



Adrenal Support

Stock #1507-0 (60 capsules)

The adrenal glands play a critical role in the regulatory mechanisms that assist the body in adapting to stress. Prolonged stress—whether resulting from mental and emotional upset or due to physical factors such as chemical exposure, excessive exercise, malnutrition, sleep deprivation, surgery, or numerous other environmental causes—results in measurable changes in hormone levels and enzymes, as well as cardiovascular, immune and gastrointestinal functions. These systemic changes significantly contribute to many stress-related health problems, including the development of hypertension (high blood pressure) and atherosclerosis, insulin resistance, certain immune function disorders, and even deficits in memory and mental processes. Fortunately, animal and human research has identified a variety of nutritional and botanical substances that regulate and enhance the body's ability to respond to stress and may help prevent stress-related illness.¹⁻⁴

Adrenal Support contains a wealth of nutrients that are necessary for healthy adrenal gland function. Adrenal Support provides important vitamins, essential minerals and adaptogenic herbs that help improve the body's ability to handle stress, protect against stress-induced oxidative (free radical) damage, enhance immune and nervous system functions, and combat stress and fatigue. Adrenal Support also contains adrenal glandular substances that provide additional nutritional factors to nourish and strengthen the adrenal glands. Adrenal Support contains:

Vitamin C is an important anti-stress antioxidant and vital nutrient for adrenal function. Vitamin C is more highly concentrated in the adrenal cortex than in any other organ, and when the adrenals are under stress, vitamin C levels are depleted. Experimental and clinical evidence suggests that supplemental vitamin C in levels significantly greater than the RDA (recommended dietary allowance) can support adrenal function and decrease high cortisol levels—elevated cortisol levels suppress the immune system. Likewise, animal research has shown that megadoses of vitamin C (equivalent to several thousand milligrams in humans) significantly reduces stress-hormone levels and other indicators of emotional and physical stress, including adrenal gland enlargement and changes in the thymus and spleen. Furthermore, vitamin C has been shown to improve the ability of the adrenal glands to adapt to surgical stress in lung cancer patients.^{1,2,4,5-8}

Thiamine (vitamin B1) acts as a coenzyme in the conversion of glucose into energy. Experimental and clinical results have demonstrated the effectiveness of thiamine in protecting the adrenal glands from functional exhaustion secondary to surgery. In addition, positive results of experimental and clinical studies have shown that supplementation of thiamine in doses much higher than the RDA can support adrenal gland function. Furthermore, thiamine is essential for healthy nervous system function and has been termed the "morale vitamin" as a result of its beneficial effect on mental attitude. For example, 4 double-blind studies demonstrated an association between improved thiamine status and elevated mood, while a study of 120 young adult females found that improvement in thiamine status correlated with reports of participants being more clear-headed, composed and energetic—these results were demonstrated in participants whose thiamine status was "adequate" according to traditional standards.^{2,9-11}

Riboflavin (vitamin B2) is essential for endocrine health and functions as a necessary component in the metabolism of carbohydrates, fats and proteins for energy. Riboflavin also plays a role in maintaining glutathione, one of the body's most important antioxidants. Glutathione protects the adrenal cortex against a large number of toxic chemicals. Consequently, depletion of glutathione contributes to the development of chemically-induced adrenocortical necrosis (the death of adrenal cortex cells). Thus, riboflavin deficiency can result in enhanced oxidative stress, as well as a lack of stamina and vigor, due to mitochondrial dysfunction (disrupted energy production).^{1,9,12-14}

Vitamin B6 (pyridoxal-5-phosphate) is essential for growth and maintenance of nearly every body function. Vitamin B6 is necessary for the conversion of tyrosine (an amino acid) to dopamine, an adrenaline precursor. In addition, vitamin B6 is vital for normal adrenal function—experimental and clinical studies show that vitamin B6 supplementation in doses significantly higher than the RDA support adrenal gland function. Furthermore, vitamin B6 status significantly affects the production of neurotransmitters such as serotonin and GABA, which control anxiety, depression and pain perception. Unfortunately, human studies indicate that the bioavailability of vitamin B6 from natural food sources is limited. Vitamin B6 is converted in the liver into pyridoxal-5-phosphate (PLP), the metabolically active form of vitamin B6. Individuals with poor liver function may not be able to adequately convert "inactive" forms of vitamin B6 (such as pyridoxine hydrochloride) into PLP.^{1,2,5,15-17}

Pantothenic acid (vitamin B5) - A close correlation exists between tissue levels of pantothenic acid and the

Pantothenic acid participates in nerve transmissions and in the production of adrenal hormones that control the body's reactions to emotional and physical stress and the "fight-or-flight response." Pantothenic acid can also improve the body's ability to withstand stressful conditions. Based on animal and human trials, pantothenic acid supplementation is important in order to maintain adequate levels in individuals under stress—evidence indicates that adrenal cortex function is compromised when there is a deficiency of pantothenic acid derivatives and metabolites. Furthermore, pantothenic acid deficiency can lead to adrenal atrophy, characterized by mental depression, fatigue, headache, sleep disturbances, abdominal discomfort and nausea, and motor nerve dysfunction.^{2,7,9,16,18,19}

