ENERGY

PRODUCT DOCUMENTATION

SPIRULINA BARLEY

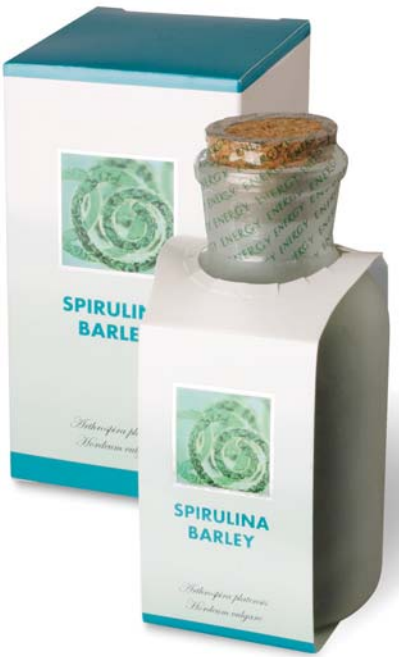
SPIRULIN
BARLE
SPIRULINA
BARLEY

Table of contents

Text of the leaflet

Spirulina Barley is a bioinformation product containing a combination of the Spirulina fresh-water alga and an extract from young barley.
Spirulina is rich in vegetable proteins, beta-carotene, iron, vitamin B_{12}, a rare essential fatty acid GLA, and offers a remarkable scope of vitamins, minerals, and nutrients.
The extract from young barley is obtained from plants carefully harvested at the time of early growth (not exceeding 15cm above the soil), when the plant utilises active substances from the soil and air to the highest degree. It contains a whole range of live enzymes, essential for the proper function of the entire body and its acidobasic balance. It is also rich in vitamins, minerals, and amino-acids in a form which may be easily utilised by the body.

Spirulina Barley influences, in particular, the energy pathways of the stomach, pancreas, and spleen, small and large intestines, liver, gall bladder, heart, pericardium, and of the three energizers.

Spirulina Barley:

- has a positive role in a gentle detoxification of the body;
- supplies necessary minerals, vitamins, and nutrients;
- reduces cholesterol;
- improves intestinal microflora;
- helps to fight obesity;
- has positive effects on diabetes;
- reduces the risk of cancer and other civilisation diseases;
- accelerates the healing of wounds, enhances skin and mucosa regeneration;
- protects the skin from harmful types of radiation;
- acts against inflammations and infections;
- restores acidobasic balance;
- slows down cell aging;
- reduces high blood pressure;
- improves blood count, supports the production of haemoglobin and improves the supply of oxygen in tissues;
- stimulates the organism and improves condition.

Use:

Due to its high nutritional value, **Spirulina Barley** is suitable as an every-day supplement to a healthy diet. It supplies necessary substances to the body and in a unique manner stores its energy in the form of pure glycogen, which the body may immediately transform to greater performance and vitality. It helps to stimulate the body and establishes a condition in which it may optimally utilise its energy system. It is therefore suitable also for weight reduction. Its proven radioprotective effects protect the body from free radicals and various types of harmful radiation (UV, x-rays, etc.). It is a good choice also as a supplement in the treatment of cancer and cardiovascular diseases. It normalises blood sugar levels, has positive effects on the pancreas and it is especially suitable for diabetic patients. It helps to combat anaemia and control blood pressure. Due to its anti-inflammatory effects it may be applied in a number of skin conditions (acne and allergic rash), but also in the treatment of chronic inflammatory conditions of the viscera (liver, heart, lungs, joints, urinary tract, etc.).

Dosage:

2 tablets 1–3 times a day.
After three weeks of application it is recommended to discontinue the product for one week.
Do not exceed the recommended daily dose.
When taking this product it is necessary to ensure an adequate intake of fluids.

Warning:

The product is not intended for children!
Food supplements should not be used as a substitute for a varied diet.
Not intended for persons with chlorophyll and barley hypersensitivity.
Not suitable for persons with phenylketonuria.
Store out of reach of children!
Store at 10–25 °C in a dry and dark place; do not freeze. Store in the original glass container!

Introduction to the topic

Green food

Recently, green food has been gaining more and more popularity, which is not surprising at all, as most of the food that gets onto our tables is, in some way, chemically treated or has been handled in production or processing in a way drastically reducing the contents of nutrients and biologically active substances. Due to acid rains precious mineral substances are washed away from the soil, which then cannot be naturally integrated into the tissues of the crop plants. All heat-processed products, moreover, contain a significantly lower amount of vitamins and minerals which easily succumb to oxidation under higher temperatures, and thus deteriorate in quality. Smoked meat products contain also carcinogenic substances and the wide-spread use of microwave ovens devitalises our food completely.

