

# Adrenal Complex



*For the rejuvenation of tired adrenal glands*

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Adrenal Complex is a glandular-based adrenal product, offering comprehensive support for overall adrenal and hypothalamic-pituitary-adrenal (HPA) axis function. The adrenal glands are mainly responsible for secreting cortisol and catecholamines (epinephrine and norepinephrine), the hormones involved in mediating stress responses. In addition to causing the depletion of a host of micronutrients, stress can alter levels of cortisol and catecholamines in a detrimental manner.

## **Cortisol**

Maintaining ideal levels of cortisol, referred to as the “stress hormone,” is critical to health. The adrenals secrete this hormone during the body’s “fight or flight” response to stress. Small increases of cortisol are often welcomed, such as those quick bursts of energy necessary in crisis situations for survival reasons, or in helping to maintain homeostasis in the body. However, higher than normal levels of cortisol for prolonged amounts of time, as seen with chronic stress, have been shown to have negative effects on the body. For example, cortisol increases serum blood glucose and insulin levels, inducing dysglycemia and laying the foundation for metabolic syndrome. Over time, elevated cortisol levels have detrimental repercussions on the adrenal glands, causing them to “burn out” so that they no longer can produce sufficient quantities of cortisol for the body to handle stress.

## **The HPA Axis**

The HPA axis is an interdependent, tightly-linked endocrine unit which makes up a major peripheral limb of the body’s stress system. The hypothalamus and pituitary form the central part of the HPA axis, whose main function is to control reactions to stress, maintaining stress-related homeostasis. It is the combined system of neuroendocrine units (the nervous and endocrine systems as they function together) which regulate the adrenal gland’s hormonal activities.

## **Why Include Glandulars?**

The inclusion of tissue-specific glandulars in Adrenal Complex from both, the adrenal cortex as well as the whole adrenal gland, adheres to the long-held theory that like heals like. In addition to being rich in an array of nutrients such as vitamins and minerals, these adrenal glandulars contain protein-like substances, which may have specific messenger activity that help target the body’s adrenal tissues to help strengthen and repair these glands.

With the ever-increasing concerns over the safety of glandular materials, we have re-examined this issue and have gone to extreme lengths to obtain the purest and cleanest sources of glandulars on the market today. Our glandular materials are obtained only from certified BSE-free countries (Argentina) and are freeze-dried to avoid rancidity.

## **Other Key Ingredients**

The amino acid n-acetyl-l-tyrosine, the most bioavailable form of tyrosine, is included as a critical building block of catecholamines (often depleted under chronic stress conditions). Research shows that supplementing with tyrosine may be useful therapeutically in people exposed to chronic stress. In a study which examined the effect of tyrosine on behavior induced by chronic stress in mice, tyrosine was shown to increase both the concentration and turnover rate of norepinephrine metabolites (*Kabuki Y, et al, Brain Res Bull, 2009*).

The inclusion of vitamin C is critical since it also plays an important role in cortisol levels. One particular study looked at the effect of vitamin C on cortisol in individuals subjected to stress-induced exercise. Saliva samples were collected from participants both, before and after cycling for two hours in a hot, humid environment. Results revealed a significant linear trend in post-exercise cortisol reduction in the vitamin C group, suggesting that vitamin C supplementation can decrease cortisol following exercise-heat stress (*Carrillo AE, Int J Sports Physiol Perform, 2008*).

Also included in Adrenal Complex are the family of B vitamins — thiamine HCL (B1), pantothenic acid (B5), pyridoxine-B6

(as P-5-P) and riboflavin-B2 (as R-5-P) — which play critical roles as enzyme cofactors in the balanced production of stress hormones. The B-vitamin profile is a comprehensive spectrum of Bs, most provided in their pre-activated phosphorylated form for superior bioavailability.

It is important to note pantothenic acid's role, in that it helps the adrenal glands to generate more cortisol when needed. In a study conducted on male rats, the adrenal cells in those given pantothenic acid exhibited higher basal levels of corticosterone than the control rats, demonstrating that pantothenic acid supplementation stimulates the ability of adrenal cells to secrete corticosterone (*Jaroenporn S, et al, Biol Pharm Bull, 2008*).

All of these ingredients are combined in order to synergistically promote proper homeostasis of serum cortisol, nurture healthy hypothalamic-pituitary function, aid in the production and replenishment of depleted catecholamines, support adrenal cortical health, and replete common nutritional deficiencies that can result from chronic stress. Taking Adrenal Complex during exposure to chronic stress may reduce stress-related side effects such as anxiety and weight gain in the midsection.

### Suggested Laboratory Studies

Abnormal salivary cortisol on the Adrenal Stress Test (Genova Diagnostics-Metamatrix Clinical Labs) and low catecholamine markers, such as VMA and HVA, found in the organic acid section of the Designs for Health Metabolic Profiles, may indicate the need for Adrenal Complex and/or Adrenotone™.

## Supplement Facts

Serving Size 2 capsules  
Servings Per Container 60

Amount Per Serving	% Daily Value	
Vitamin C (as Ascorbic Acid)	100 mg	170%
Thiamin (Vitamin B-1) (as Thiamine HCl)	2 mg	130%
Riboflavin (Vitamin B-2) (as Riboflavin-5-Phosphate)	5 mg	290%
Vitamin B-6 (as Pyridoxal-5-Phosphate)	5 mg	250%
Pantothenic Acid (as D-Calcium Pantothenate)	250 mg	2500%
Whole Adrenal Glandular	200 mg	*
PABA (Para-Aminobenzoic Acid)	100 mg	*
N-Acetyl-L-Tyrosine	50 mg	*
Adrenal Cortex Glandular	050 mg	*

\*Daily Value not established.

**Other Ingredients:** Microcrystalline cellulose, bovine gelatin (capsule), vegetable stearate.



### Recommended Use:

- As a dietary supplement, take two capsules per day with meals, or as directed by a health care practitioner.
- Consider combining with Adrenotone™ for comprehensive adrenal support.
- Use with caution with pregnant or lactating women, and with individuals on prescription medication, especially sulfa drugs.

### References

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6. Vitamin B6: a long known compound of surprising complexity. Mooney S, Leuendorf JE, Hendrickson C, Hellmann H. Molecules. 2009 Jan 12;14(1):329-51.
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9. Tyrosine prevents behavioral and neurochemical correlates of an acute stress in rats. Reinstein DK, Lehnert H, Scott NA, Wurtman RJ. Life Sci. 1984 Jun 4;34(23):2225-31.

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