



theTheanine®

**L-Theanine occurs naturally in green tea and black tea, and it is also available in supplement form with *BeTheanine*®, 100% extracted from Green tea using low ethanol process.**

*BeTheanine*® is an extract 100% from selected green tea, without any carrier or compounds other than from the extraction of green tea.

In order to comply with the extraction protocol recommended in Europe (low ethanol - 25%), a specific supply chain has been set up:

- precise selection of the collection area with traceability,
- definition of the level of leaf maturity
- suitable drying system to preserve the assay,
- Implementation of a selection protocol according to the active ingredient content
- improved extraction process

all this in order to maintain the optimum levels of L-Theanine in the green tea leaves, and to make it possible to obtain a rich extract without the risk of external intake, and in compliance with regulatory – and customer's – requirements.

### **Benefits**

Research shows that L-theanine can provide different health benefits, and improve mental focus and better sleep quality. Indeed, L-theanine may affect the levels of certain chemicals in the brain. These include serotonin and dopamine, which influence mood, sleep, and emotion, and cortisol, which helps the body deal with stress.

### **Grades**

*BeTheanine*® is standardized to 40% L-Theanine (by HPLC). Since no solvent for decaffeination or removal of compounds is used, *BeTheanine*® provides a little caffeine (max 1% presently). *BeTheanine*® is supplied in powder form. Certified Organic grades and higher L-Theanine are still under development.

## L-Theanine as a Functional Food bioactive

### Mental focus and Cognitive performance

The researchers found that people who took 100 milligrams (mg) of L-theanine made fewer errors in an attention task than those in the placebo group. Drinking 50 mg of caffeine or combining the L-theanine and caffeine also improved people's focus.

A 2016 meta-study concluded that this L-Theanine could benefit a person's mental and physical health, thanks to the neuroprotective effects, which improve brain function. On its own, L-theanine may improve a person's attention and reaction times. In combination with caffeine, it may lead to improvements in their number skills and alertness. L-Theanine also prevents the development of THC-induced behavioral aberrations.

### Improved sleep, Relaxation

Studies have suggested that L-theanine could help people relax before bedtime, get to sleep more easily, and

sleep more deeply, even when participants had generalized anxiety disorder and were taking antidepressants. The authors noted that there were no reported improvements in anxiety or insomnia severity. L-theanine may also contributed to the feeling of relaxation as it can lower the heart rate (help to reduce stress). In turn, this may help lower blood pressure.

### Immune System

Several studies have suggested that taking L-theanine could boost a person's immune system, making them less likely to get common colds or the flu. Its potential anti-inflammatory effects could also help fight illness. A pilot study, and a small clinical trial suggest that the enhancement of T lymphocytes may play a role in the observed decrease in cold and influenza symptoms.

Other researchers have evaluated effect of L-cystine and L-theanine on the immunologic response to vaccinations in the elderly and health care workers and to exercise in athletes, as well as in rats, and suggest an enhanced immunologic response.

### Reliable sourcing and process

Besides the specific production process, sourcing was essential in order to be able to offer a L-Theanine extract with the guarantee of a respectful process, without the addition of any external compound and while respecting the solvents and the PER in accordance with the regulations.

*BeTheanine*® is processed from leaves collected in a specific part of the chine mountainous region, in the majestic nature of Sichuan, Hunan and Hubei provinces ("*province of a thousand lakes*"), which is distinguished in particular by its excellent green teas, rich in trace elements and above all in selenium and theanine. Our research has shown how important the stage of leaf maturity and how it is dried is for preserving L-theanine.

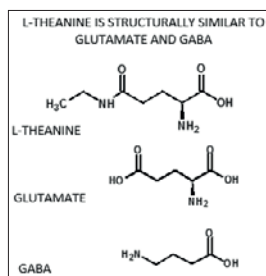
By implementing the various constraints observed, *BeTheanine*® is produced on a contract basis, in order to meet your technical and regulatory constraints.

### Digestion and metabolism : donor of glutamate to the body

As a structural analog of glutamate and glutamine, the theanine in preparations (teas, pure supplements, etc.) is absorbed in the small intestine after oral ingestion, where its hydrolysis to L-glutamate occur. Glutamate can be metabolized to glutamine in astrocytes.

### Pharmacodynamics

L-Theanine is structurally similar to the excitatory neurotransmitter



glutamate, and in accordance, binds to glutamate receptors. In addition, it inhibits glutamine transporters and glutamate transporters, and thus blocks the reuptake of glutamine and glutamate. L-Theanine increases serotonin, dopamine, GABA, and glycine levels in various areas of the brain, as well as BDNF and NGF levels in certain brain areas.

### Safety of L-Theanine

Theanine is sold in the US as a dietary supplement and has been granted GRAS (generally recognized as safe) status by FDA. In Energy drink, Health Canada does not consider the addition of L-Theanine to BECs up to 300 mg / day of each to be of concern. The median lethal dose (LD50) of L-theanine is suggested to be 5 g/kg bw. Mutagenicity and acute and subacute toxicity tests have failed to show toxicity. A toxicological study in rats showed no effect on behavior, morbidity, mortality, body weight, hematology, or urinalysis.

**Contraindications** : None well established.

**Dosing** : 45-200mg [EFSA 1104, 1117, 1222, 2004, 2005], L-theanine crosses the blood-brain barrier, with effects evident within 30 minutes and measurable up to 5 hours after administration.

### Mechanisms of action on the CNS

Several researchers have proposed a number of mechanisms by which it may act on the CNS. These include the inhibition of glutamate receptors, increasing the concentration of gamma-aminobutyric acid (GABA), increasing dopamine and serotonin in specific brain regions, inhibition of glutamate-induced effects including apoptosis and amyloid beta toxicity, hippocampal neurogenesis and enhanced memory, and neuroprotective blockage of multiple glutamate receptor subtypes in the hippocampus, suggesting a potential role in Parkinson and Alzheimer diseases.

The enantiomer L-Theanine, also known as L-γ-glutamylethylamide and N<sup>ε</sup>-ethyl-L-glutamine, is an amino acid analogue of the proteinogenic amino acids L-glutamate and L-glutamine and is found primarily in particular plant and fungal species. It was discovered as a constituent of green tea in 1949, and isolated in 1950. L-Theanine provides a unique brothy or savory flavor to green tea infusions. The human body does not produce L-Theanine.

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