of FHES regularly record rH values between 1 and 3, and frequently 0 or even lower, which represents the absolute degree of reduction. These are extreme theoretically achievable levels of reduction.

Table 1: rH (the antioxidant level) of various substances (lower is better)

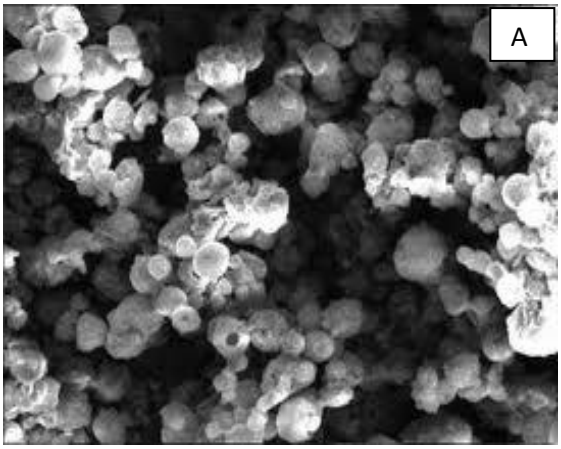
	rH
ordinary potable water	26-32
β-carotene	26
blood of young athletes	**21.5-23.5**
vitamin C	23
Hunza water	18-20
fresh-pressed organic juices	13-15
FHES (Flanagan Hydrogen Enhanced Silica) - mostly - (extreme rH values of FHES, measured between 2000 and 2015)	**1-6** (from -1.5 to 11)[2]

Sources: Ostan, Flanagan 2005, and measurements by Prof. Dr. Vlado Barbič and Prof. Dr. Polonca Trebše from the University of Ljubljana

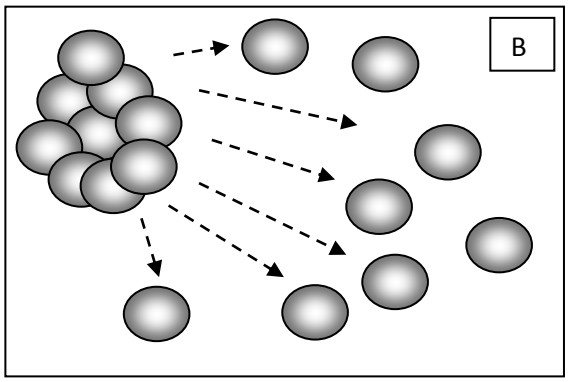
Let me explain the rH values in the table above. The rH indicator is in essence a negative logarithm value, therefore an rH value lower by one unit denotes 10 times more electrons (i.e., hydrogen anions) available. The rH of organic juices ranges from 13 to 15, which indicates much stronger antioxidative power than that of vitamin C (23) or β-carotene (26). On the other hand, a glass of water with added FHES (even in its early form of Microhydrin) contained at least as many electrons as one million glasses of the best fresh juice made from organic fruit and vegetables. And the contemporary forms of FHES are at least 1,000-times richer in the amount of anionic hydrogen.

Flanagan's silica hydride comes in the form of colloids which function like little cages trapping hydrogen anions. As it is consumed (getting in contact with water), the trap releases hydrogen anions (see Fig. 2). As a result, the water contains silica colloids and hydrogen anions. Each of them represents an exceptional scientific and technological achievement in terms of physical characteristics. Still, for the users this is not enough. What is still required is evidence of FHES's beneficial effect on physiological processes and of the non-toxicity of its use. The following chapters will address those. I would like to begin with an overview of studies of the impacts of FHES on physiological processes depending predominantly on colloids, and continue with the findings concerning its antioxidative effects.

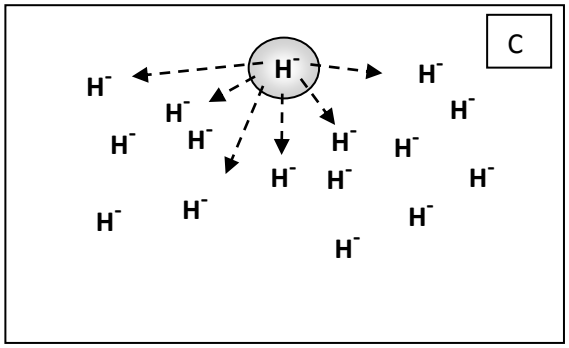
[2] According to the internal criteria of the FHES manufacturer, the product has to reach ORP values of -400 mV or lower. If ORP were (only) that low and the alkalinity of the product extremely high (e.g., pH 10), the rH of the product would range around 13. We have not yet come across an FHES series with that weak an antioxidant potential, which would nevertheless still be on the level of the best fresh organic juices. The rH measurements of FHES delivered to Slovenia are regularly carried out by the Faculty of Health Sciences, University of Ljubljana.



FHES consists of powder containing round 'lumps' of silica colloids (globules in Fig. A). These are Flanagan's 'microclusters.' Each of them measures but a few thousandths of millimetre in diameter, and each lump contains thousands of colloids not larger than 5 nm (millionths of millimetre).



In contact with water the microcluster starts to decompose into individual colloids (Fig. B).



Flanagan's silica colloid is like a cage trapping hydrogen anions (H^-). In contact with water, the colloid begins to release hydrogen anions (Fig. C), which makes the water antioxidative. The water thus contains two important active substances: colloidal silica and hydrogen anions (H^-).

Fig. 2. How FHES behaves in contact with water *(Source: Stephanson, Flanagan 2002c)*

4. Physiological Impacts of FHES

FHES Improves Cellular Hydration

A very common problem of modern man is dehydration of the organism. We should drink at least 1.5 litres of water or raw juices (sodas and other beverages do not count towards this quantity) daily, which most modern people do not do (Ostan et al. 2001). It is estimated that nowadays as many as 75% of the people in the US are chronically dehydrated (Flanagan 2012). A dehydrated cell becomes catabolic; i.e., uses its own tissue for the production of energy. This leads to the deterioration of the cell's health. Chronic dehydration can cause dizziness, headache, fatigue, dry mouth, back pain, anxiety, erectile dysfunction, and premature wrinkles as a sign of early ageing. It also impairs the responsiveness of the immune system, which can lead to the emergence of allergies and the development of autoimmune diseases, such as lupus, multiple sclerosis, rheumatoid arthritis and others (Flanagan 2012). The problem is that the lack of water in the human body is not felt as thirst, but rather as tiredness and hunger.

