

L-Theanine SAP

Science-based stress support*

Stress and anxiety are common in the modern world, but could become debilitating when exacerbated by lifestyle disorders, diseases and life situations. Conventional anxiolytic drugs have therapeutic potential, but not without side effects.* L-Theanine is a natural bioactive found in high amounts in certain tea species such as *Camellia sinensis*, which have been known for their medicinal properties in traditional medicine.* Its nootropic effects have been documented through clinical trials with promising results.* The major advantage of L-Theanine lies in its rapid absorption and ability to cross the blood brain barrier within 30 minutes of consumption, providing quick stress and anxiety relief.* Studies show that L-Theanine not only reduces anxiety but may also improve quality of sleep.* Furthermore, recent evidence supports the potential of L-Theanine in improving cognitive function, alertness and mental focus when challenged with mentally taxing cognitive tasks.* Studies also show that L-Theanine can help improve mood balance and reduce symptoms of depression.*

L-Theanine SAP provides a safe dose of L-Theanine for stress and anxiety relief and helps promote relaxation.*

ACTIVE INGREDIENTS

Serving Size: 1 Capsule	Amount Per Serving	Servings: 60 % Daily Value
L-Theanine	250 mg	**

** Daily value not yet established

Other ingredients: Magnesium stearate, silicon dioxide, microcrystalline cellulose in a capsule made of hypromellose and purified water

Contains no: Gluten, soy, wheat, corn, eggs, dairy, yeast, citrus, preservatives, artificial flavor or color, starch or sugar.

This product is non-GMO and vegan friendly.

L-Theanine SAP contains 60 capsules per bottle.

DIRECTIONS FOR USE

Adults: See indication specific dosages outline in the table.

Take 1 capsule per day or as directed by your healthcare practitioner.

INDICATIONS

L-Theanine SAP can help:

- Reduce anxiety and improve mood balance.*
- Enhance cognition and attention.*
- Improve quality of sleep.*
- Manage hypertension.*

Do not use if seal is broken. Keep out of reach of children.

PURITY, CLEANLINESS, AND STABILITY

All ingredients listed for each **L-Theanine SAP** lot number have been tested by an ISO 17025 accredited third-party laboratory for identity, potency, and purity.

*** 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.**

Scientific Advisory Panel (SAP):
adding nutraceutical research
to achieve optimum health



351, Rue Joseph-Carrier, Vaudreuil-Dorion, Quebec, J7V 5V5
T 1 866 510 3123 • F 1 866 510 3130 • nfh.ca

Anxiety is a common symptom of modern society, and affects people from all walks of life. Stress and lifestyle factors, and medical conditions such as metabolic syndrome, cancer and immune conditions can exacerbate symptoms of anxiety. Several drugs have been investigated and used in the treatment of stress and anxiety disorders, but these drugs are not without their own side effects and withdrawal symptoms. [1] This has prompted researchers to turn to natural ingredients and phytochemicals as a gentle and efficacious way of treating these disorders. L-Theanine is an amino acid naturally occurring in tea, especially species such as *Camellia sinensis*, where it makes up for 1-2% of the dry weight. It is known for its nootropic properties, and it can cross the blood-brain barrier within 30 minutes of consumption. [2] The unique advantage of L-Theanine consumption lies in its immediate action, where it is rapidly absorbed and hydrolyzed to ethylamine and glutamic acid at doses as low as 50 mg. [2, 3] L-Theanine can improve mental alertness and increase the *alpha* activity in the brain, which is typically associated with attention related processes. [3] This has triggered further research exploring the anxiolytic and alertness improving properties of L-Theanine.

