

## **ENERGYbits® (Spirulina) Nutritional Analysis**

### **Proteins:**

ENERGYbits® are 100% NON GMO, organically grown blue-green algae called Spirulina. Spirulina has a “primitive” structure that has few starch storage cells and cell membrane proliferation, but is rich amounts of ribosomes, the cellular bodies that manufacture protein. This particular arrangement of cellular components allows for rapid photosynthesis and formation of proteins. The lack of hard cellular walls assures that Spirulina protein is rapidly and easily assimilated by consuming organisms.

ENERGYbits® spirulina algae tabs are 65 percent protein. These proteins are biologically complete, which means they provide all eight essential amino acids in the proper ratios. Furthermore, spirulina provides all the required amino acids in a form that is easier to digest than meat or soy protein.

### **The eight essential amino acids found in ENERGYbits® Spirulina:**

- **ISOLEUCINE:** Required for optimal growth, intelligence development and nitrogen equilibrium in the body Used to synthesize other non-essential amino acids.
- **LEUCINE:** Stimulator of brain function, increases muscular energy levels.
- **LYSINE:** Building block of blood antibodies, strengthens circulatory system and maintains normal growth of cells.
- **METHIONINE:** Vital lipotropic (fat and lipid metabolizing) amino acid that maintains liver health. An anti-stress factor, it calms the nerves.
- **PHENYLALANINE :** Required by the thyroid gland *for* production of thyroxine which stimulates metabolic rate.
- **THREONINE:** Improves intestinal competence and digestive assimilation.
- **TRYPTOPHANE:** Increases utilization of B vitamins,improves nerve health and stability of the emotions. Promotes sense of *calm*.
- **VALINE):** *Stimulates mental capacity and muscle coordination.*

### **The non-essential amino acids supplied by ENERGYbits® Spirulina:**

*Our Spirulina supplies ten of the twelve non-essential amino acids. "Non-essential" does not mean that these amino acids are not needed by the body, but merely indicates that the body can synthesize them itself if it needs to do so, provided the appropriate nutritional building blocks are available. Nevertheless, the body is better served if these excellent protein components are readily and totally available from dietary sources like ENERGYbits® since all the amino acids must be on hand as the cells manufacture enzymes, proteins, hormones, brain chemicals and the other products of metabolism. Of the thousands of biochemical substances acting and interacting in the human body, not one is derived from a vacuum; the body is ultimately dependent upon nutrient intake for all of its functions.*

- **ALANINE:** *Strengthens cellular walls.*

- *ARGININE: Important to male sexual health as seminal fluid is 80 percent arginine. Also helps detoxify the blood.*
- *ASPARTIC ACID: Aids transformation of carbohydrates into cellular energy.*
- *CYSTINE: Aids pancreatic health, which stabilizes blood sugar and carbohydrate metabolism. Has been used to alleviate some symptoms of food allergy and intolerance. >*
- *GLUTAMIC ACID: With glucose, one of the principal fuels for the brain cells. Has been used to reduce the craving for alcohol and stabilize mental health.*
- *GLYCINE: Promotes energy and oxygen use in the cells.*
- *HISTIDINE: Strengthens nerve relays, especially in the auditory organs. Has been used to reverse some cases of deafness.*
- *PROLINE: A precursor of glutamic acid.*
- *SERINE: Helps form the protective fatty sheaths surrounding nerve fibers.*
- *TYROSINE: Slows aging of cells and suppresses hunger centers in the hypothalamus. Can be synthesized from phenylalanine. Involved in proper coloration of hair and skin, including protection from sunburn.*

## Minerals:

*Although proteins are the building blocks of life, many trace minerals can profoundly effect health and metabolism. Our Spirulina is grown in alkaline waters which helps it to incorporate and synthesize many minerals and derivative compounds into its cell structure. Once transformed into natural organic forms by the Spirulina, these minerals become chelated (bound to) to amino acids and are therefore more easily assimilated by the body. There are many forms of disease that are due to mineral deficiency. ENERGYbits spirulina algae contains all the essential minerals and trace elements and all are absorbed easily:*