However, even if we drink enough water it can still happen that the cells are left dehydrated. As Dr. Flanagan finds: "After years of research with my fellow scientists I was shocked to discover that I might still be dehydrated after drinking eight glasses of water a day" (Flanagan 2012). Ordinary tap water with a surface tension of 73 dyn/cm does pass through the intestinal wall into the blood and lymph, so it does circulate around the body, but "without decreasing its own surface tension it cannot penetrate the cell" (Flanagan 2012). A healthy and vigorous intestine is able to process plain water into a more hydrophilic form, but nowadays this aspect of the digestive function is weak even in children.

The colloids in FHES decrease the surface tension of water to 28–45 dyn/cm, which enables FHES to penetrate into the cells (see Fig. 3).

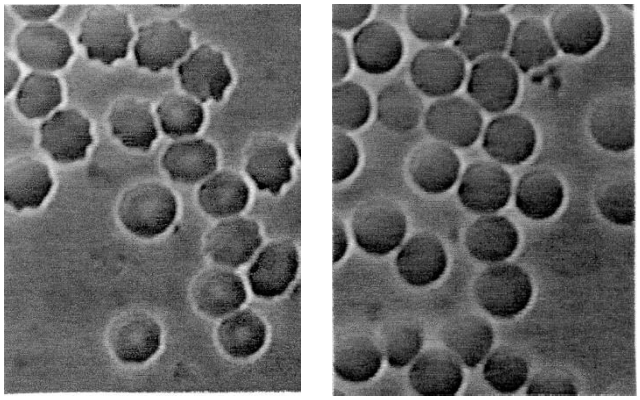


Fig 3. Cellular hydration by means of FHES
On the left is an enlarged image of ***the red cells of a healthy 11-year-old*** *who observes an ordinary modern diet. Some of the cells are crumpled, which is an indication of their being dehydrated. Eleven minutes after drinking FHES-revived water (image on the right) the boy's red cells became completely normal. (The images are published by courtesy of the homeopathic doctor Jane Shiloh; source of images and information: http://alternative-health-4u.com; August 2000.)*

It is worrisome that nowadays even children, who are by nature more vital than adults and the elderly, are dehydrated. Water makes up as much as 80% of the body of a newborn baby, its share in the body of an adult falls to around 70%, while in an elderly person it is reduced to mere 50% or even less (Poljšak 2012: 47).

FHES can increase cellular hydration in adults and the elderly, too. In a double-blind experiment involving the elderly (subjects with a low water content in the organism) the members of the test group took 4 capsules of FHES daily. In two weeks, the share of water in their bodies increased from 45% to 48%, and their feeling of general well-being improved, as well. Even a slight water insufficiency (2% of body mass), in fact, compromises the physiological and mental processes in the body (Flanagan 2011a).

FHES Improves the Transfer of Substances into the Cells and the Removal of Waste Out of Them

Even cells have an energy charge. In a healthy and strong organism, the cells have a negative energy charge and as such repel one another like same-pole magnets. This is essential to their proper functioning. Each of our cells is enveloped by water; only in such circumstances can the cell receive the necessary nutrients and discard waste matter into the interstitial fluid. If the charge is weak, the cells in the blood and elsewhere clump together.

If the cells are clumped together, a smaller part of a cell's surface is available for substances to pass through. The nutrition of the cell with oxygen, fuel and essential micronutrients is reduced.

A reduced capacity of removing waste products of cellular metabolism from a cell causes cellular toxaemia and acidification (waste is acidic), thus increasing the body's risk of falling victim to viral diseases, as viruses only multiply in acidified cells (Alberts et al. 1994).

The problem of cell clumping is more frequent in older than in younger people, for the efficiency of colloid production in the digestive process drops with age. Similar problems are also frequent in psycho-physically exhausted individuals.

A stronger energy charge and a more intense ungluing of the cells can be achieved in several ways; for example, by following a diet of colloid-rich food. Colloids have the so called 'zeta potential' (tension expressed in millivolts, which is calculated based on the measurements of the mobility of colloids – electrophoretic mobility; Barbič, Bošnjak 1998), which enables them to bestow an energy charge on cells as well. It has been experimentally proven that FHES, being rich with nanocolloids, contributes to the ungluing of cells (see Fig. 4 below).

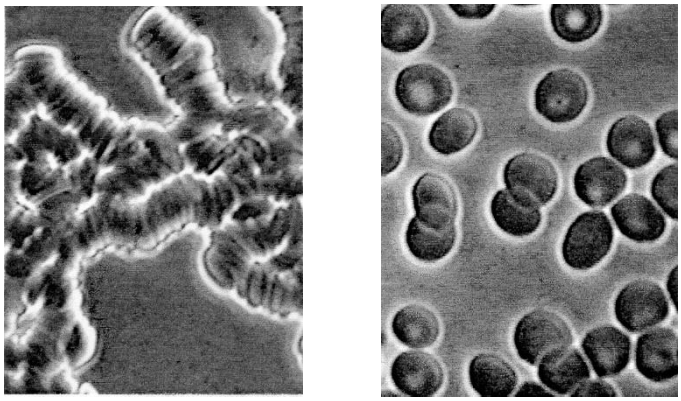


Fig. 4: FHES helps the cells to unglue

In an adult sick person the red cells do not repel one another strongly enough due to an insufficient energy charge, often clumping together instead (image on the left). The transfer of oxygen to the cells is thus hindered. Fifteen minutes after taking FHES (image on the right) the cells of an adult patient normalised. (Images published by courtesy of the homeopathic doctor Jane Shiloh; source of images and information: http://alternative-health-4u.com; August 2000)

The ungluing of cells improves the passage of substances through cell membranes. Flanagan's colloids augment the 'wettability' of water as they decrease its surface tension to the level of blood (45 dyn/cm) or even lower. Tests have shown that Flanagan's colloids increase the absorption of elements through a semipermeable membrane by up to six times (Flanagan 2012).

FHES is not the only foodstuff with such capacity. Raw juices, which are rich in colloids, also have it: the surface tension of fresh carrot juice is 30 dyn/cm, that of lemon juice 33 dyn/cm, while that of contemporary forms of FHES is 34 dyn/cm (Dr. Patrick Flanagan – personal communication).

FHES Increases the Efficiency of Cellular Energy Production

The 2001 survey I conducted among 126 users of FHES showed that 85% of them felt an improvement in health or well-being (72% of them even without the initial detoxification nuisances), 12% felt no effect at all, while 3% stopped taking FHES because of the discomfort in the initial stage of the regimen. Among the most frequent effects of taking FHES, the users stated 'a feeling of greater energy.' This can sound surprising, as FHES is a calorie-free foodstuff, but several tests have confirmed that FHES increases the production of cellular energy (ATP). The reason for this is in the high content of anionic hydrogen (H^-) in FHES, which increases the efficiency in the generation of energy. Let me explain this process a little.