Our plates then basically hold mere shadows of the original food, which are skilfully treated with “naturally identical”, yet definitely chemical ingredients. These excess chemical substances (additives, preservatives, colourings, flavours) must be processed and excreted by the body, which poses an ever increasing burden on the organism. This unnecessary excess load on the metabolism logically results in a more rapid aging of the organism and a more frequent incidence of diseases.

A return to the original, live food is hence not only a question of a lifestyle, but nowadays also one of the preconditions for long-term good health and condition.

Our organism is constantly exposed to a number of undesirable influences and it is known that the morbidity of the world’s population keeps increasing, despite the ever growing healthcare costs. It is because the human body has much difficulty to cope with the sudden changes of the environment. Man, used to live in a close contact with the nature for thousands of years, has been in the past 100 years (in a fragment of its existence) thrown into an environment full of synthetic chemical substances, polluted air, toxins in food, and stress. It is understandable that life in such conditions poses an excessive burden on the immune system; toxic substances accumulate in the body, and the human organism thus easily succumbs to various (civilisation) diseases. The advice seems to be simple. Return to nature and to natural lifestyle and diet. And this is the very sphere where alternative therapeutic methods availing of purely natural substances which detoxify and regenerate the organism, restore energy and vitality in man come into play. One of the most important groups of natural substances which have the ability to constantly and effectively improve the balance to benefit the human health is the green food proper. The category of green food includes such vegetable products which are prudently obtained from organically grown plants

at the initial stage of their development and are not chemically treated in the course of their processing. Thanks to that, green food which includes algae (such as Chlorella, Spirulina) and young sprouts (e.g. buds, young barley, etc.), offers a naturally high content of vital substances together with the biological information about growth, survival, and return to the original, healthy, natural order.

Guaranteed product quality of Spirulina Barley

This product has been processed in compliance with the tight principles of organic agriculture and complies with the conditions for organic "BIO" labelling. Barley – Hordeum vulgare L. – is grown in mountain fields at high altitudes at clean and remote areas of South-Eastern Asia, without any application of artificial fertilisers, pesticides or gene manipulation. It is harvested within five days of the full moon, by traditional methods which are no longer usual anywhere else in the world. Dried and powdered barley grass retains its typical natural scent, fibre, and high contents of biologically active substances. Spirulina – Arthrospira platensis – comes from a well-known Taiwanese supplier, the biggest exporter to the most demanding Japanese market, and a holder of the ISO 9001 quality management certificate.
To maintain the highest quality, the product is packed in pure natural glass (other materials such as plastics or paper reduce the efficacy of the product by as much as 40% in mere 14 days).

"The organic "BIO" labelling is associated, in particular, with environmentally friendly agriculture, natural animal breeding, and high quality of natural food. People who buy organic food express their responsibility towards their health as well as towards nature, the life of animals, and the balance in the ecosystem." Quoted from the Organic Cookery Book by Hanka Zemanová.

Spirulina Barley composition

Presentation form: tablets
Tablet weight: 500 mg
Content of packaging: 200 tablets

Active substances

Ingredient	Content in a single tablet
Spirulina (Arthrospira platensis)	246 mg
Hordeum vulgare L.	246 mg

Excipients:
Silica, magnesium stearate.

Recommended dosage:

The product may be used any time during the day, ideally with meals. Tablets may be crushed or swallowed whole. It is possible to use them to enrich any usual food whose temperature, however, does not exceed 60°C in order to avoid destruction of substances of high nutritional value.

Recommended daily dose: 2 tablets 1–3 times a day. After three weeks of application it is recommended to discontinue the product for one week. Do not exceed the recommended daily dose. When taking this product it is necessary to ensure an adequate intake of fluids.

Warning:

Not intended for persons with chlorophyll hypersensitivity.
Not suitable for persons with phenylketonuria.
The product is not intended for children.
Food supplements should not be used as a substitute for a varied diet.

Storage method

Store at 10–25°C in a dry and dark place; do not freeze. Store the product in the original glass container in order to maintain the biological quality of the product. The only other alternative is storage in a ceramic container.

Approved by the Ministry of Health of the Czech Republic under ref. no.

OVZ–35.0.–2.11.07

Description of effects of individual components

HORDEUM VULGARE

Domesticated barley (Hordeum vulgare L.) belongs to the Poaceae family and together with other cereal grains represents an important crop plant. Ancient nations grew barley not only for food, but also for brewing beer. In Ancient Egypt, 130 jars of beer were consumed daily at the pharaoh's court. Barley has been much important for ancient Greeks and Romans. Barley porridge was a regular meal at that time, but it also served as an offering to gods. Barley infusions gave strength to gladiators at sports events in arenas. They were also used as artificial nutrition for infants and as a tonic for recovering patients and for the severely ill. Later, due to its more beneficial sensory properties, wheat replaced barley and barley has remained only in the diet of the poorer. In our geographic area barley is the second most common crop after wheat. At present, it is one of the essential foods of the Middle East, but it is also used in Europe and in the U.S.A., particularly in the production of brewer's and distiller's malt. The highest-quality part of the product is used for the production of malt (approx. 30% of spring barleys in the Czech Republic). The latest global research has shown that the application of barley may be much broader than for beer brewing, and has restored the interest in food barley, which is apparent also in the growing assortment of barley food products, as barley nutrition has highly positive effects in the prevention of severe civilisation diseases.

