

**Improves Stress Resilience*
**Supports Healthy Energy Levels*

**Strengthens the Body's Stress Response*
**Helps Maintain a Balanced Cortisol to DHEA ratio*

ENDOCRINE HEALTH

Licorice root extract is well-documented for its ability to strengthen the body's stress response and support healthy energy levels. The botanical extract contains a number of active compounds that promote hormone balance, boost immune function and support the body's resistance to fatigue. This liquid formulation of Licorice Root allows for flexible dosing throughout the day to accommodate a range of protocols.

Overview

High-stress lifestyles are known to push the stress response system into overdrive, often leading to a rise in levels of the hormone cortisol. While small amounts of cortisol are essential for health and survival, an overproduction of cortisol can ultimately cause the depletion of certain hormones and their precursors (including pregnenolone, DHEA and progesterone), along with a depleted production of cortisol itself, which can lead to low energy levels and fatigue. The structure of the active ingredient in licorice root is very similar to cortisol,¹ and helps to block the conversion of cortisol to the inactive cortisone, increasing the activity and half-life of cortisol.^{2,3} As a result, licorice is useful in protocols in which incremental increases in cortisol are desirable for better stress resilience and energy.¹

Hormone Health†

Glycyrrhizin and its metabolites are known to slow down enzymes, which convert cortisol to its inactive form; the similarity in structure of glycyrrhetic acid to that of cortisol accounts in part for the mineralocorticoid and glucocorticoid activity of licorice root.⁴ Licorice has also been found to promote

healthy levels of testosterone by blocking 17-hydroxysteroid dehydrogenase and 17-20 lyase, making it useful in protocols for supporting healthy testosterone balance.⁵

Immune Health†

Licorice constituents have also been found to support a normal inflammatory response. This is a result of its ability to inhibit phospholipase A2 activity, an enzyme important for promoting inflammatory balance.⁶ In vitro research has also shown licorice to inhibit cyclooxygenase activity and prostaglandin formation (specifically PGE2), as well as indirectly inhibiting platelet aggregation.^{6,7} Licorice has been shown to support immunity and to reduce oxidative stress in animals fed a high-fat diet.⁸ It has also been shown to enhance saliva IgA production and lower the expression of tumor necrosis factor- α messenger RNA.⁹

Directions

Take 1 drop per day or as recommended by your health care professional.

Does Not Contain

Gluten, corn, yeast, artificial colors and flavors.

Cautions

If you are pregnant, nursing or taking any medications for depression or anxiety, consult your health care provider before taking this product.

† These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.

Supplement Facts^{V1}

Serving Size 1 Drop (About 0.05 mL)
Servings Per Container About 1,200

1 drop contains	Amount Per Serving	% Daily Value
Licorice Root Extract	35 mg	*

*Daily Value not established

References

1. Heilmann, P., Heide, J. et al. Administration of glycyrrhetic acid: significant correlation between serum levels and the cortisol/cortisone-ratio in serum and urine. *Exp Clin Endocrinol Diabetes*. 1999; 107(6):370-378.
2. Krahenbuhl, S., Hasler, F. et al. Kinetics and dynamics of orally administered 18 betaglycyrrhetic acid in humans. *J Clin Endocrinol Metab*. 1994; 78(3):581-585.
3. Whorwood, C. B., Sheppard, M. C. et al. Licorice inhibits 11 beta-hydroxysteroid dehydrogenase messenger ribonucleic acid levels and potentiates glucocorticoid hormone action. *Endocrinology*. 1993; 132(6):2287-2292.
4. Armanini D, Karbowiak I, Funder JW. Affinity of liquorice derivatives for mineralocorticoid and glucocorticoid receptors. *Clin Endocrinol (Oxf)* 1983;19:609-612.
5. Armanini D, Mattarello MJ, Fiore C, Bonanni G, Scaroni C, Sartorato P, Palermo M. Licorice reduces serum testosterone in healthy women. *Steroids*. 2004 Oct-Nov;69(11-12):763-6.
6. Okimasu E, Moromizato Y, Watanabe S, et al. Inhibition of phospholipase A2 and platelet aggregation by glycyrrhizin, an antiinflammation drug. *Acta Med Okayama*. 1983;37:385-391.
7. Ohuchi K, Tsurufuji A. A study of the anti-inflammatory mechanism of glycyrrhizin. *Mino Med Rev*. 1982;27:188-193.
8. Hong YK, Wu HT, Ma T, Liu WJ, He XJ. Effects of Glycyrrhiza glabra polysaccharides on immune and antioxidant activities in high-fat mice. *Int J Biol Macromol*. 2009 Jul 1;45(1):61-4. *Epub* 2009 Apr 11.
9. Katayama M, Fukuda T, Okamura T, Suzuki E, Tamura K, Shimizu Y, Suda Y, Suzuki K. Effect of dietary addition of seaweed and licorice on the immune performance of pigs. *Anim Sci J*. 2011 Apr;82(2):274-81. *Epub* 2010 Dec 22.