Cells produce energy in their organelles – mitochondria. The process takes place in the inner mitochondrial membrane and is led by protein sets (complexes I, II, III, IV and V) called an electron transport chain. Into the chain goes hydrogen as raw material, and out comes ATP, the 'explosive' molecule fuelling all life processes (Fig. 5).

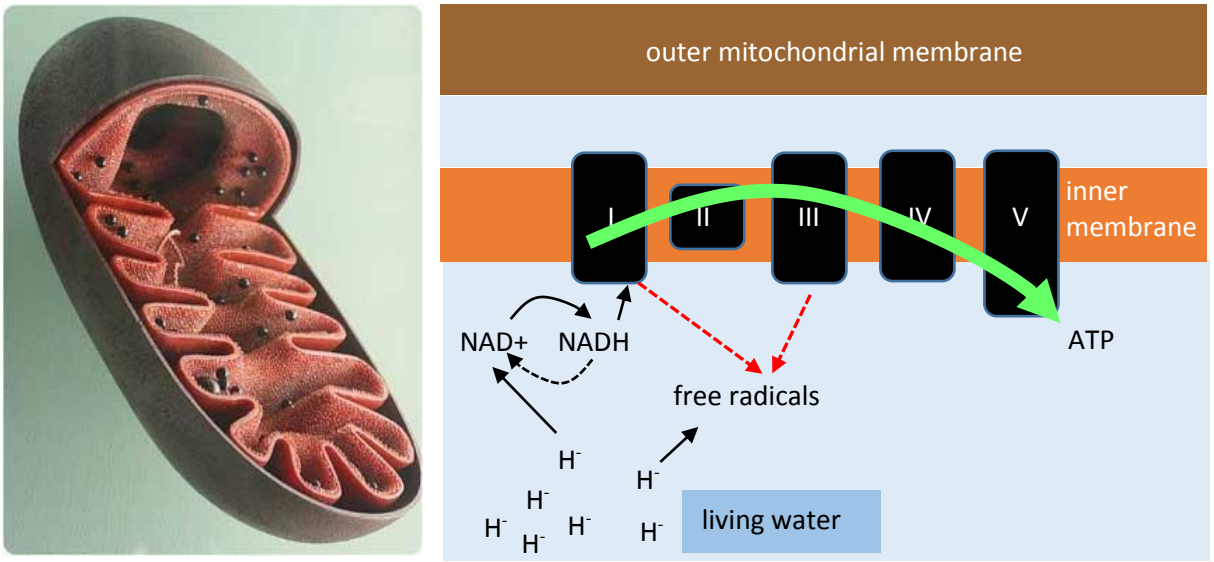


Fig. 5: Double role of living water in cellular energy production

The cell produces energy in its organelles – mitochondria (left). A mitochondrion consists of two chambers: the inner space, and the space between the inner and outer membranes. The cell obtains hydrogen from food and transfers it with the help of coenzyme NADH into the electron transport chain in the inner membrane (right). This chain is composed of five protein complexes, and at the end of it cellular energy in the form of ATP (adenosine triphosphate) is produced. Anionic hydrogen (H-) increases the efficiency of the electron transport chain, for it enables an increased production of energy from the same amount of caloric food. At the same time, the hydrogen anions efficiently neutralise free radicals, an inevitable side product in the generation of ATP.

To produce this much needed life energy, it is essential for the cell to have sufficient hydrogen available. Our cells mostly obtain it by decomposing the carbohydrates, fats and proteins provided through our intake of caloric food. The recipe for more cellular energy appears quite obvious: the more (caloric) energy sources we consume, the more energy our cells will produce. But it is not that simple. One of the very important conditions for producing energy in the mitochondria is a high antioxidant (reduction) level of the liquid contained in them.

As mentioned before, the average rH value of the blood of young athletes is 22.5, which means its antioxidant level is quite high (rH under 28). The concentration of anionic hydrogen in such blood is therefore considerable, but in particular compartments of the cell it has to be even greater. Such a compartment is located near the mitochondrial electron chain. Cellular energy production is a gradual and very complex process – it resembles the gradual drawing of an already tightened bow. Each further stage requires a higher antioxidant level. An important intermediate role in this process is performed by coenzyme NADH, which passes hydrogen to the electron transport chain at its beginning. The rH value of this coenzyme is 11.7 (ORP -320 mV; Flanagan, Purdy Lloyd 1999). The concentration of active hydrogen here is almost unimaginably high: it is 100-billion-times greater than in the blood of a young healthy person. When coenzyme NADH donates the hydrogen to the chain, it changes into its oxidised form of NAD+, which has to be enriched by hydrogen again in order to pass it on into the chain. The higher the concentration of active hydrogen (H-) in the surroundings, possibly at an rH level lower than 11.7, the easier and faster this passing on takes place.

For the human organism, this task gets even more difficult with age, because the blood of healthy individuals aged between 40 and 50 has an rH value of 25, which means that it contains at least 100-times less anionic hydrogen than the blood of young individuals. This is not to say that older people cannot generate life energy from food, it is just that the energy so generated is not as abundant as it used to be in their youth.

We can help the organism in this effort by choosing an appropriate diet. The most common source of energy is cooked food, but since it is mostly oxidised (rH higher than 28), it is poor in anionic hydrogen. Fresh juices are a very rich source of that, though even the best fresh-pressed juices from organic fruit and vegetables cannot reach the rH value of 11.7, which is required in the production of energy (reduction of NAD+ into NADH). This, on the other hand, can be achieved by FHES, for even its first marketable forms reached rH values of 6, while the more recent variants reach values of 1-3 or even lower (according to the measurements conducted by Prof. Barbič and others). In principle, such food should facilitate and accelerate the production of energy (ATP) in the cells considerably. This was also corroborated by studies conducted by Dr. Stephanson and Dr. Flanagan (2004a,b): “In the samples of mitochondria the [NADH]/[NAD+] ratio increased twofold, the quantity of ATP fivefold, while the quantity of glucose decreased by half” (Stephanson, Flanagan 2004a:82). This means that the cells, **without any additional food,** but with the help of FHES, used the available glucose **better**. This is the key to understanding the significance of living water in terms of energy: the cells are able to produce more energy utilizing a given food, because of the **improved efficiency** of its production.