Leach of the green mass of the upper barley leaves (young barley) generally enhances immunity in stress situations, improves immunity to infections and civilisation diseases, and helps to regenerate the organism. Its broadest application is in the treatment of skin, blood, and digestive disorders. It provides energy, maintains vitality, and reinstates good humour.

AMINO-ACIDS – Compared to crop grain, the powdered young barley grass contains double the amount of proteins (exceptionally as much as 45% of the entire weight). This includes, in particular, amino-acids and vegetable peptides of low molecular weight and may be easily utilised by the human body. Vegetable peptides protect the surface tissues and mucosa from damage and help in their regeneration. Amino-acids are the main building blocks of proteins which form any cell in the human body, and hence they are indispensable for healthy cell growth, regeneration, and in general, for the maintenance of any vital functions. Young barley contains 18 (out of 20) amino-acids, incl. essential amino-acids which cannot be produced by the body itself.

VITAMINS AND MINERALS – Young barley contains a wide range of vitamins and minerals bound in a natural and well-absorbable form. Although their total amount in the regular daily dose of Barley does not cover the daily vitamin and mineral intake, their

Description of effects of individual components

efficacy is synergically increased by the balanced composition and presence in the biological complex with polysaccharides and bioflavonoids. Vitamins and mineral are, moreover, important also for the activation of the present enzymes. Young barley is especially valued for its high content of beta-carotene, provitamin A, which acts as a powerful antioxidant and protects the body against harmful effects of free radicals and sunrays externally as well as internally. It is, furthermore, a rich source of vitamins of the B group and vitamin C which help to restore physical as well as mental power.

CHLOROPHYLL – Studies show the effect of the green photosynthetic pigment chlorophyll in the stimulation of tissue growth, blood and red blood cell production and in the overall improvement of the blood count. Chlorophyll enhances the production of haemoglobin (red blood pigment, which is much similar to chlorophyll in its structure), and thus helps to increase the efficacy of tissue oxidization. Chlorophyll, in particular, significantly accelerates the healing of wounds and burns (it stimulates the granulation and epithelisation processes) and prevents the onset of inflammations and infections (it has bacteriostatic effects – it prevents the growth of undesirable micro-organisms). It has provable antiseptic, detoxifying, and deodorant effects (it suppresses body smells). It has been shown in a number of clinical case studies that the healing effects of chlorophyll may be successfully used in the treatment of chronic purulent skin traumas, lesions, and ulcers accompanied by necrotic processes, which are resistant to conservative treatment. Chlorophyll neutralises the effects of free radicals, fights premature aging of the body, and stimulates the immune system. At present, much attention is given to its anti-radiation properties (protection from various types of radiation), and chemo-protective properties (protection from the effects of a number of potentially harmful chemical substances), due to which chlorophyll has an important role in the prevention of cancer. Chlorophyll is also a valued source of biologically bound magnesium, a mineral essential for the proper function of the heart, muscles, and the nervous system.

ANTIOXIDANTS – Substances with provable antioxidative effects (see below) have been isolated from young barley, which may contribute to the prevention of cancer and other civilisation diseases (cardiovascular diseases, diabetes, obesity, metabolic disorders). The presence of antioxidants provably reduces the risk of succumbing to a viral infection.

ENZYMES – Young barley contains a number of biologically active enzymes which are the catalysts of almost all metabolic processes within the body. As early as in 1979 it has been experimentally evidenced that green barley extract contains more than 20

enzymes, and the latest studies have discovered yet other ones. Most of the commercially available enzymatic products intended for systemic enzyme therapy are obtained from blood, organs or tissues of animals (porcine pancreas and ox gall bladders). Many experts express their doubts concerning these sources and definitely prefer a purely "vegetable" enzyme therapy.

Young barley – a natural source of enzymes

The importance of enzymes in food

The presence of enzymes in everyday diet is absolutely essential for human health. If the body gets only biologically "dead", chemically and heat treated food, it is exhausted by the necessary production of enzymes which, under normal circumstances, would be received in an already synthesised form together with untreated "live" vegetable food. Food without live enzymes results – sooner of later – in the overload of the digestive tract and of glands producing digestive enzymes, in digestive disorders (the sensation of excessively full abdomen, flatulence, belching, constipation or diarrhoea), and later also in the onset of civilisation diseases. There are no doubts about the association between higher incidence of civilisation diseases and the intake of generic food, yet inadequate attention is paid to this issue even in healthcare facilities. The importance of the presence of active enzymes in food, and, subsequently also the system of enzyme therapy, is hence no new modern medical method, but rather an effort to return people to natural lifestyle from which we have, paradoxically, diverted with our modern diet.

