

TOTAL GHR

Ingredients: Each tablet contains: Anterior Pituitary Peptides 7mg, Inositol phosphate 4mg, Inositol Hexanicotinate 12.5mg, Alpha Lipoic Acid 5mg, Lycopene 2mg, DHEA 4mg, IP6 (Inositol Hexaphosphate) 20mg, GABA 6mg, DMAE Bitartrate 13mg, PABA 10mg, 3-Acetyl-7-Oxo-DHEA 8mg, Phosphatidylserine 15mg, Phosphatidyl Choline 15mg, L-Glutamine 10mg, Arginine Pyroglutamate 75mg, Glutamic Acid (pyroglutamate) 10mg, L-Glycine 75mg, L-Lysine 75mg, L-Tyrosine 22mg, L-Taurine 31mg, L-Valine 75mg, L-leucine 30mg, L-Ornithine Alpha Ketoglutarate 75mg, D-Salina Beta Carotene (natural) 500 units, Pyridoxal-5-Phosphate 7mg, Gymnema Sylvestre 50mg, Mono, Poly and Oligo-Saccharides as specially processed beet (root) 20mg, Inulin 20mg, Whey Protein 30mg, Vitamin A 1000 i.u., Folic Acid 50mcg, Magnesium (as chelate) 3mg, Zinc (as chelate) 500mcg, Potassium (as aspartate) 2.8 mcg

Supportive Function: Supports: the natural release of growth hormone in the body, normal blood sugar levels, sound sleep, and antioxidant status. Growth hormone plays an important role in growth and repair processes, including lean muscle growth, fat burning, energy production, tissue repair, disease resistance, wound healing, memory, mental alertness, skin texture, sleep, bone density, normal cholesterol levels, sexual potency, and normal blood pressure.

When is Total GHR helpful? Anytime there is need for support in the area of growth and repair, i.e. the muscle repairs in Fibromyalgia, weight lifting, immune support, bone support, weight loss, etc.

Clinical Applications/Research: Anterior Pituitary Peptides (7mg) include somatomedin-C, called insulin-like growth factor IGF-1, whose synthesis is in turn controlled by the polypeptide GH. GH, a single chain polypeptide, is also produced by the anterior pituitary and has biphasic actions: the first is insulin-like and of short duration, increasing glucose uptake in muscle and fat, stimulating protein building in muscle and liver, and inhibiting fat breakdown in fatty tissues. The second phase is anti-insulin like and GH's more profound effects are prolonged: glucose uptake is inhibited, causing plasma blood sugar to rise, the breakdown of fat to increase, and mobilizing fat as an alternative metabolic fuel (*Merck Manual, 16th Ed., 1992:1055-1058*). Glandular nutrients are used to provide nutrition to support the healthy and proper functioning of the gland. Glandular nutrients are also believed to help repair damaged, deteriorated, or autoimmune system attacks on aging and malfunctioning glands and help restore them to normal activity (Balch & Balch, 1997: 551-552). Pituitary glandulars are contraindicated when tumor activity is present.

L-Glutamine (10mg) readily passes the blood-brain barrier where it is converted into glutamic acid. As glutamic acid, it picks up excess ammonia, which can inhibit brain functioning, and is converted back to glutamine in a continuous cycle. Glutamine is known as a primary brain fuel. It has been reported to improve intelligence, even the IQs of mentally deficient children, and helps prevent craving for alcohol and sugar. Glutamine helps alleviate fatigue, depression, and impotence and has been used successfully in the treatment of senility and schizophrenia (Mindell, 1991: 113).

L-Arginine Pyroglutamate (75mg) is one of the primary amino acids involved in the release of GH, which acts as a fat mobilizer, helping produce energy and helping trim down excessive fat. Arginine is essential for the normal functioning of the pituitary gland and is necessary for both the synthesis and release of the pituitary's GH. Arginine is metabolized from ornithine in a continuing cycle. In the role as ornithine, it helps insulin work as a muscle-building hormone. It is reported to aid in improving immune response and the healing of wounds, helps in metabolizing stored body fat and toning muscle, as well as promoting physical and mental alertness (Mindell, 1991: 110,112-113).