FHES Provides Effective Protection against Free Radicals, Which Cause Ageing

Free radicals are molecules or atoms that have one or more unpaired electron. They are characterised by electron imbalance and therefore very reactive. They can have positive effects on biological processes, but negative ones, too. If the organism does not succeed in neutralising them with antioxidants (vitamins and other antioxidant agents), they steal electrons from cellular molecules and damage the cell structures. Free radicals are the most powerful toxins in the human body. The surplus of free radicals over antioxidants is called oxidative stress. Though the organism

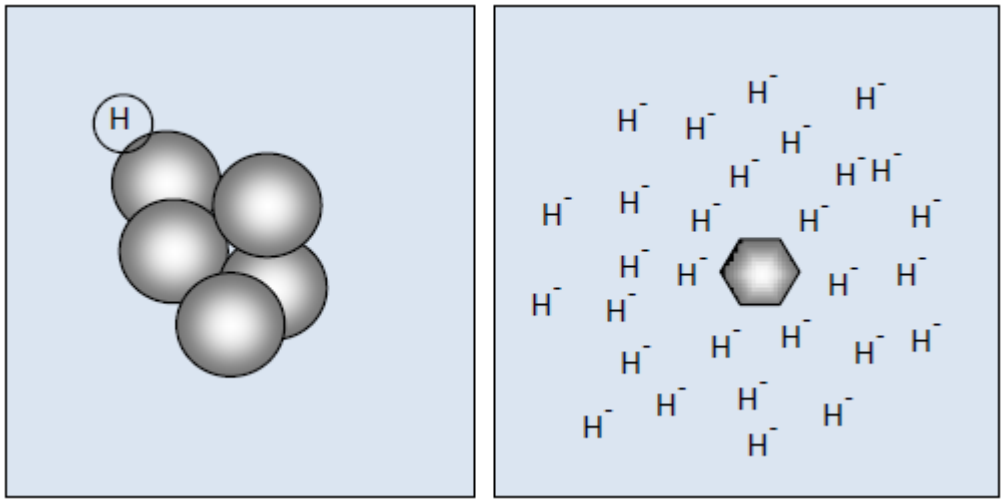
can eliminate its consequences to a degree, much of the damage is permanent. The damaged cell degenerates, grows old and eventually dies. Ageing and age-related degeneration are thus processes caused by free radicals or oxidative stress (Halliwell, Gutteridge 2005).

We usually think that substances that are damaging to the cells mainly originate in the environment outside the organism. It is true that many harmful substances come from the outside, but the most important source of free radicals is internal. In fact, the main point of origin of toxic substances is precisely the previously mentioned process of mitochondrial energy production, in which 1-3% of oxygen used in the electron transport chain converts into free radicals (Halliwell, Gutteridge 2005). This is the taproot of these 'seeds' of death. A larger energy production generally entails a larger production of toxic waste: especially of the *superoxide* free radicals, which can develop (via hydrogen peroxide) into extremely dangerous *hydroxyl* radicals.

> *This is how free radicals are generated in the mitochondria:*
> *In complexes I and III of the electron transport chain (Fig. 5), free radicals of the* ***superoxide*** *type ($O_2^{\cdot -}$) are first produced (Speakman 2003). Their life span is a few milliseconds. The shorter the life span of a reactive oxygen species, the more dangerous the species. A part of these free radicals damage the adjacent molecules, while part are successfully neutralised by the antioxidant superoxide dismutase (SOD), produced by the body itself. The product of this reaction is hydrogen peroxide (H_2O_2), which is also classified among reactive oxygen species (ROS) and can do damage, but it is not a free radical. Its life span can be as long as a few minutes, which gives the organism quite some time to neutralise it and change it into a less hazardous matter. For this reason it is not directly as dangerous as other reactive oxygen species. Also, there exist antioxidants specialised in neutralising hydrogen peroxide (glutathione peroxidase and catalase). But although hydrogen peroxide could be classified as one of our 'meeker' foes, it is a genuine Trojan horse in the damage caused by free radicals. Since it is quite durable, it has enough time to pass from the mitochondrion into the cell's interior (cytosol) and other organelles (including the nucleus). Even there the cell can easily neutralise it, transforming it into an even less dangerous substance. However, it often happens that on this path hydrogen peroxide comes across substances that intensify its destructive power. Various carcinogenic substances, nitrates in drinking water, nicotine, alcohol, and most often iron, copper and other metals that the organism otherwise needs for its normal functioning turn hydrogen peroxide into extremely destructive* ***hydroxyl radicals*** *($OH^{\cdot}$)****,*** *the life span of which is but a few microseconds.*

Since FHES increases cellular energy production, scientists have wondered – justifiably so – if oxidative stress is increased with it, too. The concrete question they wanted to answer was: 'Is FHES effective in neutralising the two principal species of free radicals associated with mitochondrial energy production, i.e., superoxides and hydroxyls?' Researchers from the University of Minnesota and Northwestern Health Sciences University in Bloomington first added hydroxyl and superoxide radicals to laboratory cells in such elevated doses that nearly all the cells died (only 0.6% of them survived). Then they repeated the test, subjecting the cells to the same amount of free radicals, but this time also adding antioxidants in concentrations as recommended by the manufacturers. Among other things, they verified the effectiveness of FHES, vitamin C and coenzyme Q_{10} (Stephanson, Stephanson, Flanagan 2002a,b).

Cells protected by coenzyme $Q_{10,}$ vitamin C, and FHES (in a concentration corresponding to the recommended 4 capsules per day in an adult) had a survival rate of 25.1%, 71.0%, and no less than 91.6, respectively. The fact that FHES displayed greater protective power than the renownedly efficient antioxidant vitamin C and other tested antioxidants is probably the result of greater content of antioxidative hydrogen in FHES, and of the specific antioxidative activity of FHES, less burdensome for the organism (see Fig. 6).