The major function of enzymes in the body is to participate in any process going on in a cell and to ensure the digestion of nutrients received in food. Digestive enzymes break down individual components of the food (amylases split sugars, lipases split fats, and proteases break down proteins) to more simple components which are then used as building blocks for the body or as a source of energy. Generally, it may be said that any raw natural food contains a complete suite of enzymes which are necessary for its break-down to individual components. Food processed by heating in excess of 45°C does not contain any live enzymes as during cooking they have been irreversibly denaturalised. When chewing raw food, the cellular structure is disintegrated and the food is mixed with the present enzymes. The break-down of nutrients in live food thus begins as early as in the mouth, when the food is mechanically processed, or even on the plate, if properly treated (fermented food). The process then continues in the digestive tract where enzymes produced by the body come into the process. This is the process employed for the digestion of food in all animals and - for thousands of years also in man, until people began to process food by heat, thus

Description of effects of individual components

reducing the natural content of enzymes.
In order to digest heat processed food, the body itself must produce all the necessary enzymes. Unlike in digesting live raw food with its own contents of digestive enzymes, the body must produce a significantly higher amount of digestive enzymes. Simply speaking, the body again synthesises the enzymes that have been destroyed in pots and pans during cooking, which means that it has to provide not only a lot of energy to produce the enzymes, but also the individual building blocks (amino-acids, vitamins and minerals) necessary for the enzyme synthesis. Due to this process we actually unnecessarily deprive ourselves of these substances and, at the same time, overload all glands involved in enzyme production. People indeed have a much higher level of digestive enzymes in the digestive juices than wild animals. Furthermore, it has been found out that the pancreas of people (but also of animals) who consume heat processed food without the content of enzymes is several times bigger than it should be. Pancreas, moreover, gets naturally weaker in the course of life, and its performance in the older age decreases significantly.
It is necessary to take into account that if the body is forced to give too much energy to the production of digestive enzymes, it is definitely to the detriment of other enzymes, whose levels drop over time. The overproduction of digestive enzymes may hence have its role in the overall destabilisation of the chemical metabolism of the body. The negative effect of the overload of the organism due to the excess production of digestive enzymes cannot be seen immediately – problems usually arise with increasing age, or in accumulated load (inadequate diet + stress + increasing pollution). This results in a premature exhaustion of the organism, fatigue, obesity, high susceptibility to infections as well as civilisation diseases, and general shabbiness.
Scientists agree that man is born with a certain supply of enzymes which is gradually used up in the course of life. Without enzymes, all vital functions are impaired – digestion, breathing, movement, and that is why it is important for us to maintain a high level of enzymes even in the older age. The utilisation of the enzymatic supply may be slowed down by avoiding the food and lifestyle which is more enzyme-demanding, and by eating food which is rich in enzymes.

Important enzymes present in young barley

- Young barley contains a natural combination of more than 20 various enzymes present in a synergic complex with substances necessary for their activation.
- **Superoxide dismutase (SOD)** – an inane body enzyme occurring naturally outside as well as inside cells is part of the endogenous system whose function is to reduce oxidative stress in the cell. SOD is a highly important antioxidant enzyme and protects

cells from attack of free oxygen radicals; it is involved in protection against infections and prevents DNA damage and tumour diseases. SOD is a catalyst of the transformation of the superoxide radical to oxygen and hydrogen peroxide: $2O_{2\cdot} + 2H^{+} \rightarrow H_2O_2 + O_2$.

- The chemical structure of SOD always includes a cofactor in the form of a metal cation (Cu^{2+}, Zn^{2+}, Fe^{2+}, Ni^{2+}, Mn^{2+}), which ensures SOD activity. For the proper work of the antioxidative system it is therefore necessary to provide a supply of the above mentioned ions. The benefit of Spirulina Barley is the presence of both SOD and the minerals necessary for its activation. Aging and inflammatory processes are directly associated with the dropping activity of SOD. The reduced activity of SOD is also one of the accompanying phenomena observed in a number of tumour diseases.
- **Catalase** – an inane body enzyme which cooperates with SOD and immediately breaks down the hydrogen peroxide produced thereby to water and oxygen: $2H_2O_2 \rightarrow 2H_2O + O_2$.

Catalase is an enzyme which, in comparison with others, is by far the most active one. Hydrogen peroxide is a molecule which is normally produced in a number of metabolic processes, yet is dangerous for the body, as it increases the acidity of the inner environment, increases oxidative stress and has carcinogenic effects, and therefore it is necessary to convert it to substances which are not harmful for the body once it is produced.