L-Glycine (75mg) has been reported helpful in the treatment of low pituitary gland function, the pituitary itself being the producer and storage depot of GH somatotropin. Glycine helps supply the body with creatine, important for healthy muscle function. It has been reported to be successful in the treatment of hypoglycemia and in certain kinds of academia, (low blood pH). Glycine plays a role in reducing hyperacidity and normalizing gastric acid secretion, which is known to decline with age, and is therefore essential for proper digestion of food (Levine, S, *Allergy Research Group Publication*, Concord, CA). It is methylated as betaine, which is important in digestion. Glycine is also a precursor to glutathione, an important detoxification compound, as well as being important to the synthesis of nucleic and bile acids. Additionally, it has helped regulate leucine imbalance associated with offensive body and breath odor (Mindell, 1991: 115).

L-Pyroglutamate (Glutamic acid) [10mg] together with glucose is a brain fuel. Glutamic acid helps detoxify the brain of ammonia and becomes glutamine. Deficiency has been reported to cause brain damage, or a brain that never gets into high gear (Passwater, R *L-Glutamine, The Surprising Brain Fuel*, pamphlet). It has been reported to help protect the brain from alcohol poisoning and reduce the craving for both alcohol and sugar. Abram Hoffer used it successfully in treating senility and schizophrenia (*Orthomolecular Psychiatry*, San Francisco: Freeman & Co., 1973). Passwater reported that supplementation has helped depression, IQ improvement in children, and epilepsy. Glutamic acid is also an essential component of folic acid.

L-Lysine (75 mg) deficiency has been associated with reduced ability to concentrate (Cheraskin & Ringsdorf, *Psychodietetics*, New York: Bantam Books, 1977: 22). Lysine is required for antibody formation, and deficiency symptoms include chronic tiredness, fatigue, nausea, and dizziness (Borrmann, *Comprehensive Answers to Nutrition*, Chicago: New Horizons, 1979: 10). Other lysine deficiency symptoms reported are hair loss and anemia. Lysine is essential for tissue repair, growth, hormone production, and enzymes (Mindell, 1991:109-110). Lysine readily converts to carnitine, which helps burn fat as fuel. Calvani (1992) reported carnitine as a nerve protective agent having antioxidant action, improving other brain chemicals such as acetylcholine, reversing neuron loss and age pigment accumulation in elderly animal brains and nerves. Carnitine has shown promise in both geriatric and Alzheimer's studies where it was credited with improvements in learning names, social participation, and motor activity (*Energy Times* Sept 1996: 61).

L-Tyrosine (22 mg) is formed from the breakdown of phenylalanine and is the precursor of thyroid, adrenocortical hormones, and dopamine. Tyrosine is a stimulating neurotransmitter and is reported to elevate mood and help act as an appetite suppressant (Mindell, 1991: 116). Pigmentation of hair and skin requires tyrosine. Tyrosine has been shown to help some Parkinson's patients and those diagnosed with depression (*Lancet* May 21, 1983: 1145). Small supplemental doses have been reported to be more effective than

large (*Biochemical Journal* 1982; 206:165). With choline and tyrosine precursors, essential neurotransmitters are reported to be readily synthesized. *Cautions:* should be used with caution in anyone with melanoma; should not be combined with anyone taking MAO inhibitor drugs.

GABA (Gaba Amino Butyric Acid) (6mg) is formed from glutamic acid, acts as regulator of neuronal activity, is essential to brain metabolism, and has been used in the treatment of epilepsy, hypertension, and enlarged prostate problems. GABA is said to produce calmness and tranquility by decreasing neuronal activity associated with manic and agitated behavior (Chaitow, 1988). It has been reported to help depressed sex drive in men with an excess of the hormone prolactin (Pearson & Shaw, 1982:202). GABA together with B3 and inositol prevent stress-related messages from reaching the motor centers of the brain (Balch & Balch, 1997: 38).

L-Ornithine Alpha Ketoglutarate (75 mg) is one of the amino acids known to help release GH. Ornithine is formed when arginine is broken down by arginase and is returned in a continuing cycle into arginine. Supplementation has been reported to stimulate the release of GH from the pituitary (Pearson & Shaw, 1982:289-290). Arginine and ornithine have also been reported to convert into growth stimulant polyamines (Pearson & Shaw, 1982: 345). Supplementation has been reported to improve immune response to viral, bacterial, and tumor activity (Mindell, E *Ornithine*, pamphlet, 1982). *Caution:* supplemental ornithine should not be taken by people with a history of schizophrenia since symptoms may worsen if ornithine or arginine are used excessively (Chaitow, 1988).

