

L-Lysine

Free form essential amino acid



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Lysine is an essential amino acid necessary for healthy growth and tissue repair, and it serves a role in the normal production of antibodies, hormones, and enzymes.¹ Lysine is a precursor of L-carnitine, an amino acid derivative needed for the normal metabolism of fatty acids for energy production in the body. It is also involved in the formation of collagen, the substance critical for the health of bone and connective tissues including skin, tendons, and cartilage.¹ This product provides 1.5 g of free-form lysine in each two-capsule serving, meaning it is immediately available for absorption and can be put to metabolic use more readily and rapidly than the amino acids that are contained in dietary protein.*

Lysine is considered an essential amino acid, meaning it cannot be endogenously synthesized by the body and, thus, must be obtained through the diet and/or supplementation.¹ Failure to attain adequate amounts of this essential amino acid can result in a degradation of the body's proteins, including muscle. Unlike fats and carbohydrates, the human body does not store excess amino acids for later use; therefore, essential amino acids should be consumed every day for optimal health.

The primary sources of lysine are red meat, poultry, and fish, and certain plant-based protein sources such as tempeh, seitan, lentils, and various other legumes, nuts, and seeds. Consuming adequate amounts of this essential amino acid may be difficult for individuals with certain dietary restrictions such as vegetarians and vegans; lysine is the least abundant amino acid obtained through plant foods.² Athletes may also have a difficult time achieving proper levels of lysine and, thus, may require more than the current RDA of protein intake necessary to support metabolic adaptation, remodeling, repair, and protein turnover.^{3,4}

Energy Production and Immune System Balance

Lysine is one of the two precursors of L-carnitine, the amino acid derivative required for the transport of long-chain fatty acids into the mitochondria for β -oxidation⁵ and it assists in lowering cholesterol levels.⁶ In situations where L-carnitine is low, supplementation with lysine can help increase the body's production of L-carnitine, which will thereby assist with fatty acids being used more effectively for energy production.⁵ A deficiency in lysine can also affect the immune system homeostasis since it is involved in the production of antibodies; thus lysine supplementation may help to support healthy humoral immunity.

In an *in vivo* and *in vitro* study, the restriction of dietary lysine decreased IgG and IgM plasma concentration levels, two major serum immunoglobulins that aid in protecting the extravascular compartment against pathogenic viruses and microbes.⁷ Moreover, in the lysine-restricted group, the mRNA abundance of the pro-inflammatory cytokines, interleukin (IL)-6 and IL-8, in the kidney and spleen were significantly higher, and there was a significant decrease in anti-inflammatory cytokines, IL-4 and IL-10, and their expression of compared with the control group.⁷ These results showed that lysine restriction, or the inadequate intake of this essential amino acid, may significantly influence the inflammatory and immune response via mediating serum antibody, cytokine, and toll-receptor concentrations.⁷

Another *in vitro* model found that a combination of supplemental lysine and DHA and a caloric-restricted diet ameliorated non-alcoholic fatty liver disease (NAFLD) in mice, and that lysine alone showed a reduction in lipid accumulation in the liver and enhanced weight loss.⁶ The study found that 4 mM of lysine supplementation reduced IL-6 mRNA expression, linking increased lysine to decreased hepatic inflammation.⁶

According to cell culture studies, the balance of lysine to arginine in the body influences herpes simplex virus (HSV) expression, in that lysine competitively inhibits the synthesis of proteins used in the virus's reproduction.⁸ A literature review of oral L-lysine supplementation for preventing HSV recurrence showed that doses of 3 g per day or more of L-lysine improved patients' subjective experience of the disease, but that doses less than 1 g/d were ineffective for prophylactic treatment of HSV lesions.⁸

Lysine may be useful for:*

- Supporting the immune system
- Regulating inflammatory cytokine production
- Vegans and vegetarians with inadequate dietary protein intake
- Energy production
- Bone, muscle, and cartilage support
- Healthy growth and tissue repair
- Production of antibodies, hormones, and enzymes

Supplement Facts

Serving Size 2 capsules
Servings Per Container 60

Amount Per Serving	% Daily Value
L-Lysine HCl	1.5 g *

*Daily Value not established.

Other Ingredients: Cellulose (capsule), vegetable stearate.

Recommended Use:

- As a dietary supplement, take two capsules per day, or as directed by your health care practitioner.

For a list of references cited in this document, please visit:

http://catalog.designsforhealth.com/assets/itemresources/L_Lysine_References.pdf

*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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