- *POTASSIUM : A crucial mineral that regulates body electrolyte balance. Deficiency can cause heart arrest, hypertension, adrenal exhaustion and muscular collapse.*
- *CALCIUM : The most abundant mineral in the body, it is especially important to bone and dental health, but is also involved in neural transmissions to the muscles. Spirulina supplies about as much calcium, gram for gram, as milk.*
- *ZINC : The pivot point of over thirty vital enzymatic reactions, with profound effects on mental health, skin tone, prostate function and healing capacity.*
- *MAGNESIUM : Deficiency can lead to spasmodic muscle disorders, including cardiac irregularities. Helps assimilation of vitamin C, B vitamins and protein.*
- *MANGANESE : Activates enzyme systems, along with zinc. Promotes activity of neurotransmitter acetylcholine, and helps stabilize blood sugar.*
- *SELENIUM : Originally believed to be a toxic heavy metal, but now known to be necessary for health. It retards aging, harmful oxidation and free radical formation, reduces the toxic effect of carcinogens, and improves cardiac efficiency.*
- *IRON : Promotes formation of hemoglobin, the oxygen-carrying blood pigment found in healthy red blood cells. Iron deficiency is most common among women in their reproductive years.*
- *PHOSPHORUS : The second most abundant mineral in the human body, it is found in practically every cell. Functions with calcium to maintain bone density. Helps to digest carbohydrates and the B vitamins niacin and riboflavin.*

## Vitamins:

*ENERGYbits® spirulina supplies several of the vitamins that all living beings need to carry on metabolic processes:*

- *PYRIDOXINE or B6 : Involved in breakdown and assimilation of protein. Protects cardiac health, reduces edema and stabilizes female hormone levels. Dr. Carl Pfeiffer has demonstrated that B6, together with the mineral zinc, can cure some forms of schizophrenia.*
- *BIOTIN : An enzyme that carries CO, during certain biochemical reactions involved in carbohydrate metabolism. Also acts as a co-enzyme in the assimilation of other B-complex vitamins. Biotin is destroyed by eating raw egg whites and some kinds of raw fish.*
- *COBALAMIN or B12 : The most difficult of all vitamins to obtain from vegetable sources. Spirulina is extremely rich in this rare vitamin, containing 250 percent more than beef liver, previously thought to be nature's richest source. A single serving of Spirulina easily exceeds the Recommended Daily Allowance of 1.5 to 3 mcg daily. A B12 deficiency results in pernicious anemia, nerve degeneration, premature senility, pronounced fatigue and mental illnesses resembling schizophrenia.*
- *PANTOTHENIC ACID : The "stress" vitamin, used by the adrenal glands, along with cholesterol and vitamin C, to manufacture cortisone and other steroids in response to physical and mental stress. Deficiency encourages sensitivity to allergy, infection and degenerative diseases such as arthritis and rheumatism. Ulcers and hypoglycemia have also been associated with shortage of this vitamin.*
- *FOLIC ACID : Essential to proper hemoglobin formation in red blood cells. Deficiency results in anemia, poor growth, skin pigmentation disorders and premature graying of the hair.*
- *INOSITOL: Vital lipotropic nutrient that sustains liver health and helps detoxify carcinogens, particularly excess female hormones. Helps normalize blood cholesterol levels. With choline, inositol is used by the liver to manufacture lecithin. Inositol is the second most abundant vitamin in the body, after niacin. Recent studies indicate that inositol, with biotin, reduces loss of scalp hair.*
- *NIACIN or B3: Also known as nicotinic acid and niacinamide, which is an alternative form, niacin is essential to mental health. Dr. Abram Hoffer, a renowned pioneer in orthomolecular psychiatry, has completely relieved schizophrenic symptoms using niacin. The Physicians' Desk Reference, a pharmaceutical text used by doctors when prescribing medication, recognizes niacin as an effective cholesterol lowering agent.*
- *RIBOFLAVIN or B2 : The most common vitamin deficiency is that of riboflavin and results in cataracts, failing vision, watery eyes and uncontrollable eczema.*
- *THIAMINE or B 1 : A co-enzyme in the breakdown of dietary carbohydrate. Maintains levels of glucose in the blood. Deficiency results in weakness, cardiac damage, abdominal distention and poor oxygenation. Severe shortage results in death; critical toxemia develops from unmetabolized carbohydrate fragments.*
- *TOCOPHEROL or vitamin E : Spirulina contains more vitamin E per gram than pure wheat germ. This nutrient protects heart and vascular health, promotes oxygenation of cells, and retards aging.*