Ordinary antioxidant in water FHES dissolved in water

Fig. 6. Similarities and differences in the activity of FHES and ordinary antioxidants

A common characteristic of all substances with antioxidative properties is the content of hydrogen as an active substance. The latter, together with the electron, is used for the neutralisation of free radicals. FHES differs considerably from ordinary antioxidants in several respects:

*- **The amount of hydrogen** used to prevent oxidation is **much greater** in FHES. A molecule of an ordinary antioxidant (above left) only possesses one atom of available hydrogen. The mass of hydrogen as the smallest of atoms, is minuscule, while the mass of the remaining part of the antioxidant, carrying the hydrogen, is large. We could describe it as a "big cart for a small cargo." In FHES, a tiny colloid releases billions of hydrogen anions, which form as much as 17% of the mass of silica hydride.*

*- In the process of the utilisation of anionic hydrogen, **FHES does not transform into a free radical**, which as a rule occurs in ordinary antioxidants. In these, antioxidative hydrogen is part of the chemical compound. When the antioxidant, for example vitamin C, donates the hydrogen, the compound is 'impaired,' turning into a weak free radical, which has to procure hydrogen from another antioxidant, and the process is repeated. The last free radical generated in this chain of reactions is neutralised by the hydrogen anion contained in the living water within the organism.*

In FHES, hydrogen anions float freely around the colloid. When such an anion is utilised to neutralise the free radical, the colloid does not become impaired. If, for instance, anionic hydrogen (H^-) is used for the neutralisation of the very harmful hydroxyl radical (OH^-), the synthesis of the two elements only produces a molecule of ordinary, harmless water (H_2O) (Stephanson, Flanagan 2003).

What is required for a good antioxidant protection is anionic hydrogen from the living water and specific antioxidants, irreplaceable in certain biological processes.

It turned out that an increased dosage of FHES also increased the protection against free radicals. At a concentration corresponding to a daily dose of 5.2 capsules in humans no less than 99.9% of the cells survived. Their survival rate was even higher than that of the control group (99.2%), in which the cells were not subjected to any toxins or antioxidants at all and died naturally (Stephanson, Stephanson, Flanagan 2002a,b). Other *in vitro* lab tests also showed that FHES prolongs the cells' life (Stephanson, Flanagan 2005). No such tests have been conducted on humans or animals yet to assess the effects of FHES.

FHES Decreases the Level of Lactic Acid in Physical Exertion

In a double blind crossover test involving six volunteers Dr. K. Purdy Lloyd's team tested the effects of FHES consumption on physiological processes during physical exertion. The volunteers were males, aged between 20 and 29, non-smokers, healthy and in good physical shape. During the one-week experiment, three of them took four capsules of FHES a day (one in the morning, two at midday and one in the evening), while the remaining three composed the control group and did not take any FHES. Before the beginning of the experiment they all took a test. Each participant had to

ride a bike for 40 kilometres at 'maximum strain.' Experts measured various indicators of physiological processes. At the end of the one-week experiment, all the participants repeated the test. The volunteers who had been taking FHES, each drank two capsules of FHES with a glass of water half an hour before the test. There were no statistically important differences between the two groups in the heart rate, oxygen utilisation and load, but the blood of the participants taking FHES contained significantly less lactic acid. Less lactic acid means less fatigue and a quicker regeneration after exertion. The test did not explain whether FHES diminished the production of lactic acid during strains or prompted its quicker elimination from the organism, but it definitely demonstrated that FHES improved the metabolism of lactic acid (Purdy Lloyd et al. 2001).

FHES Is Completely Safe

Various studies using different methods have been conducted which proved that taking silica hydride is completely safe (Carlise 1982, Purdy-Lloyd et al. 2001, Stephanson, Flanagan 2004a, Hsu et al. 2010). Perhaps the most important study among them was that carried out by Taiwanese scientists under the leadership of Dr. Hsu (2010), in which the effects of the most current form of FHES were tested on mice. The animals were administered very high dosages of FHES mixed into their food – comparable to 24 to 120 capsules a day consumed by an adult human (the manufacturer recommends up to 4 capsules a day), but no negative side effects were detected.

It appears that there is no danger of becoming addictive from FHES either. In the fourteen years I have been using it I never noticed in myself or in others any dependence from this substance.

The reservation that may arise in a critical mind while reading about such a powerful antioxidant as FHES is whether its consumption might 'spoil' the body and cause it to start producing fewer antioxidants of its own. But the test conducted by Taiwanese scientists (Hsu et al. 2010) demonstrated that FHES does not make the protective capacities of the organism grow any less efficient – on the contrary, they strengthened. The activity of the body's own antioxidants SOD, catalase and glutathione peroxidase (very important in the neutralisation of free radicals and reactive oxygen species generated in the electron transport chain) was **increased**.

5. Do Healthy People Need FHES?

Our ancestors lived for millions of years without such water as created with FHES, and people will mostly manage without it in the future, too. But the mentioned experiment performed by Taiwanese scientists with the contemporary form of FHES does indicate that such water is best for the cells of the human organism. This does not seem like the ordinarily potable water that can be obtained in unspoilt nature, nor the kind of water contained in fresh juices, rather a more antioxidative water. It may be surprising for those who advocate that the best comes from pristine nature, but it is in complete accordance with the theory by biologist R. Dawkins (1982) that living beings are not completely adapted to their environment and thus to natural food. FHES can help us optimise some important physiological processes that even the best natural food cannot. Therefore the consumption of FHES is suitable **for anyone who wants to optimise their diets**, for anyone who already follows a healthy and balanced diet, and even for animals (www.physcience.com).

FHES is particularly recommended for people with difficulties in satisfying normal nutritional needs through an ordinary healthy and balanced diet. These are especially **the elderly**. In older age, the digestive capabilities diminish due to natural ageing processes and the body fails to create sufficient colloids. Consequently, the hydration of the cells deteriorates, the danger of the cells clumping together increases, the nutrient provision of cells grows inadequate, and the retention of

metabolic waste in the cells rises. The antioxidant level of blood in the elderly is at least a 100-times lower than in the young and healthy. Older people can correct all these physiological defects by continually supplementing their diets with FHES, while at the same time providing other essential micronutrients in an easily digestible form.

The situation is similar in **enfeebled organisms** (individuals convalescing after illnesses or surgery, people exhausted from psycho-physical exertion). In them, too, the digestion and antioxidant level of bodily fluids are compromised. At least in the period of convalescence it would be highly recommended that they take FHES (while at the same time providing other essential micronutrients in an easily digestible form).

Consumption of FHES is also very beneficial to **professional and recreational athletes**, and anyone living **under greater physical and mental stress**. Major exertion makes the body use more antioxidants (the oxidation in circumstances of pronounced physical and mental strain is greater), requires more micronutrients, as well as a more efficient metabolism of lactic acid and other metabolic waste than can be enabled through an ordinary healthy and balanced diet. We can improve that with FHES (while at the same time providing the food with other essential micronutrients in an easily digestible form).