Potassium Aspartate (14mg) is one of four minerals known to stimulate the release of GH. The aspartate-chelated form of potassium is formed from aspartic acid, helping its absorption. Aspartic acid in itself has been reported to help expel excess ammonia from the circulatory system, protecting the central nervous system, increasing resistance to fatigue, and promoting improved stamina and endurance in athletes. Potassium is reported to help in clear thinking by assisting in sending oxygen to the brain and helping to remove body wastes (Mindell, 1991:112, 114, 87).

Inositol Hexanicotinate (12.5 mg) deficient mice develop baldness, and inositol may be of value in reducing the rate of human balding. In 10% of small samplings, inositol has been reported to be responsible for reversing graying hair back towards its original color. It is a muscle sugar metabolized in the same ways as other carbohydrates but without the effect of raising insulin levels. It is necessary for the growth of muscle cells in tissue cultures (Pearson & Shaw, 1988: 476-477).

3 Acetyl-7-oxo-DHEA (4mg) retains the benefits of DHEA, but does not convert into sex hormones. It supports immunity, body composition, memory, mood, and thinking ability. DHEA is produced abundantly during youth, peaking in production about age 25, gradually declining until, by 80 years of age, we produce only 10-20% of the DHEA adrenal hormone we had at 20. DHEA plays many roles in enhancing health and longevity, helping generate the sex hormones testosterone and estrogen, enhances muscle mass, decreases body fat, and stimulates the formation of strong bone. In a 1986 study with 246 middle aged and elderly men that lasted 12 years, small doses of DHEA were reported to be responsible for a 48% reduction in death rate from heart disease and a 36% reduction from death from other causes. In a 28-day study, DHEA therapy was credited with 31% reduction in body fat without changing overall body weight. Middle aged and elderly men were reported to experience better stress coping abilities, an improved sense of well-being, increased mobility, decreased pain, and higher quality sleep. Other studies

show many beneficial affects in helping prevent many diseases while improving memory. In animal studies, DHEA has increased life span by as much as 50% (Balch & Balch, 1997: 544-545). *Caution*: contraindicated in hormone related cancers.

IP6 (Inositol Hexaphosphate) [20mg] is a powerful antioxidant naturally present in whole grains and high fiber foods. IP6 has been reported to boost the immune system's natural killer cells, called lymphocytes. IP6 is known to prevent blood clots and platelet stickiness, a major cause of heart attacks and strokes, as well as reduce cholesterol and fatty acids in the blood stream. It is reported to be helpful in preventing kidney stones and preventing accumulation of fatty deposits in the liver. Population studies show the people who consume diets high in IP6 also show a lower incidence of colon, breast, and prostate cancers. IP6 supplementation in combination with inositol has been reported to show visible signs of tumor regression (Pirisi, A, "Health Brief, IP6, This potent antioxidant can help your body fend off cancer and heart disease," *Natural Health* March 1999: 138)

Mono, Poly, and Oligo-Saccharides as specially processed Beet Root (20mg) are soluble fiber carbohydrates that are indigestible to humans but fermentable by human friendly micro flora into useful short chain fatty acids (SCFAs). SCFAs regulate glycolysis, gluconeogenesis, lipid metabolism, and mineral absorption, and provide potential for better health by producing higher levels of propionate and butyrate rather than acetate. Propionate is known for its positive effects on glycogen formation, normalizing blood glucose and having effects on reducing cholesterol formation. Butyrate is utilized primarily as energy for colon cells and is a strong differentiating agent, having implications for inhibiting proliferation of colon cancer cells. Combinations of these soluble fiber components are likely to produce desirable health effects (Tungland, BC, Vice President, Scientific and Regulatory Affairs, Imperial Suiker Unie, LLC, ©American Association of Cereal Chemists, 1999, online discussion group among industrial, academic, and governmental agencies, http://www.scisoc.org/aacc/DietaryFiber/DDF-right_responses.htm)