Stress and Anxiety

The efficacy of L-Theanine at even low doses has been established through administration of tea infusions [2], but recent evidence shows a further pronounced impact on stress and anxiety, with administration of higher doses of L-Theanine. This was demonstrated in a cohort of 12 participants, where 200 mg L-Theanine was administered at the start and middle of a stress related task. The results indicated that L-Theanine could exert anti-stress effects by reducing cortical neuron excitation. [4] A larger experimental group has helped establish a clearer connection between L-Theanine and stress levels. In a randomized, placebo-controlled, crossover and double-blind trial, 30 participants were administered 200 mg/day of L-Theanine for 4 weeks. L-Theanine showed an improvement in stress, depression, anxiety and sleep scores, with a reduction in use of sleep medication. Participants also showed an improvement in verbal and letter fluency, indicating an improvement in cognition. [5] Efforts have been made to study these effects on improvement of lifestyle in patients suffering from mental disorders such as schizophrenia and schizoaffective disorder. In a randomized, double-blind, placebo-controlled study with 60 patients, 400 mg/day of L-Theanine was added to their antipsychotic treatment protocol. L-Theanine administration appeared to improve symptoms of anxiety, schizophrenia symptom severity and scores of general psychopathology, with no adverse events. [6] Another study attempted to understand the mechanism of action of this effect. In a study with 17 schizophrenic patients, administration of 250 mg/day of L-Theanine for 8 weeks showed significant improvements in the severity of schizophrenia symptoms and sleep quality. The results also suggest that L-Theanine helps balance glutamatergic dysfunction in the brain, a characteristic feature in the pathophysiology of schizophrenia. [7] These studies show the ability of L-Theanine to exert physiological benefits without interfering with drug treatment protocols. In fact, L-Theanine may present a natural and gentle alternative to anxiolytic drugs, thereby avoiding drug-drug interaction with conventional treatment protocols for other conditions. In a small double-blind, placebo-controlled experiment conducted with 16 participants, the acute effects of 1mg of anxiolytic alprazolam were compared with 200 mg of L-Theanine. L-Theanine was shown to exert anxiolytic effects in testing areas of the visual analog mood scale, where alprazolam did not. [8] These results need to be evaluated further to gather more substantial evidence.

Cognition and Mood

In addition to regulating stress, anxiety and sleep, recent research suggests that L-Theanine may enhance cognition and improve mood balance. A double-blind, placebo-controlled trial with 50 subjects showed improved attention, working memory and cognition after supplementation with 100.6 mg of L-Theanine for 12 weeks. [9] Another study looking at acute sensorimotor gating found that supplementation with 200-400 mg/day of L-Theanine increased sensorimotor gating, a mechanism by which excess trivial stimuli are filtered out, allowing the individual to focus on important aspects of their surroundings. [10] In addition to cognition, L-Theanine has a significant impact on mood. Administration of 250 mg/day of L-Theanine to 20 patients with major depressive disorder for 8 weeks showed reduced scores of depression and anxiety and improved cognitive functions, sleep

quality and verbal memory. [11]

Particularly with regards to cognitive performance and mood, several studies have looked at the effects of an L-Theanine and caffeine combination on mental abilities. A dose of 50 mg caffeine+100 mg L-Theanine/day in 27 participants showed that while caffeine alone improves alertness, a combination of the two appears to improve speed and accuracy of performance, with a reduction in incidence of distraction, underlining the importance of L-Theanine and caffeine in tasks that are demanding on cognitive function. [12] Another study showed that a dose of 97 mg L-Theanine+40 mg caffeine to 44 adults improved accuracy and alertness, and reduced levels of tiredness. [13] A higher dose of 200 mg L-Theanine+160 mg caffeine administered to 20 participants showed an improvement in visual recognition reaction time and other neurophysiological attention scores.

Higher dose of L-Theanine appeared to exert an effect similar to caffeine, and a combination of the two appeared to act synergistically to improve attention. [14] A smaller cohort was tested by the same research group, where 200 mg L-Theanine+160 mg caffeine was administered to 9 adults, followed by an MRI scan during task performance at 60 minutes. L-Theanine was associated with decreased response to distraction stimuli, with the results indicating that L-Theanine and caffeine have an additive effect in reducing mental distraction. [15] It must be noted however, that these results were acute effects, recorded 70-90 minutes from time of administration. Further studies must be conducted to see long term effects of L-Theanine on mood and cognition. The attention improving effects of L-Theanine and caffeine combination have been tested mostly in adults. One study however, has tested this combination in children (8-15 years) suffering from attention deficit hyperactivity disorder (ADHD). L-Theanine (2.5 mg/kg) + caffeine (2 mg/kg) appeared to improve total cognition, inhibitory control and reduce mind wandering. [16] Further studies are required to strengthen this evidence and test the therapeutic efficacy of L-Theanine and caffeine in treatment of ADHD.

Blood Pressure

The anxiolytic effects of L-Theanine may have other physiological implications, such as reduction of blood pressure. Fourteen participants were administered L-Theanine 200 mg + caffeine 100 mg and acute effects of this treatment were measured. L-Theanine reduced blood pressure spikes in the high response group subjected to a mental task. [17] These effects of L-Theanine on blood pressure of high stress response participants warrant further investigation.

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INDICATION SPECIFIC DOSAGE SUMMARY BASED ON HUMAN CLINICAL RESEARCH#

#Please note these suggestions are guidelines based on the clinical studies. Evidence for efficacy and safety have been qualitatively (study quality in terms of study design, sample size, appropriate methods of analysis, use of appropriate placebo/control, bias etc) assessed and have been rated using a 5 star ★ rating classification.