- **Haemoprotein** – an enzyme which disposes of very strong carcinogenic and mutagenic substances (Try P1 and Try P2), which are produced in roasted or burnt meat.
- **Glutathione peroxidase (GSHPx)** – it works in the same way as catalase; it breaks down toxic hydrogen peroxide to water and oxygen. Its activation requires the presence of selenium.
- **Cytochrome c oxidase** – is part of the mitochondrial electron transport chain (also respiratory chain), the metabolic system which is involved in the conversion of energy within cells. It is involved in the final oxidation of nutrients and their transformation to energy (or production of ATP). By electron translocation it causes molecular oxide to change to water. This system is responsible for 90% of the total oxygen consumption in the body. Any malfunction causes severe and, much likely, fatal diseases associated with brain and heart damage.
- **Transhydrogenase** – another enzyme of the respiratory chain involved in the transfer of energy.

Enzymes for the healing process

Enzymes (or entire enzymatic systems, where the activity of an enzyme follows up on the activity of another one) help to maintain the balance of the human body. During increased load (such as the burden of foreign substances, a trauma, excess load or stress) the demand for enzymatic activity in the body increases as well. If the body is well balanced, it

Description of effects of individual components

is much more capable to offset the swings of the outer as well as inner environment, to adapt to the current load, and is less likely to succumb to a disease. Enzymes play a major role in all inflammatory processes, they enhance the general immune function of the body, ensure good blood circulation, adequate blood density, help in wound healing, and are able to destroy cells which have got out of control. An imbalance in enzymatic systems is associated with all chronic diseases, and it therefore seems much useful to take enzymes prophylactically.
The interest of medical professionals as well as that of the general public in enzyme therapy keeps growing and its results are very promising and proven by years of practice. Over the fifty years of its application in medicine, however, enzyme therapy has unfortunately failed to gain greater publicity, perhaps due to the prejudice given by our ignorance of its exact mechanism of action. Therapeutic application of enzymes, however, is no latest hit; it is, on the contrary, as old as mankind. Therapeutic procedures availing of the activity of enzymes are described even in the Bible (application of dried-fig dressings), they have been evidenced in the Mayas and other natural nations (application of pineapple or papaya pulp and juice). A therapy employing enzymes has been much often successfully used in the treatment of tumour diseases.
The use of raw, untreated food together with natural enzymatic products is hence one of the options how to effectively care for one's health in the long term and how to prevent infectious diseases, civilisation diseases or swings in the inner balance of the body. The biggest benefit of Spirulina Barley is the presence of a number of natural substances in a synergic complex.

Young barley and acidobasic balance
Young barley has a major alkalising effect in the human body (it decreases the acidity of the inner environment). Most of the food we currently eat induces an acid reaction in the human organism, and the excessively acid environment in the body is a good substrate for a number of diseases and microbes. Our cells are not able to work correctly, unless the inner pH value is within the fairly narrow range of neutral values. Young barley contains basic minerals, such as sodium, potassium, calcium, and magnesium, which due to their alkaline nature help to neutralise the acidic environment in the body, thus assisting in body function optimisation. The ability of young barley to reduce acidity of the inner environment may be also practically used in problems with excess acidity of the stomach, non-specific abdominal pain, and heartburn. Thanks to the alkalinisation of the inner environment barley acts as prevention of gastric and duodenal ulcers and assists in their treatment.
The preventive reduction of inner environment acidity is important in the prevention of infectious and tumour diseases.

Young barley and antioxidants
Physiologically, there is an anti-oxidation protective system within the body. The scope of body damage hence depends on the balance of oxygen radicals and the ability of the anti-oxidation protective system to uptake and stabilise the oxygen radicals. The anti-oxidation protective system is formed by specific enzymes as well as by non-enzymatic substances. Young barley contains a number of substances which are part of this system. When consuming Barley, the immune mechanisms inherent to the body are enhanced.

- Antioxidant enzymes – superoxide dismutase (SOD), glutathione peroxidase (GSHPx), catalase.
- Non-enzymatic antioxidants

– vitamin E, vitamin C, beta-carotene, chlorophyll, trace elements (selenium and zinc), 2”-O-glycosylisovitexin (GIV) – these act against damage to the lipid structures of the skin caused by UV radiation.
The support of the anti-oxidation protective system results in slower aging of the organism, reduced risk of cardiovascular diseases and of cancer. The consumption of young barley is beneficial in particular nowadays, when man is exposed to major pollution which is the source of a large scope of free radicals.

Young barley and cancer
It has been evidenced that young barley inhibits the growth of cancer cells, which is likely to be caused by the combined effects of inner environment pH normalisation, strong anti-oxidative action, the presence of active enzymes and chlorophyll. The effects have been reported especially in prostatic cancer. Due to the general purifying effects on the digestive tract preventive anti-tumour action may be anticipated in intestinal and rectal cancers. Laboratory tests have shown that young barley is effective also in the destruction of leukaemia cells and significantly suppresses the development of brain tumour cells.