Magnesium demonstrates a protective effect against stress-induced physiologic damage. Research has shown a negative correlation between magnesium balance and oxidative stress—chronic stress or injury reduces magnesium levels and simultaneously increases the intensity of oxidative stress upon the body. Magnesium deficiency also increases the risk of stress-induced cardiovascular damage. In addition, magnesium deficiency has been shown to impair vitamin B6 status. Furthermore, animal studies have found that magnesium deficiency decreases specific immune response and accelerates the progressive degeneration of the thymus.^{1,20-25}

Zinc is an essential trace mineral that contributes to the normal absorption and action of vitamins, especially the B-complex vitamins. Zinc is also essential for normal functioning of the central nervous system, and plays a critical role in the health of the adrenal glands—zinc is recommended for adrenal insufficiency. Evidence suggests that zinc levels decline following physical and mental stress. For example, a study of rats showed that plasma zinc levels significantly decreased after trauma. In another animal study, dietary zinc deficiency impaired the response of brain metallothioneins (MTs)—low molecular weight proteins that regulate cellular adaptation to stress—during stress in a highly specific manner. Furthermore, zinc deficiency has been shown to increase oxidative stress; cause alterations in adrenal secretion; and impair a large number of immune functions and defense mechanisms.^{5,9,16,19,26-30}

Potassium is an essential mineral required for proper energy metabolism and cell function. Potassium also assists with muscle contraction and transmission of nerve signals, regulates fluid and mineral balance, and facilitates kidney function. In addition, potassium is vital for normal blood pressure—decreased potassium intake may result in hypertension and heart disease. Furthermore, potassium deficiency is one of the major causes of adrenal exhaustion.^{16,31,32}

Adrenal substance - Raw animal glandular tissues are used to nourish the corresponding human gland and support its function. Published research dating back to 1931 indicates that oral adrenal extracts have been used in medicine and have been found to be effective. Adrenal extracts provide the body with nutritional factors that can help stimulate a sluggish gland and enhance its function. Used in conjunction with supportive nutrients such as vitamin C, potassium and pantothenic acid, bovine adrenal extracts are most often recommended for low adrenal function, characterized by fatigue, inability to cope with stress, and reduced resistance to infection. Adrenal substances have been derived from certified BSE-free (Bovine Spongiform Encephalopathy-free) cows from New Zealand.^{1,5,16,33-35}

Schizandra appears to have adaptogenic properties that enhance the body's resistance to a variety of physical, chemical and emotional stresses, while simultaneously improving overall regulation of physiological functions. For example, schizandra has been used to combat the effects of stress and fatigue, while some scientific studies have shown that schizandra provides a normalizing effect in cases of insomnia and physical duress. Schizandra also counters the effects of caffeine and improves mental function. In addition, available data show that schizandra decreases fatigue, increases work capacity, accelerates recovery time following exercise in athletes, and enhances the hepatic (liver) glutathione antioxidant system. Furthermore, experimental evidence suggests that schizandra exhibits antibacterial activity and functions as a potent antioxidant—active constituents demonstrate strong scavenging effects against active oxygen radicals.^{1,36-39}

Borage oil - Results from both animal and human studies suggest that borage can improve the body's response to stress. For example, borage oil was shown to improve cardiovascular reactivity to acute stress—borage oil reduced blood pressure and heart rate responses to stress in 10 men. In a more recent animal study, borage oil lowered systolic blood pressure by inhibiting adrenal responsiveness to angiotensin II—a chemical that increases blood pressure by narrowing the arteries. In addition, borage reportedly acts as a restorative agent on the adrenal cortex.⁴⁰⁻⁴³

Licorice exhibits a regulatory action on the adrenal glands and appears to have an effect on every system of the body. Licorice contains the active component glycyrrhizin, which can bind to glucocorticoid receptors, thus enhancing the activity of cortisol—a steroid hormone involved in glucose control, carbohydrate/fat/protein metabolism, inflammatory regulation, and the stress response. Glycyrrhizin also suppresses 5-beta-reductase, the main enzyme responsible for inactivating both cortisol and aldosterone—a steroid hormone that regulates the body's electrolyte balance. Licorice may be most beneficial in circumstances involving prolonged stress, where the ability of the adrenal glands to respond by releasing cortisol has been diminished. Furthermore, licorice may also be helpful for adrenal

corticoid abnormalities such as adrenal insufficiency, adrenal enzyme deficiency, adrenalectomy (removal of both adrenal glands) and Addison's disease—failure of the adrenal cortex to produce aldosterone and cortisol.^{2,5,16,38,44}

Protease blend - Proteases are enzymes that break down proteins into single amino acids. As with other proteins, raw animal glandular tissues must be digested or broken down in order to extract their nutrients. Incomplete digestion of proteins can result in a number of health problems, including the development of allergies, loss of nutrition, and the build-up of toxins in the bowel. Thus, protease enzymes facilitate the digestion of glandular substances to ensure optimal assimilation of their nutritional factors.^{33,45}

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