* 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.

Indication	Suggested L-Theanine SAP Dosage	Supporting Evidence and Study Outcomes	Study Design	Outcomes Measures/ Selection Criteria for Studies	Safety	Evidence Quality Rating
Stress and Anxiety						
Stress, anxiety, depression, sleep, cognition ¹	1 capsule/day for 4 weeks	Improvement in stress, depression, anxiety and sleep scores, reduced use of sleep medication, improved verbal and letter fluency*	Randomized, double-blind, placebo-controlled, crossover, n=30, 200 mg L-Theanine/day for 4 weeks	Self-rating Depression Scale, State-Trait Anxiety Inventory-trait, and Pittsburgh Sleep Quality Index (PSQI). Wilcoxon signed-rank test, Mann-Whitney U test, stratified analyses based on mean pretreatment scores, two tailed tests	No adverse events	★★★★★
Stress ²	1 capsule/day	Anti-stress effects pertaining to- Reduced heart rate, immunoglobulin levels, potential inhibition of cortical neuron excitation*	Randomized, double-blind, placebo-controlled, crossover acute study, n=12, 200 mg L-Theanine given at start and middle of stress task	Arithmetic task performed, Perceived stress and visual analog scale, State-Trait Anxiety Inventory (STAI), electrocardiogram, salivary secretory immunoglobulin A (s-IgA) levels	No adverse events	★★★★★
Anxiety ³	1 capsule/day	Mild anxiolytic effects in resting state, comparable or more than anxiolytic effects of alprazolam*	Randomized, double-blind, placebo-controlled, n=16. 200 mg L-Theanine, acute effects compared to 1mg alprazolam	Visual analog mood scale, state-trait anxiety inventory, Beck depression inventory-II, Beck anxiety inventory	No adverse events	★★★★★
Mood Disorders						
Depression and anxiety ⁴	1 capsule/day	Reduced scores of depression, anxiety. Improvement of cognitive function, sleep quality and verbal memory*	Open label study, n=20 (patients with major depressive disorder), 250 mg/day L-Theanine for 8 weeks	Hamilton Depression Rating Scale, State-Trait Anxiety Inventory, Pittsburgh Sleep Quality Index. Udvalg for Kliniske Undersøgelser for side effects. Stroop test, Brief Assessment of Cognition in Schizophrenia	No adverse effects	★★★

Anxiety in schizophrenia and schizoaffective disorders ⁵	2 capsules/day for 8 weeks	Improved symptoms of anxiety, schizophrenia severity and scores of general psychopathology*	Randomized, double-blind, placebo-controlled trial, n=60, 400 mg L-Theanine+ anti-psychotic protocol, for 8 weeks	Positive and Negative Syndrome Scale, Hamilton Anxiety Rating Scale, the Cambridge Neuropsychological Test Automated Battery for neurocognitive functioning	No adverse events	★★★★★
Schizophrenia ⁶	1 capsule/day for 8 weeks	Improvement of schizophrenia symptoms and sleep quality. Potential improvement of glutaminergic balance in brain*	Study with 17 schizophrenic patients, 250 mg L-Theanine/day for 8 weeks	Magnetic resonance spectroscopy, Positive and Negative Syndrome Scale, Pittsburgh Sleep Quality Index scores	No adverse events	★★

Cognition

Cognition in middle aged and older adults ⁷	1 capsule/day for 12 weeks	Improved reaction time to attention tasks, increased accuracy and reduced errors in task performance*	Randomized, double-blind, placebo-controlled, n=50, 100.6 mg/day L-Theanine for 12 weeks	Vital signs, Cognitrax test for cognition testing, hematologic tests, Mini-mental state examination, Japanese version, dementia biomarkers	No adverse effects	★★★★★
Sensorimotor gating for improvement of focus ⁸	1-2 capsules/day	Increased prepulse inhibition, increased sensorimotor gating, allowing for focus on important aspects*	Randomized, double-blind, placebo-controlled, n=14, 200-400 mg L-Theanine/day, acute effects studied	Prepulse inhibition tests, Startle reflex test unit, 35 trials of startle response conducted	No adverse effects	★★★★

Blood Pressure

Blood pressure ⁹	1 capsule/day	Inhibition of blood pressure rise in high response group, reduced tension-anxiety scores*	Randomized, placebo-controlled, crossover trial, n=14, 200 mg L-Theanine, acute study	Stress task assigned, cold pressure test. Profile of Mood States, Visual Analogue Scales, arterial pressure, skin temperature	No adverse effects	★★★★
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