

Cortisol Control Formula™

A unique botanical formula to regulate cortisol levels.

Cortisol Control Formula, designed by Dr. Moss to regulate cortisol and improve adaptation, contains adaptogenic herbs as described in The Adaptation Diet. It also contains phosphatidyl serine, a key component of the brain which helps regulate cortisol production. In addition, several of the botanicals in the Cortisol Control Formula are anti-inflammatory and possess anti-oxidant properties reducing the body's demand for cortisol. All of these natural substances can help with weight loss and overall well-being.

Normalizing cortisol can:

- reduce excess abdominal fat and improve body composition
- decrease the risk for diabetes, heart disease, cancer and premature aging
- lose weight and improve energy, cognitive function and mood
- improve the ability to adapt to emotional and situational stress

Following is a brief description of the major adaptogenic botanicals in the Cortisol Control Formula.

Siberian Ginseng

One of the most widely studied adaptogens is Siberian ginseng (*Eleutherococcus senticosus*). Siberian ginseng used as a supplement showed an increased ability to adapt to adverse physical conditions as well as improved mental performance and enhanced quality of work under stressful conditions. It has shown strong antioxidant effects and the ability to protect nerve and heart cells from damage.

Siberian ginseng has six compounds that are antioxidants, four with anticancer activity, three that lower cholesterol, two that stimulate the immune system, and one that modulates insulin levels. Siberian ginseng appears to improve hypothalamic receptor sensitivity, leading to reduced abnormal cortisol production, less immune suppression, lower blood pressure, and improved glucose metabolism. It acted as a true adaptogen demonstrating increased cortisol output below a stress threshold and decreased cortisol output above a stress threshold, enhancing the physiologic response to mild stress and modulating the response to extreme stress. It prevents some of the immune suppression seen with elevated cortisol. Siberian ginseng can normalize blood sugar through stimulating the release of

glycogen stored in muscles for immediate energy, reducing long-term elevation of glucose and insulin resistance, and reducing catabolic (muscle-wasting) effects on muscle and endurance.

Ashwagandha

Ashwagandha (*Withania somnifera*) has been used for centuries in Indian Ayurvedic medicine to improve adaptation to both physical and emotional stress. Animals pretreated with this adaptogen and exposed to stressful conditions did not have as much adrenal hypertrophy, blood-sugar elevation, or cortisol depletion as untreated animals. Ashwagandha also has anabolic activity (increasing androgens, such as DHEA, needed for tissue repair), and normalizes inflammatory prostaglandins. It also reduces catecholamine (epinephrine) production and normalizes blood sugar and cholesterol levels.

People treated with ashwagandha report feeling less anxious in stressful situations. It appears to enhance GABA levels and in animal models has a neurorestorative effect in Parkinson's and Alzheimer's disease. In addition, it demonstrates significant immune-enhancing effects as well as anti-inflammatory properties. Other stress-modifying effects include reduction of the incidence of peptic ulcers and improvement of thyroid function.

Rhodiola Rosea

Rhodiola rosea (also called Arctic root) is native to high mountainous areas of Asia and Eastern Europe. It is another herb that the Soviets studied extensively, finding that it enhanced work performance and resistance to stress. I have found it is one of the most clinically useful adaptogens, especially when combined with phosphatidylserine, which improves the midbrain's response to stress.

Studies have demonstrated an anti-fatigue effect in patients suffering chronic stress. It can increase attention and learning mainly through lowering cortisol levels. Morning cortisol response, which is often elevated in chronic stress, was significantly lowered with the use of rhodiola. It appears to be particularly useful in people suffering 'burnout' type fatigue. In addition, rhodiola's lowering cortisol levels was shown to have an anti-depressant effect in patients suffering mild to moderate depression.

Rhodiola appears to affect neurotransmitters, including dopamine, serotonin, catecholamines, (adrenalin) and beta-endorphins. It is also cardioprotective, maintaining higher levels of cAMP (an energy-producing enzyme) in the heart muscle. It reduces catecholamine stimulation of cardiac tissue, leading to less arrhythmia. It is often useful in the person who is easily over stimulated and is wired

and tired. Rhodiola also stimulates immune function while reducing stress-induced beta-endorphin production. (Beta-endorphin and ACTH are both produced in the pituitary as a response to stress.)