Inulin (20 mg), called D-fructose polysaccharide, adds soluble dietary fiber to the diet without adding calories, and is safe for diabetics to use, and stimulates the beneficial growth of friendly bacteria in the intestinal tract 8-fold while discouraging the growth of unfriendly bacteria such as fusobacteria and clostridia. The results are improved bowel habit, increased frequency of bowel movement, improved absorption of calcium and magnesium as well as other minerals, increased production of B vitamins by friendly bacteria, and slightly lowered blood sugar and blood pressure. There is also promising evidence in animal studies of a preventative effect against colon cancer (Schneeman, BO, "Fiber, inulin and oligofructose: similarities and differences," *J Nutr* Jul 1999; 129(7) Suppl: 424S-7S; Kleessen B, et al., "Effects of inulin and lactose on fecal micro flora, microbial activity, and bowel habit in elderly constipated persons," *Am J Clin Nutr* May 1997; 65(5): 1397-402; Gibson GR, et al, "Selective stimulation of bifidobacteria in the human colon by oligofructose and inulin," *Gastroenterology* Apr 1995; 108(4): 975-82).

Zinc Chelate (5mg) is one of four minerals known to stimulate the release of GH. Zinc is essential for the body's protein synthesis, regulates the contraction of muscle, and is important in the formation of insulin. Zinc has been reported to accelerate healing time, eliminate taste loss, promote growth, and mental alertness (Mindell, 1991: 112, 94). Zinc is also essential to the absorption of vitamin A.

DMAE Bitartrate (13 mg), dimethylaminoethanol, forms a biological detergent that can be useful for age pigment, lipofuscin, removal from the aging body. This age pigment accumulates on skin and nerve cells as we age, eventually blocking the flow of nutrients to nerve cell fibers, resulting finally in the death of nerve cells themselves. As nerve cells stop communicating properly with each other, mental functions deteriorate (Pearson & Shaw, 1982: 495; 122-123).

Vitamin A Palmitate (1000 i.u.) promotes growth, healthy hair, skin, teeth, gums, and bones. It has been reported to help in the removal of age spots, to treat acne and superficial wrinkles when used externally. The palmitate form is particularly helpful to individuals intolerant to or sensitive to oils, such as persons prone to acne (Mindell, 1991:26-28).

Pyridoxal 5 Phosphate (7mg), a portion of vitamin B6, is one of 3 vitamins known to trigger the nighttime release of GH during sleep. It has been reported to help in the synthesis of anti-aging nucleic acids (Mindell, 1991:33).

Phosphatidylserine (15mg) is found in high concentrations in the brain. Supplementation has been reported to improve mental functioning in individuals diagnosed with Alzheimer's disease (Crook, T, et al, "Effects of phosphatidylserine in Alzheimer's disease," *Psychopharmacol Bull* 1992; 28: 61-66). After 45 days of supplementation, depression has been reported to be 60% less with phosphatidylserine supplementation than placebo controls in older women (Maggioni, M et al, "Effects of phosphatidylserine therapy in geriatric patients with depressive disorders," *Acta Psychiatr Scand* 1990; 81:265-70).

Phosphatidylcholine [15mg] (supplying L-Alpha Glycerlphosphoryl choline) is necessary to supply nutrients to physiologically active neurotransmitters together with tyrosine. Phosphatidylcholine is a pure form of lecithin, which readily converts into the neurotransmitter choline. With methionine, choline and folic acid assist methionine in its detoxification activities. The ability of the brain to manufacture and use a large number of neurotransmitters important in normal brain function largely depends on the concentration of choline in the bloodstream (Chaitow, 1988: 77, 63, 56, 26). Without choline, brain function and memory can be impaired (Balch & Balch, 1997:17).

Whey Protein (30mg) provides branched-chain amino acids (BCAAs), leucine-isoleucine-valine, essential for maintenance of muscle tissue and helpful during physical stress. It can be helpful in supporting athletic performance by reducing protein breakdown. During recovery from surgery, BCAAs have been reported to reduce muscle loss and speed muscle gain. BCAAs may also be useful in preventing muscle breakdown generally. BCAAs have also been reported to help with ALS, Lou Gehrig's Disease, in maintaining muscle strength (Lininger, et al, 1998: 138). Whey itself is one of the best natural sources of vitamin B13, orotic acid, and is believed to help prevent premature aging, as well as help metabolize folic acid and vitamin B12 (Mindell, 1991:37).