FHES is thus recommended for groups of healthy people even when they are following healthy and balanced diets. But studies show that less than 3% of the population in the developed countries follow official recommendations on nutrition (Milton 1998). Dietary colloids and antioxidative water can also be obtained by consuming fresh fruit and vegetables and fresh juices made from them, except that according to our surveys, there are less than 3% of people, even among educated population, who eat the recommended five daily portions of fruit and vegetables, and only a minority drinks at least 1.5 litres of water a day. It is therefore no wonder that nowadays such a high percentage of people in the developed countries (75% in the US) are dehydrated.

In circumstances of **insufficiently healthy diets**, FHES can help **anyone** improve their hydration and antioxidant protection. This goes for **children**, too. With such diets, **pregnant women and nursing mothers** are dehydrated and antioxidant-malnourished (the only authority in nutrition counselling during pregnancy and lactation are physicians). More fruit and vegetables and fresh juices is the first rule in improving nutrition for all healthy and fit individuals, however FHES can help, too.

6. FHES Consumption in Times of Illness

FHES is a foodstuff, not a drug, and therefore, like any other dietary supplement it is not intended as a medicine for treating illnesses. As stated before, advice for patients on the use of any dietary supplement is solely the province of doctors. This is especially important to remember when taking prescription drugs. Dietary supplements can in fact alter the absorption of medicines, and this is why I want to stress again that the information herein contained is not intended to provide medical advice, diagnosis or treatment, and not even to persuade consumers into including this type of dietary supplement into their own diets. The entire text is only intended for informational purposes. But in order for the information to be complete, the study of FHES consumption in times of illness should be included as well.

Results of clinical studies on FHES consumption in sick persons are scarce, in addition, they all refer to earlier rather than current forms of this dietary supplement. Studies concerning the consumption of contemporary forms of FHES have only been conducted on animals and do not constitute a sufficient base for counselling (by physicians) on FHES consumption in humans. To

answer the question how taking FHES affects physiological processes in times of illness, further studies would therefore be necessary. Here I would just like to present some of the findings made by scientists and physicians in relation with FHES consumption in times of infection and in degenerative illnesses.

Inflammations and Infections

In the previously mentioned survey involving 126 Slovene users of FHES, fewer colds and flus were stated as two of the three most common positive experiences associated with FHES consumption. Was that just the placebo effect or is there evidence in favour of the hypothesis on improved natural resistance of the organism against infections owing to the consumption of FHES?

An infection is a medical condition caused by harmful microorganisms (bacteria, viruses, fungi etc.) When these multiply excessively inside the human body, their toxins damage the cells and tissues. The organism's response to such damage is the process of inflammation. Inflammation is a protective mechanism employed by the organism to eliminate the consequences of harmful stimuli, such as the activity of pathogens, injuries and irritants (Ferrero-Miliani 2007).

The healing process starts with an inflammatory response. This is a mechanism of innate immunity (Abbas, Lichtman 2009), when the body directs more plasma and leukocytes from the blood into the affected areas. This leads to swelling, redness, elevated temperature and, usually, pain, which lets us know there is something wrong. But this does not happen always. Pain is normally present in acute inflammation; in chronic inflammation, a persistent and long-lasting condition, the pain is frequently slight or even absent. The type of immune cells recruited by the body to the site of chronic inflammation is different from those during acute inflammation. Prolonged inflammation is characterised by simultaneous destruction and healing of the tissue from the inflammatory process. If chronic inflammation is not treated, it leads to decay, degeneration.

Chronic diseases lasting several years also accelerate the process of ageing. One of the very frequently overlooked chronic inflammations is, for example, periodontitis (gum disease) (Poljšak 2012: 49, 50). There can be several silent, mostly painless epicentres like that in the human body. Chronic inflammation where the pain is frequently absent is treacherous and dangerous. "In 2004, in the online edition of *Time* magazine, chronic inflammatory diseases were labelled 'the silent killer,' for they are involved, as a cause or consequence, in most age-related degenerative diseases (cancer, atherosclerosis, Alzheimer's disease)" (Poljšak 2012:50).

Let us take a look at the findings made by studies and physicians about consuming FHES in various types of infection.

Bacterial Infection

The only clinical research of FHES consumption in case of bacterial infection that is known to us was conducted by the dentist Dr. L.C. Miller (1998:13) and it dealt with tooth brushing with FHES powder by subjects with periodontitis. The emergence of periodontitis is associated with calculus, which is mainly composed of pathogenic bacteria that create an oxidised environment and affect teeth and gums. Calculus, or hardened dental plaque, gives rise to periodontitis. By brushing their teeth with FHES powder, the patients of Dr. L. C. Miller's succeeded in diminishing 4-6 mm deep periodontal pockets by half, while also whitening their teeth in the process (Miller 1998:13).

Research shows that pathogenic bacteria develop mainly in oxidised environments with rH values between 13.1 and 42.0 (calculated according to data in Howard, C. H. 1988). To destroy the bacteria, strong oxidants such as disinfectants and antibiotics, which have rH values higher than 42,

are normally used. Some new foodstuffs, on the other hand, have an rH value lower than 13.1, and in such a reductive environment bacteria cannot grow. One of such foodstuffs is also FHES.

Let me illustrate the novelty brought about by FHES to the nutrition of patients with infections with the words of Dr. R. Meyers, who was among the first to study the activity of FHES (in its earliest form, which is no longer manufactured) in his clinical practice: "Unlike antibiotics, which destroy the harmful microorganisms, FHES only creates an environment that makes it difficult for these microorganisms to multiply (…); the unfavourable biological environment s-l-o-w-s them down, thereby enabling the immune system to defeat its attackers the *natural way*.

The fact that FHES does not destroy harmful microorganisms is very important, for with a prolonged use of antibiotics, harmful microorganisms become resistant to antimicrobial agents, adapting to them and developing into genuine 'superorganisms,' immune to any kind of antibiotics. Whereas in an environment that has been added FHES, the DNA and RNA of harmful organisms are not damaged, so these are not forced to restructure and mutate to become immune to the antibiotic. (…) By taking FHES we build and boost our immune system, so that in the future it can fight these aggressors more efficiently by itself" (Meyers 2005:22,23).