Cordyceps

Another potent adaptogen, especially useful with “adrenal fatigue,” is cordyceps (*Ophiocordyceps sinensis*), a medicinal mushroom that is one of the most valued therapies in Chinese medicine. Wild cordyceps is a rare, blade-shaped fungus found at high altitudes in China and Tibet. Chinese scientists have been able to produce a water-soluble extract of the mycelial component of the fungus that contains the active ingredients cordycepic acid and adenosine.

Cordyceps has been used in traditional Chinese medicine to support vitality, improve kidney and lung function, and enhance libido. It has been shown to have beneficial effects on immune function as well as normalizing glucose metabolism. As an adaptogen, cordyceps has been shown to have substantial effects on adrenal function and is especially helpful in people dealing with high level stress. It appears to balance the HPA axis reducing anxiety, fatigue and insomnia.

Hot-water extract of cordyceps improves endurance of mice in response to physical stress, inhibits cholesterol elevation, and inhibits enlargement of the adrenal glands. (The size of the adrenal glands is often used as a measure of stress effects, because chronic allostatic load typically increases the size of the adrenal glands as the body attempts to react to the stressful situation.) Rats increased their ability to secrete cortisol when stimulated with cordyceps in a manner differing from stimulation by ACTH.

Pantothenic Acid

Pantothenic acid (B5) is found in many foods, including eggs, yeast, red meat, poultry, and whole grains, yet despite its widespread availability, many of my patients respond to supplementation with improved adaptation. Deficiency of B5 compromises adrenal function, while supplementing with B5 can also down regulate hypersecretion of cortisol secondary to high-stress conditions. Fatigue and intolerance to stress can be a sign of B5 deficiency.

Turmeric

Turmeric contains curcumin, a potent antioxidant that influences cell signaling pathways. Turmeric inhibits the inflammatory process and reduces the need for cortisol production, lowers total cholesterol, raises HDL, and prevents abnormal clotting. Turmeric reduces lipid peroxides, a measure of oxidant

stress, and protects lipids from oxidation. This spice is found in yellow curry, prepared mustard, and as a supplement.

The Formula contains curcumin as Meriva® which combines turmeric extract with phosphatidylcholine from soy lecithin forming a bioavailable turmeric phytosome complex that is significantly better absorbed than regular turmeric extracts. Meriva® phytosome complex greatly increases curcumin stability and enhances oral absorption by over 20-fold.

Green Tea

A superstar of the flavonoids is green tea, produced by lightly steaming the leaves of the tea plant (*Camellia sinensis*). Polyphenols, the biologically active compounds in teas, are partially deactivated when tea is oxidized, as in black tea. The polyphenols in green tea include catechin, proanthocyanadins, and epigallocatechin, considered the most active flavonoid in tea.

Green tea polyphenols have shown higher antioxidant activity than vitamin C and vitamin E. Green tea can also increase the activity of detoxifying enzymes, including glutathione and catalase, active in the liver, lungs, and small intestine. Green tea activates both Phase I and Phase II detoxification. All of these effects can reduce the need for cortisol making green tea a powerful adaptogen.

Green tea consumption has been linked to reduced incidence of many cancers, including stomach, small intestine, bladder, prostate, skin, pancreas, colon, breast, and lung. The lower incidence of cancer in Japan might be explained at least in part by green tea consumption. One of the effects of green tea is to normalize gene expression, reducing cancerous cellular changes. Green tea appears to inhibit estrogen's stimulation of breast receptors in estrogen-sensitive cancers. Additionally, green tea suppresses the activation of carcinogens, detoxifies carcinogens, and inhibits nitrosamine production from foods such as bacon, hot dogs, ham, and other processed meat.

Phosphatidylserine

Phosphatidylserine (PS) is a major component of cell membranes, found in high concentrations in the brain, and may restore sensitivity to cortisol receptors in the midbrain, hypothalamus, and pituitary to improve the feedback loop when cortisol levels are elevated. This is particularly important because long-term elevation of cortisol can damage the cells in the hippocampus that regulate cortisol secretion, disrupting the normal feedback control over production of this hormone. It may also affect synthesis of all the neurotransmitters in the brain.