Inositol Phosphate (4mg) is essential to the body's production of lecithin, which assists in all of choline's activities, including the healthy production of antibodies (Chaitow, 1988:56). Taken before bedtime, it can improve the quality of sleep. Inositol is essential for hair growth. Deficiency can result in hair loss, constipation, arteriosclerosis, mood swings, and skin eruptions (Balch & Balch, 1997:18).

Folic Acid (50mg) is considered a brain food, needed for energy production and the formation of red blood cells as well as the proper functioning of white blood cells. It is important for continued healthy cell division and replication. Supplementation has been reported to help in depression and anxiety. Deficiency symptoms include fatigue, apathy, graying hair, insomnia, weakness, digestive disturbances, and memory problems (Balch & Balch, 1997: 17). Folic acid is required for enzymatic reactions involving homocysteine, a powerful oxidant associated with symptoms of cardiovascular disease, ocular and neurological problems, brittle hair, thin skin, and muscular degeneration (Stanbury et al, *Metabolic Basis of Inherited Diseases*, New York: McGraw Hill, 1983; *N England Med J* 1983; 309(8): 448-453). Folic acid is also an essential component of glutamic acid.

Lipoic Acid (5mg) is essential in the Krebs's energy cycle and glycolysis, the metabolism of glucose. It is necessary for the body's production of energy. Used in Germany to enhance liver function, the liver relies on these processes to meet its large energy needs (Balch & Balch, 1997: 97).

Lycopene (2mg) is a member of the carotene family, including beta-carotene, found principally in tomatoes and tomato products. Lycopene has potent antioxidant capabilities. Of the carotenes investigated in one Harvard study, the men who had the greatest amount of lycopene showed a 21% decreased risk of prostate cancer. Lycopene has also been shown to be a more potent inhibitor of cancer cells than other carotenoids. For 25% of the people with the greatest tomato intake, the risk for cancers of the GI tract was 30-60% lower than those who ate fewer tomatoes (Giovannucci, E, et al, "Intake of carotenoids and retinol in relation to risk of prostate cancer," *JNCI* 1995; 87: 1767-76; Francesci, S, et al, "Tomatoes and the risk of digestive tract cancers," *Int J Cancer* 1994; 59:181-84).

L-Taurine (31mg) has been shown to stimulate the production of growth hormone in animal studies (Chaitow, 1988). In balance with Glycine and GABA, neuroinhibitory transmitters, it plays a role as a neurotransmitter. It helps balance the composition of bile, maintaining the solubility of cholesterol, called a "superior biological detergent" (*Am J of Clin Nutrition* 1983; 37(2): 221. Taurine seems to balance other amino acid levels, which have been found to be unbalanced in epilepsy. (*Epilepsia* 1975; 16:245-249). Full spectrum light increases levels of taurine in pineal and pituitary glands (the seats of melatonin and of Growth Hormone release) and artificial light may cause this taurine level to decline. Low doses have been shown to be more effective than high doses since taurine accumulates quickly and is only slowly metabolized (*Life Sciences* 1978; 22:1789-98).

Magnesium Chelate (15mg) is one of four minerals known to stimulate the release of GH. Magnesium is essential for proper nerve and muscle function, is important for converting blood sugars into energy, and is known as an anti-stress mineral, among a multitude of other beneficial functions (Mindell, 1991: 112, 81).

Beta Carotene (500 units) is the precursor to vitamin A and is converted into vitamin A except in diabetics. It is responsible for yellow-orange coloration in carrots and other vegetables and fruits. It acts as a powerful free-radical scavenger of singlet oxygen and has been reported to prevent free-radical damage to DNA and cellular tissues that increase with aging. It has been shown to reduce photosensitivity in humans and helps prevent the damaging effects of excess sunlight in the aging of human skin (Pearson & Shaw, 1988: 476). Beta-carotene levels in the body are known to decrease with old age, dieting, smoking, and heavy alcohol consumption (Mindell, 1991:68).

