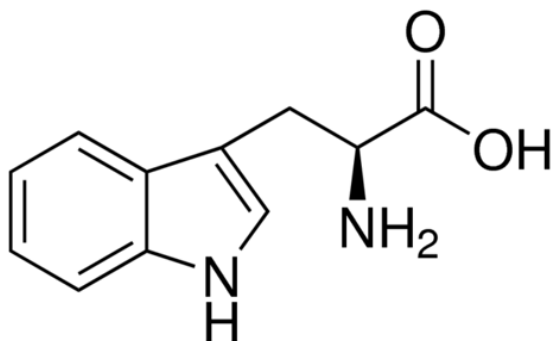


## L-Tryptophan 1000 mg

### TECHNICAL SUMMARY

Tryptophan is an essential amino acid; therefore, it is not synthesized by the body and must be obtained from the diet. In the brain, tryptophan is converted into serotonin, a neurotransmitter involved in feelings of well-being, calmness, personal security, and relaxation.\* It also plays a role in the regulation of appetite and synchronization of sleep patterns.\* Every lot of Protocol For Life Balance® L-Tryptophan is tested to be free of peak E and microbial contamination.

#### Structure Formula:



**Chemical Name:** 2-amino-3-indolpropanoic acid

**Allergen and Additive Disclosure:** Not manufactured with wheat, gluten, soy, milk, egg, fish, shellfish, or tree nut ingredients. Produced in a GMP facility that processes other ingredients containing these allergens.

**Delivery Form:** Tablets

### ROLE AS NUTRIENT/FUNCTION

As an essential amino acid, tryptophan's primary role is to be a protein component that can only be obtained through the diet or supplementation.\* Upon transport across the blood-brain barrier, this essential amino acid plays an important role in indirectly regulating other neurological pathways including sleep and mood.\* This regulation is accomplished through synthesis of indolamines responsible for maintaining these pathways including serotonin, melatonin, tryptamine, and nicotinamide. Regulation of the synthesis of these neurotransmitters contributes to the support of sleep and mood.\* Tryptophan also undergoes metabolism to kyurenine, which protects the eye from UV damage and has also been known to help support the normal aging process to the eye.\*

### NATUROKINETICS®

**Liberation:** Disintegration of the tablet is tested in water using a USP testing method with disintegration measured between zero and 30 minutes.

**Absorption:** Supplemental tryptophan is absorbed in the intestines via two distinct active transport mechanisms: Na<sup>+</sup>-dependent mechanism in the apical membrane of the gut and TAT1 transport located in the basolateral epithelium. Tryptophan absorption by the intestine is tightly regulated and

## Supplement Facts

Serving Size 1 Tablet

### Amount Per Serving

|   |                 |
|---|-----------------|
| L-Tryptophan (Free-Form)<br>(2-amino-3-indolylpropanoic acid) | 1 g (1,000 mg)* |
|---|-----------------|

\* Daily Value not established.

Other ingredients: Croscarmellose Sodium, Hydroxypropyl Cellulose, Stearic Acid (vegetable source), Magnesium Stearate (vegetable source), Vegetarian Coating and Silicon Dioxide.

- Encourages Positive Mood\*
- Supports Relaxation & Restful Sleep\*

**SUGGESTED USAGE:** Take 1 tablet 1 to 2 times daily on an empty stomach, with final dose at bedtime, or as directed by your healthcare practitioner.

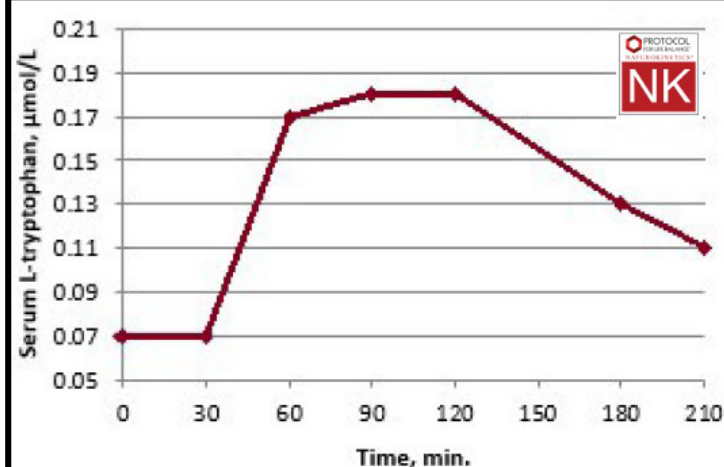


Figure 1. Mean serum concentrations following a single oral administration of L-tryptophan (0.8 g) in healthy adult volunteers.

influenced by its low affinity for its transport system and by competition with other amino acids. In a pharmacokinetic study with healthy volunteers, single oral administration of 0.8 g of L-tryptophan resulted in T<sub>max</sub> of 60-120 min (Figure 1).

**Distribution:** Approximately 75-95% of circulating tryptophan is bound to albumin. The non-bound, free tryptophan is available for transport across the blood-brain barrier. L-Tryptophan competes for transport across the blood-brain barrier with other large neutral amino acids (histidine, isoleucine, leucine, methionine, phenylalanine, threonine, tyrosine, and valine). Insulin regulates tryptophan's ability to cross the blood-brain barrier.

**Metabolism:** Once tryptophan has crossed the blood-brain barrier, there are two primary metabolic pathways that tryptophan undergoes. The majority of tryptophan, approximately 90%, is metabolized via the

\*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.

kynurenine pathway, which results in the formation of kynurenic acid (a glutamate receptor antagonist) and quinolinic acid (a glutamate receptor agonist). The second pathway is the indolamine formation of serotonin, nicotinamide, melatonin, and other tryptamines that are neurotransmitters that are pivotal in other neurological regulating pathways.\*

**Elimination:** Following ingestion, intact tryptophan urinary excretion is negligible. The major peripheral tryptophan metabolite kynurenine can be detected in urine 4 hours following administration of tryptophan. It is also subject to reabsorption by renal tubules.

### CLINICAL VALIDATION

- **Mood Support.\*** In a double-blind crossover study, participants were treated for 15 days with either 3 g/d of tryptophan or placebo. During this 15 day period, participants were asked to record their behavior, feelings, and perception of others during social interactions. Results showed a significant decrease in negative behaviors, feelings, and perceptions supporting the hypothesis that tryptophan can promote a more positive mood.\*
- **Sleep Support.\*** In a clinical trial with 15 volunteers expressing difficulties falling asleep (reported sleep onset latencies of over 30 minutes), tryptophan supplementation (1 g before bedtime) significantly reduced sleep latency from 26 min to 18 min.\*

### SAFETY INFORMATION

**Tolerability:** Tryptophan may cause occasional gastrointestinal discomfort such as heartburn and nausea and in rare cases, headache, lightheadedness, and drowsiness have been described.

**Contraindications:** Not recommended for women who are pregnant or nursing.

### INTERACTIONS

**Drug Interactions:** Combining selective serotonin reuptake inhibitors (SSRIs), monoamine oxidase inhibitors (MAOIs) and sedatives (clonazepam, lorazepam, phenobarbital, zolpidem) might increase the risk of serotonergic side effects.

**Supplement Interactions:** Theoretically, L-tryptophan might result in drowsiness when taken with valerian root, yerba mate, kava kava, and increase the serotonergic effect of 5-HTP, S-adenosylmethionine (SAME), and St. John's Wort.

**Interaction with Lab Tests:** Not known outside of EMS which is characterized by increase in eosinophil count and elevated liver enzymes.

### STORAGE

Store in a cool, dry place in original sealed container.