Young barley and skin
The use of young barley helps to regenerate the skin and mucosa, it enhances healing and the growth of new skin cells and has anti-inflammatory effects. It may be used internally as well as externally to slow down skin aging and as a supplement in the treatment of ulcers, inflammatory skin diseases, eczema, and allergic skin rash. Its radioprotective effects due to a high content of chlorophyll and beta-carotene are known. It protects the body surface from harmful effects of excess tanning as well as from other types of negative radiation. It is used as a supplement in radiotherapy. Its long-term usage visibly improves acne and prevents the formation of cold sores and aphthae.

Young barley and the digestive tract
The high content of fibre (30%) in young barley has positive effects on proper peristaltic activity of the

Description of effects of individual components

intestines and is one of the products effectively and safely helping to combat constipation as well as diarrhoea. It works well against flatulence and generally suppresses body smells due to its high content of chlorophyll. Its anti-inflammatory effects may be availed of in the treatment of chronic inflammatory diseases of the intestines.
It may help to combat obesity as it supports defecation and improves metabolism.

Young barley and diabetes
In diabetic patients or patients with significantly or totally impaired endocrine function of the pancreas taking young barley, a long-term stabilisation of blood sugar levels (glycaemia), and hence prevention of hyperglycaemic or hypoglycaemic events may be anticipated. It may also prevent or delay the onset of complications (such as vascular problems), which accompany advanced-stage diabetes.

Young barley and blood
Substances present in young barley inhibit the formation of blood clots by platelet clustering, enhancing better blood viscosity and flow. They prevent thrombosis and cardiovascular diseases. Young barley also enhances the production of red blood cells and may be applied as a supplement in the treatment of anaemia. It provably decreases LDL cholesterol blood levels (increasing HDL cholesterol levels). Due to the high content of chlorophyll it uptakes harmful substances from blood, which results not only in a general increase of energy, but also e.g. in a reversal of skin problems and systemic allergic symptoms.

Young barley and inflammatory diseases
It has been evidenced that long-term use of young barley (for the minimum of three months) has a major role in reducing inflammatory processes in the body. Laboratory results have shown that in the course of usage inflammatory markers in blood (CRP – C-reactive protein – the major indicator of inflammatory processes in the body) drop in the course of chronic inflammatory conditions. For its anti-inflammatory effects, young barley may be used as a supplement in the treatment of gynaecologic and urologic problems (urinary tract, prostatism), airway infections, and inflammatory diseases attacking the joints (rheumatism, arthritis). During fever and at the onset of an inflammatory condition, young barley may be used to enhance enzymatic activity, the immune function of the body, and hence shorten the duration of the disease.

Young barley and sport
The effects of young barley may be used to enhance condition and endurance in active sportsmen, who are constantly exposed to high physical and mental stress. It ensures the supply of all important minerals, vitamins, and building blocks for the formation of

muscle mass in the body. It preventively protects muscle cells from damage by free radicals which are inevitably produced during exacting aerobe training. It improves muscular activity (supports blood circulation) and is involved in the catabolism of metabolic products (e.g. lactic acid), preventing muscular spasms, oedema, and traumas. It does not contain any preservatives which unduly burden the organism. It speeds up tissue regeneration after exhausting performance and generally improves immunity, endurance, and vitality.

ARTHROSPIRA PLATENSIS

Spirulina (Arthrospira platensis) is a fresh-water alga. It is one of the 1,500 known species of blue-green algae growing in brackish ponds or lakes in the mild and warm climatic zones all over the world.

Proteins

For centuries, Spirulina has been used as the richest source of nutrition. Two thirds of its weight is formed by pure proteins, 100g of Spirulina contains 50–60g of protein, which is three times more than in soy beans. Spirulina proteins are extremely easily absorbed in the human body. The absorption coefficient is as much as 65–80%. For example the soy bean protein is only absorbed in 40%.
For this reason, experts consider this alga a low-calorie bomb suitable for individuals with increased working rate and high mental involvement. Globally, it might in future help to resolve the issue of famine in the affected areas of the world, in particular in Africa.

Amino-acids

Spirulina contains 18 types of amino-acids which are essential for man, of which 8 types cannot be produced by the human body itself (alanine, arginine, aspartic acid, cysteine, glutamic acid, glycine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, proline, serine, threonine, tryptophan, tyrosine, and valine).

Description of effects of individual components

Vitamins
Spirulina is rich in beta-carotene (100g of Spirulina contains 50mg of beta-carotene and 2g of Spirulina supply more than 100% of the RDD of vitamin A), vitamins of the B group, incl. vitamin B_{12} (contains twice as much vitamin B_{12} than liver), vitamins D, E, and K.