Viral Infection

Viruses are parts of the DNA, enveloped in a protein coat. They develop inside the living cells of organisms, moving from them into the environment and replicating in other cells. This only occurs in acidified cells (Alberts, 1994:274-279) - i.e. those with accumulated waste - and not in normal ones, for the liquid in normally vital cells is mildly alkaline (pH 7.1; Ostan et al. 2001:28). For this reason, various detoxification regimes are very effective against viral infections. Fresh juices, fruit and vegetables are also beneficial, for this food is alkaline-producing (Cousens 1993). Drinking FHES-revived water creates a slightly alkaline environment in the organism (Stephanson, Stephanson, Flanagan 2002a), which distinguishes FHES from the majority of ordinary antioxidants available in the market, as these create an acidic or neutral environment (Halliwell, Gutteridge 1985/in: 246-350).

Viruses cause the flu, but also various other diseases: cold sores, some types of warts, AIDS, certain types of cancer, and many others. Dr. R. Meyers described a case of a patient with a severe herpes sore on the lips. He recommended to him an increased dose of FHES. When the patient "returned the next day, his lip was no longer swollen, and the herpetic blister was not causing him any pain. In a week, the crust was gone and under it new skin had grown. (…) An interesting and important side effect was that after eight weeks of taking FHES regularly (…) the patient's genital warts started to reduce, and after four months they disappeared completely." (Meyers 2005:9). The patient had four types of warts scattered all over his body. Some fell off and disappeared, only a few remained unchanged.

Degenerative Diseases

Degenerative diseases are the results of processes based on defective genes – damaged parts of the DNA. They are caused by oxidative stress or free radical activity. Degenerative diseases include atherosclerosis, cardio-vascular diseases, cancer, diabetes, MS, Parkinson's disease, and many others. Nowadays, these conditions are quite frequent. Cardiovascular diseases and cancer were the cause of death in, respectively, 39.5% and 31.5% of total deaths in Slovenia in 2008 (Poljšak 2012).

To understand the importance of FHES (a rich source of active hydrogen) in the nutrition of patients with degenerative diseases it is necessary to remember the role of hydrogen in the defence against free radicals and in the elimination of the damage caused by them. Inside living beings,

electrons are always transported **together with hydrogen**. The damage to the DNA is thus caused by the removal of the hydrogen atom (together with its electron). The antioxidant donates a hydrogen atom to the free radical, neutralising it in the process, while the repair mechanism 'patches up' the damaged part of the DNA by restoring its lost hydrogen atom. The organism's defence against free radicals and capacity for regeneration thus largely depend on the amount of hydrogen in the body.

This also goes for the transfer of electrons in the energy production process. But first, hydrogen needs to be activated for these useful purposes. Even in 1937, Dr. Szent-Györgyi corroborated the belief of his predecessors (Dr. H. Wieland and Dr. O. Warburg) that only 'active hydrogen' can enable the release of the stored energy, which is essential to life processes. This occurs in the body through catalysts – enzymes (dehydratase or dehydrogenase) – which enrich the hydrogen with that additional electron (Szent-Györgyi, 1937:2).

Whether due to degeneration or lack of energy, the organism thus lacks (active) hydrogen. If the available amount is insufficient to cover the daily needs, the organism draws on its own supplies in individual organs. According to Szent-Györgyi, the *liver* is a rich reserve of active hydrogen, followed by the *intestines*, *kidneys*, *heart*, *lungs* and *spleen* (Flanagan, Earthpulse Flashpoints, Newtext No. 1). In short, degenerative diseases are not just about the problem of mutated genes in the cells, but also about *hydrogen undernourishment*, for the body has already exhausted an important share of its reserves in these organs. In such medical conditions or efforts to prevent degeneration we should take care to include lots of active hydrogen in our nutrition. But how much exactly?

The amount of hydrogen, as previously explained, is measured with the rH indicator. According to Dr. Flanagan, a complete protection of the DNA is achieved at rH 12.6 (this information comes from our personal communication). The food with rH 12.6 or lower might prevent or eliminate the active hydrogen undernourishment that accompanies degenerative diseases. Following this logic, FHES, which has an rH of 6 or lower and can be consumed safely even in larger doses, should be very beneficial to the nutrition of patients suffering from degenerative diseases.

Unfortunately, there are no results of clinical studies available to corroborate that. For this reason, I would like to present two cases of FHES consumption in chronic degenerative diseases. Though none of them is intended or serves as evidence of the beneficial effects of taking FHES, they do indicate that it would be sensible to examine more thoroughly this type of nutrition when battling degenerative diseases. In both of the cases described the earliest form of FHES was used.

Chronic degenerative liver disease

For degenerative liver diseases I can give as an example my own case. In 1983, at the age of 31, I was advised by a physician to apply for disability retirement due to a chronic liver condition (caused by a viral infection) and pancreatic disease. In the following years I included in my diet many foodstuffs which, as I now know, are rich sources of anionic hydrogen (fruit, vegetables, fresh-pressed juices). I felt better, but my lab tests showed my liver and pancreas were still affected. In April 1998, I started taking 2 capsules of FHES a day. The results of my liver and pancreas tests slowly showed improvement and after two and a half years of such a diet (in October 2000) they reached normal values. After 23 years of chronic illness, I was cured and have remained healthy since. I have been taking FHES regularly since 1998. It is characteristic of liver patients to tire easily, and decades ago that was the case with me, too. Since I regained my health, however, I can easily manage even day long physical exercise, such as lengthy hikes into mountains and the like.

Table 2: 12-hour rH testing of the current form of FHES mineral powder dissolved in water

Time (constant rotation)	**rH**
5 min	4.3
20 min	1.5
30 min	2.2
60 min	1.2
90 min	1.1
2 hours	**-1.3**
3 hours	**-1.1**
4 hours	**-0.3**
5 hours	0.6
6 hours	0.7
7 hours	4.4
8 hours	16.8
9 hours	21.7
10 hours	27.2
11 hours	25.8
12 hours	26.8

*rH values are calculated applying Dr. Flanagan's formula: rH = (ORP+204)/30 + 2*pH. ORP and pH measurements were conducted by Prof. Dr. Vlado Barbič according to the standard manufacturer's procedure (report dated November 30, 2007). The results refer to the case of an FHES capsule with exceptional reduction properties, for the rH value of a glass of water containing the dissolved FHES capsule (rotated at a speed of 400 revolutions per minute) was even negative for several hours. rH remains at this level for some 4 hours, then the antioxidative property declines (rH rises), but even after 8 hours it still matches the level of the blood of young and fit individuals These results are not in opposition with Dr. Meyer's findings that FHES is the most efficient in the first four hours following its consumption.*

I cannot say for sure that it was FHES that helped me rebuild my health. But there are some indirect proofs that support this thesis. For example, Dr. Ron Meyers successfully used FHES in treating liver problems. He even presented his nutritional protocol for the treatment of hepatitis C before the WHO committee (www.drronmeyers.com, 2005). But the key argument for the theory that nutrition with FHES-type supplements protects the liver and assists its regeneration has recently been provided by a scientific test on animals (Hsu et al. 2010). In a laboratory experiment, scientists damaged the livers of a group of mice with poison to such a degree they were nearly cirrhotic in structure. Another group of mice, which were administered the same kind and dosage of poison and food, were also given FHES in the current form and in very large doses. At the end of the 14-day test, the livers of the mice which had taken FHES were considerably less damaged than those of the mice in the first group.

