

## Tri-Amino™

### Support for healthy function of muscle and vascular systems

#### DESCRIPTION

Tri-Amino™, provided by Douglas Laboratories, includes significant amounts of the amino acids L-ornithine, L-arginine, and L-lysine.

#### FUNCTIONS

Amino acids have many functions in the body. They are the building blocks for all body proteins—structural proteins that build muscle, connective tissues, bones and other structures, and functional proteins in the form of thousands of metabolically active enzymes. Amino acids provide the body with the nitrogen that is essential for growth and maintenance of all tissues and structures. Aside from these general functions, individual amino acids also have specific functions in many aspects of human physiology and biochemistry. L-arginine is a conditionally essential dibasic amino acid. The body is usually capable of producing sufficient amounts of arginine, but in times of physical stress, endogenous synthesis is often inadequate to meet the increased demands. L-arginine can either be used for glucose synthesis or catabolized to produce energy via the tricarboxylic acid cycle. It is also the sole source of nitric oxide (NO), via the enzyme nitric oxide synthase. NO can affect a variety of physiological processes, including relaxation of arterial smooth muscle, platelet aggregation, and neuroendocrine secretion. L-arginine is required for the synthesis of creatine phosphate. Similar to adenosine triphosphate (ATP), creatine phosphate functions as a carrier of readily available energy for contractile work in muscles. Adequate reservoirs of creatine phosphate are necessary in muscle as an energy reserve for anaerobic activity. L-arginine is also a precursor of polyamines, including putrescine, spermine and spermidine. Spermine and spermidine interact with DNA, act as physiological growth regulators of cell proliferation, and are involved in the stabilization of cell membranes and cell organelles. L-arginine is a potent stimulator of insulin, glucagon, and growth hormone release, and functions as a representative signal to the endocrine system that dietary protein ingestion has taken place. Supplemental dietary L-ornithine can serve as a precursor of arginine. Both ornithine and arginine have anabolic effects in surgical trauma patients, and promote insulin as well as growth hormone secretion. Some scientists suggest that supplementation with these amino acids may improve functioning of the gastrointestinal tract, perhaps via increased secretion of bioactive polyamines. Lysine is required for collagen cross-linking. Collagen cross-linking is important for resiliency and elasticity of the collagen and elastin present in all connective tissues and blood vessel walls. During formation of new collagen, fibroblasts secrete immature collagen strands and a vitamin C- and copper-requiring enzyme, lysyl oxidase. Lysyl oxidase oxidizes the free amino group of the immature collagen's lysyl side chains. Once oxidized, these lysyl side chains spontaneously engage in various reactions between collagen strands to bring about cross-linking. As a result, a complex network of collagen strands is formed, providing elasticity and resiliency. Another important role of lysine is its precursor function for L-carnitine. L-carnitine is necessary for fatty acid metabolism and energy production in cardiac and skeletal muscle. It is involved in fatty acid oxidation as part of the carnitine shuttle. L-carnitine shuttles fatty acids from the cytosol (the cell fluid) into the mitochondria (the cell's powerhouses) for oxidation and energy production. Dietary lysine is present in the form of proteins, mainly from dairy and animal origin. Vegetarian diets tend to provide little lysine, because vegetable proteins, including legumes, are often low in lysine.

#### INDICATIONS

Tri-Amino™ capsules may be a useful dietary supplement for those who wish to supplement their diets with significant amounts of the bioactive amino acids L-ornithine, L-arginine, and L-lysine.

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**FORMULA (#7510)**

Four Capsules Contain:

L-Ornithine .....	900 mg
L-Arginine.....	1,200 mg
L-Lysine .....	1,200 mg

**SUGGESTED USE**

Adults take 4 capsules daily before bedtime or as directed by physician.

**SIDE EFFECTS**

No adverse side effects have been reported.

**STORAGE**

Store in a cool, dry place, away from direct light. Keep out of reach of children.

**Tri-Amino™****Support for healthy function of muscle and vascular systems****REFERENCES**

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**For more information on Tri-Amino™ visit [douglaslabs.com](http://douglaslabs.com)**

† 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.

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Your patients trust you.**