Minerals and trace elements
Spirulina contains a number of essential minerals and trace elements, incl. iron (10 g of Spirulina contains as much iron as 450g of sorrel or 320g of liver), calcium, sodium, potassium, copper, magnesium, manganese, zinc, phosphor, chrome, iodine, selenium, and cobalt.

Others
Last but not least Spirulina contains the important gamma-linolenic acid, enzymes, chlorophyll, phycocyanin and xantophyll pigments, a large amount of ferrodoxins, and cellular salt.

In its content of nutrients, 1g of Spirulina is equal to 1kg of good-quality vegetables.

Spirulina and diabetes
Spirulina is rich in V-linolenic acid. This substance assists in the production of prostaglandin, and hence may regulate blood pressure, help cell proliferation, prevent and treat inflammatory processes of various types, heart and pancreas diseases. In a scientific lecture, Japanese scientists have stated that the sugar levels in patients with severe diabetes taking Spirulina for 8 weeks have dropped to the levels of patients with mild diabetes. This lecture has, moreover, emphasised that many people in Japan take Spirulina, 45% of them for various therapeutic purposes, and 25% to treat diabetes. Clinical observations confirm that if Spirulina is used for the treatment of diabetes, very good effects may be achieved. Although Spirulina cannot replace insulin in the treatment of diabetes, it may suitably complement medical treatment.

Spirulina as an ideal source of energy
Spirulina in a unique way stores its energy in the form of pure glycogen, which may be immediately utilised by the body in the form of higher performance and vitality. It helps to stimulate the organism and induces a condition in which the body may optimally utilise its energy system and perform optimally.

Spirulina and allergies
A study in 270 children has shown that daily consumption of approx. 5g of Spirulina tablets normalises IgE within six weeks. In children who have not taken Spirulina, the IgE levels have not changed. No adverse effects have been reported. Spirulina decreases the IgE blood levels, which results in the normalisation and reduction of allergies (a study

conducted by the Grodensk Medical Institute, Russian Federation).

Spirulina and anaemia

In eight women, hypochromic anaemia has been evidenced - a lower amount of haemoglobin in blood than usual. After each meal, four grams of Spirulina have been administered to these women. After thirty days, the haemoglobin blood level has increased by 21%, i.e. from 10.9 to 13.2, which is an acceptable level no longer considered anaemic. Spirulina contains a highly available form of iron. Iron obtained from a plant, which has high availability, is difficult to find. It has been discovered that the absorption of iron in rats and in man are closely linked. Rats fed with Spirulina have absorbed as much or more iron as the rats fed with the Iron Sulphate dietary supplement. As a comparison, when absorbing iron from potatoes and wholegrain bread, about 50% less of iron sulphate is obtained. Spirulina seems to be a sufficiently concentrated source of available iron (Clinical experiences of administration of Spirulina to patients with hypochronic anemia T. Takeuchi et al. 1978. Tokyo Medical and Dental University, Japan 1978).

Spirulina and cholesterol

In thirty healthy men with high cholesterol levels, mild hypertension, and hyperlipidemia (increased concentration of fats in blood) have been reported lower serum cholesterol, triglycerides and LDL (unwanted fat) levels after the men have been administered Spirulina for the period of eight weeks. These men have not changed their eating habits – they only added Spirulina. No adverse reactions have been reported in them. Group A has been receiving 4.2g daily for weight weeks. The total serum cholesterol has, in four weeks, significantly dropped by 4.5%, from 244 to 233. Group B has been receiving Spirulina for four weeks, after which Spirulina has been discontinued. Researchers have concluded that Spirulina has reduced serum cholesterol levels and that it is likely to have positive effects in alleviating heart diseases, as the atherosclerosis index has improved. (A study titled Cholesterol lowering effect of Spirulina, N. Nayaka et al., published by Tokyo University in Nutrition Reports, Japan 1988)

Spirulina and radioprotective effects

Spirulina is able to decrease radioactivity levels in urine by as much as 50% in mere twenty days. This result has been achieved by the administration of a 5g daily dose to children at the Minsk Radiology Institute (Belorussia). The Institute has developed a programme for the treatment of one hundred children every twenty days. This report from 1993 confirms a research conducted in 1990-1991, focused upon the benefits of Spirulina for children suffering from irradiation diseases. It is concluded as follows: “The use of Spirulina decreases the

Description of effects of individual components

radiation burden dose caused by food contaminated with radionuclides, Cesium-137 and Stroncium-90. Spirulina has a positive effect on the normalisation of the adaptive potential of the child's organism in low radiation doses with long-term effects."
The radioprotective effect of Spirulina has been investigated also by means of micronucleic test in the bone-marrow polychromatic erythrocytes of mice. The extract has caused an apparent reduction in the micronucleic frequency induced by gamma rays.