## Carotenoids:

*Some substances in plant foods are not true vitamins, but provide the precursors from which the body can then synthesize the appropriate vitamins. The carotenoid compounds of ENERGYbits® spirulina are of this nature, since they are used to produce vitamin A.*

*True vitamin A is found in the pre-formed state only in animal sources, such as liver. This is the form of vitamin A sometimes associated with toxicity and overdose, since it is fat-soluble and is not readily excreted from the body.*

*In contrast, the carotenoid complexes found in vegetable foods are converted to vitamin A only as it is needed, thus minimizing the dangers of toxicity. ENERGYbits® spirulina is a primary source of vitamin A precursors - it is from algae carotenoids that fish livers derive and concentrate vitamin A.*

*ENERGYbits® spirulina contains the yellow/orange pigments cryptoxanthine and beta-carotene from which vitamin A can be made. The carotenoids are in these forms:*

- Alpha-carotene
- Beta-carotene
- Xanthophyllis
- Cryptoxanthin
- Echinenone
- Zeaxanthin
- Lutein

## **Enzymatic pigments:**

*While the protein, mineral and vitamin value of ENERGYbits® spirulina is impressive, it is also rich in pigments that are bio-chemically important to life. Without pigments, organisms could not synthesize many of the enzymes necessary for balancing metabolism.*

### **Chlorophyll**

*The most visible pigment in ENERGYbits® spirulina is chlorophyll, a green molecule common to plants. Chlorophyll releases ions when struck by the energy of sunlight. These free ions proceed to stimulate the biochemical reactions that form proteins, vitamins and sugars.*

*Chlorophyll is sometimes called "green blood" because of its similarity to the hemoglobin molecule found in human blood cells. In fact, both are constructed of almost identical molecular structure called pyrrole rings, and both substances are chemically known as "porphyrin pigments" by scientists.*

*The difference is that chlorophyll contains a magnesium ion at its core, while hemoglobin (human blood) contains an iron molecule. Magnesium imparts a green color to the chlorophyll molecule and is involved in synthesis of other materials, while iron gives hemoglobin a red coloration and changes the function of the porphyrin molecule to respiration and breakdown of materials.*

*It is believed that if chlorophyll is ingested with sufficient iron, the magnesium can be displaced to yield a hemoglobin molecule. Experiments in Japan have demonstrated that Spirulina has a marked positive effect on anemia, possibly due to the conversion of chlorophyll into hemoglobin. Of course,*

*the high nutrient density of Spirulina, especially the blood-building vitamins B12 and folic acid and the amino acids, are also useful in treating cases of anemia.*

*Chlorophyll has other positive benefits to the body. It increases peristaltic action and thus relieves constipation, and also normalizes the secretion of digestive acids. It soothes the inflammation and reduces the excess pepsin secretion associated with gastric ulcers.*

*During World War II, when there was insufficient blood for blood transfusions to help the wounded, they were given liquid chlorophyll instead and healed just as quickly as if they had received the blood. Chlorophyll was also used topically to help heal injuries due to its drying action and antiseptic qualities which made it a common first-aid measure to prevent festering of wounds. Chlorophyll soothes swelling and promotes granulation, the process that regenerates new tissue over injuries.*

*Chlorophyll also appears to promote regeneration of cells, particularly damaged liver cells, and increases circulation to all the organs by dilating blood vessels. In the heart, chlorophyll aids in transmission of nerve impulses that control contraction. The heart rate is slowed, yet each contraction is increased in power, thus improving the overall efficiency of cardiac work.*