Degenerative cardiovascular diseases

Indirect evidence that drinking antioxidative water may be beneficial to the heart and the vascular system has been provided by the previously mentioned study conducted by a group of cardiologists, who discovered that the cardiovascular condition of the centenarians from the Hunza

Valley in the Himalayas, which is known for its antioxidative potable water, was exceptional and that it could represent a key factor in their longevity (Murray, Murray 1994).

Dr. Meyers found this to be true with FHES users, too. He described the case of a patient who had suffered a heart attack and underwent an angioplasty due to a dangerous occlusion of coronary arteries. The patient was a zealous runner. After the surgery he recovered and felt well. Without consulting his physician he tried jogging, but the chest pain – angina pectoris – came back after just a few hundred meters. Despite the increased blood flow rate after the surgery, the amount of oxygen supplied through his vessels was apparently still insufficient to allow bigger strains. The day when the patient took the first two capsules of FHES, he was already able to run for 600 meters. He was quite tired by it, but felt no pain. "Three weeks later he was already running over 4 km every day, still without experiencing any chest pain" (Meyers 2005:10, 11). But the most surprising fact was that the patient could run without any problems even several months later, when he had already discontinued the FHES regimen. Dr. Meyers expressed his belief that FHES had permanently improved the throughput of the patient's blood vessels. The reason for this, he believes, may lie in the inhibiting effect of FHES on bacterial growth, which is an important factor in atherosclerotic plaque (Meyers 2005).

And this was not an isolated case. Dr. Meyers noticed that after taking FHES, some of his patients registered a drop in their elevated cholesterol levels. Similar conclusions were reached by the scientists performing the experiments on mice (Hsu et al. 2010). They discovered that FHES "considerably decreased the high levels of (…) triglycerides and cholesterol in the blood (…)" The high levels of these two blood lipids are a risk factor for the development of cardiovascular diseases (AHA 2009). The animal testing involved very large dosages of FHES.

7. FHES Usage

FHES is mostly packed in capsules and sold in plastic bottles containing 60 capsules.

Years ago the recommended daily dose was 1-2 capsules. Our experience shows that even with such dosages the effects of FHES are visible particularly in debilitated and elderly individuals. The manufacturer now recommends taking **2-4 capsules daily**. The results of tests show that the protective function of FHES is more effective with 4 capsules a day than with smaller dosages.

These dosages apply to adults. In **children**, the daily amount should be reduced in proportion to the lower body weight.

Competitive and recreational athletes should take two capsules half an hour prior to the commencement of the sports activity.

Experience shows that it is better for a debilitated person to **start with a smaller daily dose** (1 capsule a day) and gradually increase it. This way they can avoid any initial detoxification crisis (initial general malaise).

FHES is a dietary supplement and not a substitute for a healthy and balanced diet. It does not contain all the necessary minerals, all the vitamins (though the contemporary forms of FHES contain small amounts of vitamin C) and other essential micronutrients. If these substances are missing from the diet, it is sensible to complement the FHES regimen with appropriate dietary supplements that can fill this gap (e.g., cyanobacteria such as spirulina, chlorella, AFA - Aphanizomenon flos-aquae).

When utilizing FHES for **oral hygiene**, part of the capsule's contents can be dissolved in water and the solution used to rinse the mouth or brush the teeth with. A small amount of powder can also be sprinkled onto a wet toothbrush.

Sick people, individuals taking prescription drugs, **pregnant women and nursing mothers** should consult with their physicians before taking any dietary supplements. The following recommendations by Dr. Meyers on the consumption of FHES (referring to its initial form) are thus provided for informational purposes only:

FHES Dosage in Infections

Dr. Meyers says: "I recommend that when you know you are exposed to pathogens causing the flu or a cold you take 2-3 capsules a day for 3-4 days. If you still develop the symptoms, follow the advice in the paragraph below. If you have been exposed to a pathogen causing a dangerous disease (for example, hepatitis), seek medical attention immediately."

"Bacterial and viral infections: Take 2-3 capsules every 4 hours. My patients and I have discovered that this way you can alleviate considerably the symptoms caused by the toxins released by harmful microorganisms, sometimes as soon as within 20 minutes after taking the capsules. (…) I recommend you continue taking FHES for a few more days after the symptoms have disappeared. Patients with symptoms of acute infection normally experience relief in 24-48 hours, but if you take FHES already at the *first* sign of cold or food poisoning, the discomfort passes in 2 hours' time or even sooner" (Meyers 2005:34,35).

In **chronic inflammations**, Dr. Meyers recommends taking 2 capsules three times a day (Meyers 2005:35).

Dr. Meyers does not have any special recommendations for taking FHES when on antibiotics. According to our experience, it is advisable to interrupt the FHES regimen when using antibiotics, as the function of antibiotics is based on a principle (strong oxidation) opposed to that upon which FHES is based (strong reduction) and the effects of antibiotics might be decreased or annulled. It would seem better to wait for the effects of the antibiotics to wear off (a few days following the treatment) and then boost natural immunity with FHES; but this hypothesis still awaits scientific verification.

FHES Dosage in Degenerative Diseases

In case of **degenerative** diseases, Dr. Meyers recommends taking **two capsules of FHES three times a day** (Meyers, 2005:35). "Some patients with respiratory or vascular problems can feel better already 2-10 days after they have started taking (…)" finds Dr. Meyers, and adds: "Sometimes the relief is virtually instantaneous. Many patients suffering from chronic degenerative diseases and observing the same regimen showed improvement after 3-7 days."

We do not possess any results of clinical studies on cancer patients' diets enhanced with FHES. Dr. Meyers recommends taking FHES for various degenerative diseases, including cancer. In his opinion, however, it is safer to discontinue the use of FHES during chemotherapy, since chemotherapeutic active substances are powerful oxidants, while FHES is a strong antioxidant (Meyers 2005).

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