Basic nutritional values of the Spirulina Barley product

Proteins	41,3 %
Mono- and oligosaccharides	13 %
Polysaccharides (starches)	7 %
Fibre	17 %
Chlorophyll	430 mg/100 g

Vitamins contained in the Spirulina Barley product

Abbreviation	Name	Main effects	Approx. amounts in 100g of Spirulina Barley
β-carotene	Provitamin A	Antioxidant, skin and mucosa protection, cancer prevention	309 mg
B_2	Riboflavin	Involved in sugar metabolism, helps to burn sugars	3,1 mg
B_3	Niacin	Proper brain function, disposal of fats and cholesterol	11 mg
C	Ascorbic acid	Against infections and fatigue, necessary for the synthesis of collagen	190 mg
E	Tocopherol	Antioxidant, enhances tissue regeneration and healing, cancer prevention, improves immunity	13 mg
B_5	Panthothenic acid	Anti-allergic effects, enhances immunity and hair growth	9 mg
B_1	Thiamine	Helps to combat fatigue; good condition of nerves and mental health	3,4 mg
B_6	Pyridoxine	Part of enzymes, enhances immunity and the functions of the nervous system, involved in fat metabolism	21 mg
B_9	Folic acid	Part of enzymes; nervous system functions, enhances growth and development	0,5 mg
B_{12}	Cobalamine	Against fatigue and anaemia; nervous system functions	2,2 mg
H	Biotin	Good skin condition, proper development of the organism	0,3 mg

Description of effects of individual components

Mineral substances contained in the Spirulina Barley product

Chemical formula	Name	Main effects	Approx. amount in 100g of Spirulina Barley
K	Potassium	Transfer of impulses in muscles and nerves, regulation of cardiac and renal function	3 g
Ca	Calcium	Prevention of osteoporosis, anti-allergic effects, nervous impulse conduct, enzymatic processes	320 mg
Mg	Magnesium	Against attacks and spasms, part of enzymes	14 mg
Fe	Iron	Against anaemia, enhances the metabolism of proteins	134 mg
I	Iodine	Enhances thyroid gland function	77 µg
Se	Selenium	Antioxidative and anticancer effects	8 µg
Zn	Zinc	Part of enzymes, supports the immune system	5 mg
Cr	Chromium	Part of enzymes	3,3 µg
Mn	Manganese	Enzymatic activator	43 mg
P	Phosphor	Inherent part of nucleic acids	210 mg
Cu	Copper	Activates enzymes involved in the metabolism of saccharides, bone mass production, haematopoiesis and nervous system function.	5 mg

Amino-acids contained in the Spirulina Barley product

Name of the amino-acid	Remark	Content in Spirulina Barley
Glutamic acid	Involved in brain processes	2,5 %
Aspartic acid	Enhances endurance and energy	2,5 %
Alanine	Part of connective tissue, involved in the metabolism of glucose	3,1 %
Leucine ♥	Alleviates pain, accelerates healing	3,5 %
Lysine ♥	Against cold sores, viruses, stimulates the production of collagen	3,2 %
Arginin	Enhances muscle growth, immunity, production of sperm	1,1 %
Valine ♥	Neurotransmitter function	1,1 %
Glycine	Sedating effects, synthesis of other amino-acids	0,5 %
Phenylalanine ♥	Against fatigue and depression, against pain, enhances the production of collagen	1,1 %
Threonine ♥	Enhances the immune system, production of collagen	0,4 %
Proline	Major constituent of collagen	0,5 %
Serine	Enhances memory and nervous function, important for the production of antibodies	1,2 %
Tyrosine	A staring material for the production of neurotransmitters and hormones of the thyroid gland	0,5 %
Isoleucine ♥	Protects muscles from catabolism	1 %
Methionine ♥	Disposes of heavy metals	0,7 %
Tryptophan ♥	Peaceful sleep, mental health – starting material for the production of serotonin	0,3 %
Histidine ♥	Essential in childhood	0,1 %
Cysteine	Disposes of heavy metals, protects from toxins, enhances hair growth	0,2 %

♥ … essential amino-acids which cannot be produced by the human body itself

Description of effects of individual components

Fatty acids contained in the Spirulina Barley products

Name of the fatty acid	Approx. amount in 100g of Spirulina Barley
Dihomo-gamma-linolenic acid	0,23
Gamma-linolenic acid	5 mg

Amount of SOD in Spirulina Barley

Superoxide dismutase (SOD)	678 U

CHIEF HEAD-OFFICE AND HEAD-OFFICE
FOR THE CZECH REPUBLIC
ENERGY GROUP, a. s.
Trojská 201/39, 171 00 Praha 7
Czech Republic
tel. / fax: +420 283 853 853/54
info@energy.cz, www.energy.cz