L-Valine (75mg) together with leucine are components of Branched Chain Amino Acids and are reported to help promote natural, anabolic muscle building. Valine helps regulate protein use by muscle, providing a principle source of energy for human muscles. Valine helps reverse muscle breakdown and rebuild muscle tissue. Valine is reported to directly benefit muscle and body weight changes by promoting lean muscle distribution (Mindell, 1991). It has been reported as useful in insomnia, nervousness, emotional upsets, proper muscle, and mental functioning (Borrmann, W, *Comprehensive Answers to Nutrition*, Chicago: New Horizon, 1979). Valine can reduce appetite while helping the body preserve protein storage, is reported to help produce a feeling of fullness or satiety, and thus may be useful in preventing overeating (Mindell, 1991:119-120; *American J of Nutrition* 1982; 34(10): 2045). In aging research, overeating is one of the known causes of aging and under eating one of the

known causes of longevity (Burton Goldberg Group, *Alternative Medicine, The Definitive Guide*, Fife, Washington: Future Medicine Publishing, 1995: 945).

L-Leucine (30mg) is another Branched Chain Amino acid, a principal component of human muscle. It has been reported to promote lean muscle distribution, build muscle tone, and provide a primary source of calories for muscle energy together with valine and isoleucine (Mindell, 1991: 119-120).

PABA (10mg), p-aminobenzoic acid, is a B vitamin produced naturally in the human body. It acts as an antioxidant and membrane stabilizer, and it has been shown effective in rat studies to protect against the damaging effects of ozone in smog. It has been reported to help prevent hair loss and to darken graying or white hair in 10% of individuals studied. PABA is reported to absorb ultraviolet light and block the mutagenic and carcinogenic effects of excessive sunlight exposure responsible for damaging and aging skin. *Caution:* it counteracts the effects of sulfa drugs so should be discontinued during sulfa medication (Pearson & Shaw, 1988: 473-474).

Gymnema Sylvestre (50mg) was first demonstrated to have a blood sugar lowering effect in the 1920s. It has been used in India for the treatment of diabetes for 2000 years. In addition to gymnema helping the pancreas produce insulin, it has also been reported to improve insulin's ability to lower blood sugar (Lininger et al., 1998: 43, 275-6). High blood sugar levels have been shown to be counterproductive to the release and utilization of Human Growth Hormone. Avoiding the consumption of simple sugars of all kinds, sugary foods and drinks, during the day, avoiding eating before exercising, and especially avoiding sugars before going to bed, have been reported helpful in the release of Human Growth Hormone. HGH is released during exercise when blood sugar levels are stable, and HGH is released during sleep when blood sugar levels are not high (Balch & Balch, 1997: 553).

Testimonials/Nutrient Tidbits: A doctor reports... I lost 20 pounds while taking Total GHR (reported at a Florida seminar on chronic fatigue and Fibromyalgia).

A doctor reports... I had a patient with Ankylosing Spondylitis who responded wonderfully to a protocol of Total Multimune, Total GHR, and Liga-PN – (Dr. Sigh, Loveland, CO.)

Another doctor reports... This product is great support for fibromyalgics. Most of them do not sleep well enough to produce the growth hormone necessary to repair muscle tears overnight.

Another doctor reports... This product convinced one of my patients to go off thyroid meds because she felt so much better. (Vince Wood, D.C. Cedaredge, CO.)

Suggested Dosage: 1 to 3 tablets on an empty stomach right before bed for 5 consecutive nights, discontinue for 2 nights, repeat cycle for as long as directed by your health care professional, or on an empty stomach before peak exercise, or in programs of physician-assisted fasting. (Dr. Brimhall has found that some patients do better taking the supplement on an empty stomach in the morning.)

Size: 63 tablets

Vegetarian: No

Contraindications: PABA is contraindicated during treatment with sulfa drugs. DHEA itself is contraindicated in hormone related cancers, and growth hormone itself is contraindicated in tumor growth (only precursors are used here). Ornithine should not be taken by people with a history of schizophrenia (Chaitow, 1988). L-Tyrosine should be used with caution in anyone with melanoma, and should not be combined with anyone taking MAO inhibitor drugs. Pituitary glandulars are contraindicated when tumor activity is present.