### **Phycocyanin**

*The pigment which gives ENERGYbits® spirulina its blue cast is phycocyanin, found in concentrations of about 7 percent, compared to the 1 percent chlorophyll content most commonly found (NOTE that RECOVERYbits® are 100% chlorella algae, which have the highest concentration of chlorophyll in the world and much more than ENERGYbits®). Phycocyanin is related to the human pigment bilirubin, which is important to healthy liver function and digestion of amino acids.*

### **Porphyrin**

*Another important pigment found in ENERGYbits® is porphyrin, a red compound that forms the active nucleus of hemoglobin. Related to this structure is the polypyrrole molecule of B12, which is essential to the formation of healthy red blood cells.*

*These and several lesser pigments such as **phycoerythrin, tetrapyrrole, phytonadione and the carotenoids** are not just the "color" of living organisms, but are used to carry on metabolic processes throughout the body. Without them, enzymatic reactions would be reduced until cellular disintegration occurred.*

## **Fats, sugars, salts and calories:**

*It is probably hard to imagine that a concentrated source of nutrients such as ENERGYbits spirulina is not also loaded with fats, starches and calories. Amazingly, ENERGYbits spirulina is only 7 percent lipid, and most of that is in the form of essential fatty acids that promote cholesterol normalization, reduce cellular inflammation and help the brain function properly by keeping all*

*brain cells tactile. The essential fatty acids include linoleic, linolenic and arachidonic acid. They are used by the body to manufacture Prostaglandins, the hormonal regulators of blood pressure and capillary resilience.*

*The essential fatty acids are involved in respiration in all the cells, and are especially important to oxygen transport. They affect the health of the hair, skin and nails, and help break up cholesterol in the blood stream. They are absolutely vital to health.*

*ENERGYbit®s spirulina contain very little starch or sugar. What carbohydrate they supply (under 10 percent), is primarily in the form of rhamnose and glycogen. These two polysaccharides are easily absorbed by human cells with minimal intervention by insulin. This is one of the reasons why ENERGYbits® spirulina sugars provide speedy energy, without taxing the pancreas or precipitating hypoglycemia. This is one of the reasons why they are perfect for anyone who suffers from blood sugar issues, hypoglycemia or diabetes.*

*From a caloric standpoint, ENERGYbits are the most efficient nutrition in the world. Each “bit” contains just one calorie so a single serving of 30 tabs which provides most of the necessary nutrition and protein your body needs for the day is only 30 calories. There are only 5 grams of raw protein in a serving of 30 tabs however since all of this protein is bio-available, your body interprets it to be the equivalent of 50 grams of protein (which is approximately your RDA for protein.)*

*Some people are concerned about sodium in their diets, and have therefore avoided seaweed foods such as nori, wakami and kombu. These kelp foods are very nutritious, but they do contain significant sodium amounts. On the other hand, ENERGYbits spirulina is grown in FRESH water, not saltwater and contain very little salt. In fact there is such small amounts of sodium in ENERGYbits® that even those on a salt restricted diet could easily take three or four times our recommended amounts of bits and still be significantly under their daily salt limits.*

We hope that you have enjoyed learning about some of the many nutritional components of ENERGYbits®. There are hundreds more but this will hopefully open your eyes to the vast array of health and energy improvements you can expect when you add it to your daily routine.

*Disclaimer: The information contained here is for educational purposes only and is not recommended as a means of diagnosing or treating an illness. All matters concerning physical and mental health should be supervised by a health practitioner knowledgeable in treating that particular condition.*

Would you like to feel better and have your nutritional needs met? If so, please consider adding ENERGYbits® algae to your diet. To learn more or purchase yours, please visit any of our websites.

[www.recoverybits.com](http://www.recoverybits.com)

[www.skinnybits.com](http://www.skinnybits.com)

[www.energybits.com](http://www.energybits.com)

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