I have used phosphatidylserine with my patients to help dampen excess cortisol production, improve memory, and treat depression. I often have them use it at night if there are symptoms of insomnia, anxiety, and memory loss. If tests reveal elevated cortisol at other times of the day, the PS is used at those times. Elevated nighttime cortisol occurs with breakdown of the feedback to the midbrain and is strongly associated with depression, anxiety, and insomnia.

Phosphatidylserine was first isolated in 1943 and has been extensively studied in more than three thousand papers. It contains both fatty acids like DHA, an omega-3 essential fatty acid, and amino acids. It is vital to the function of brain cells and other cells throughout the body. Dietary sources of PS are organ meats, chicken skin, fatty fish, and red meats. The average daily intake in Western diets is 130 milligrams; however, a low-fat diet provides even less. In the 1980s, the average intake was 250 milligrams. Modern food production of fats and oils decreases all the natural phospholipids in our diets, including phosphatidylserine.

Phosphatidylserine (like phosphatidylcholine found in lecithin) is a phospholipid that is incorporated into cell membranes, especially in the brain. PS has been shown to reduce cortisol response in both psychological and physical stress. In a 2008 study by Starks and colleagues, short-term supplementation of phosphatidylserine was able to blunt increases of cortisol after exercise by 39 percent compared to placebo. Ten healthy males were given 600 milligrams of phosphatidylserine or placebo for ten days and their cortisol levels measured after moderate exercise. The authors concluded that phosphatidylserine is effective in combating exercise-induced cortisol secretion and could prevent the physiological deterioration caused by elevated cortisol while improving the overall hormonal state. Similar to psychological stress, strenuous exercise can also induce an unwanted increase in cortisol and add to allostatic load.

Phosphatidylserine improves communication between cells in the brain by increasing the number of membrane receptor sites for receiving messages. Phosphatidylserine modulates the fluidity of cell membranes, essential to the brain cells' ability to send and receive chemical communication.

Stress increases the demand for phosphatidylserine. Supplementing with PS has been shown to reduce exercise-induced stress by blunting the increase of cortisol after intense exercise. PS can improve mood and relaxation in stressful situations and increase dopamine production, helping with depression. It enhances metabolism of glucose in the brain, improving neurotransmitter function. It increases the synthesis of acetylcholine, needed for memory, leading the FDA to state that phosphatidylserine may reduce the risk of cognitive dysfunction in the elderly. PS has also been recommended for treating ADD and ADHD in children and adults.

The adaptogen effect of phosphatidylserine appears to be multi-focal, including enhanced neurotransmitter release, which can moderate cortisol levels. By blunting the excess release of cortisol and sensitizing the feedback loop to the midbrain, there is less risk for allostatic load. Several studies have shown decreased cortisol response to mental stress and a dampening of the HPA axis. It has even been shown to improve perceived stress in golfers teeing off resulting in better ball flight.

Holy Basil

Holy Basil (*Ocimum sanctum* leaves) a botanical widely used in India for thousands of years for both medicinal and spiritual purposes, contains multiple compounds including ocimumosides and apigenin that have been shown to act as anti-stress substances. Several compounds were found to normalize blood sugar, cortisol levels and adrenal hypertrophy in an acute stress situation in animal studies. Through normalization of acute stress parameters, holy basil lowers chronic cortisol elevation in long-term stress and mal-adapted states.. Holy basil has also been found to have potent anti-oxidant effects in protecting against chemically induced oxidative stress.

Modern use of this Ayeurvedic herb includes treating asthma, allergic rhinitis, gastric ulcers, and digestive symptoms such as bloating. It has been used for mental fogginess, enhanced cerebral circulation and in certain types of depression. Studies have found a beneficial effect in Type 2 diabetes in normalizing blood sugar.

Rosemary

This well-known culinary spice also has significant effects as an herbal extract. It has an anti-inflammatory effect and is a powerful anti-oxidant, therefore reducing cortisol levels by decreasing the need for cortisol's effect as the body's anti-inflammatory hormone. In addition, rosemary has been found to improve brain fog, depression and low blood pressure.