L-Lysine SAP

*Science-based amino acid for antiviral activity**

Lysine is classified as being an essential amino acid for human health.* This means that lysine cannot be synthesized from other amino acids in the body and has to be consumed in adequate amount in the diet.* Lysine is found in highest concentrations in animal protein sources, such as meat and dairy;[1] lower amounts are found in proteins from grain products, such as corn and wheat.*[1] Lysine is required by the body for many functions, including the synthesis of various connective tissues such as skin, collagen, elastin, and bone.* Lysine is also required for the synthesis of carnitine, a nonessential amino acid that assists in the conversion of fatty acids to energy.* This is an important function for the health of the immune system, and especially important for antiviral activity.* This is one of the reasons that lysine has benefit in treating the herpes simplex virus(HSV) infections also known as cold sores.*[1] Lysine has also been shown to help absorb calcium and decreases the amount of calcium excreted in the urine.*[2]

SUPPLEMENT FACTS

Serving Size: 2 Capsules — **Servings:** 45

	Amount Per Serving	% Daily Value
L-Lysine (from L-lysine hydrochloride)	1000 mg	**

**Daily Value not established

This product is non-GMO and vegan friendly.

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

L-Lysine SAP contains 90 capsules per bottle.

DIRECTIONS FOR USE

Adults: Take 2 capsules one to three times daily or as directed by your healthcare practitioner. Consult a healthcare practitioner for use beyond 6 months.

INDICATION

L-Lysine SAP may aid in the prevention of bone loss, as it increases calcium absorption and reduces calcium excretion,* and can be used:

- As a preventative treatment for patients with recurrent herpes simplex infections.*
- To treat herpes simplex infections to reduce the duration of the outbreak.*

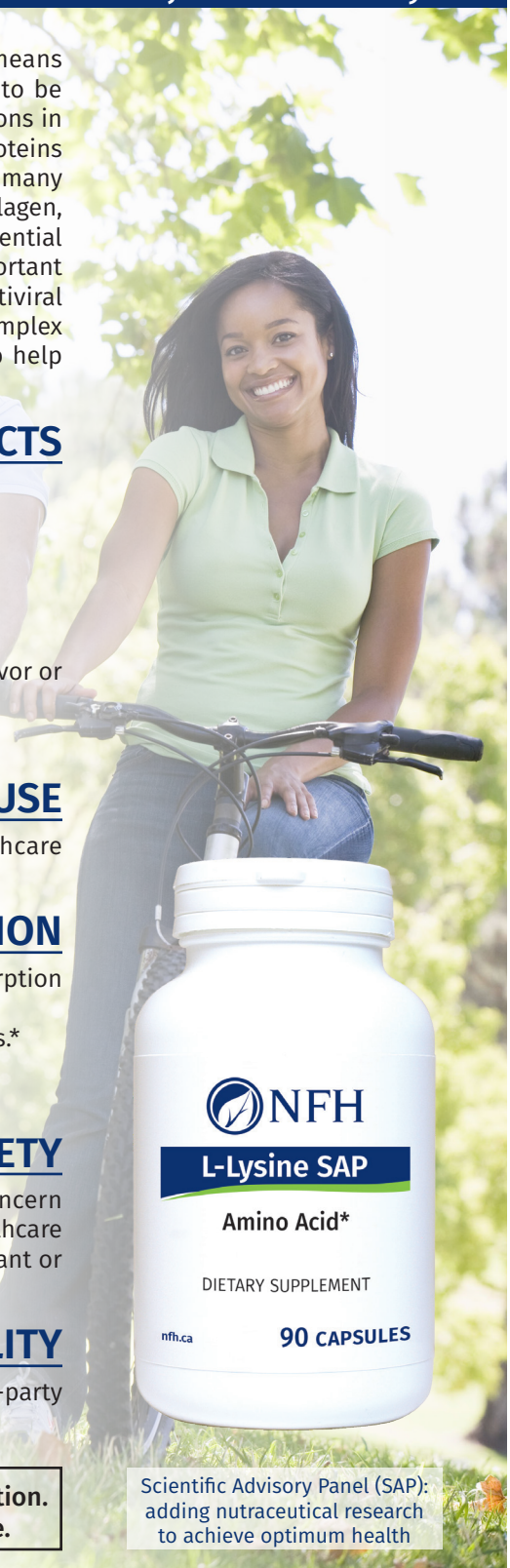
SAFETY

Lysine in the diet is considered safe. Patients with kidney or liver function concern should speak with their healthcare practitioner before taking lysine. Consult a healthcare practitioner prior to use if you are following a low protein diet; or if you are pregnant or breast-feeding.

PURITY, CLEANLINESS, AND STABILITY

All ingredients listed for all **L-Lysine SAP** lot numbers have been tested by a 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.**



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Lysine is an essential amino acid for humans. It must be obtained via food sources like dairy products, meats, and beans. Lysine is involved in several important functions in the body, including the synthesis of various connective tissues such as bone, skin, collagen, and elastin. Lysine is often deficient in athletes and patients eating a vegan-based diet low in legumes.[3] Deficiency may manifest as fatigue, nausea, dizziness, agitation, slow growth, and reproductive disorders.[3]

L-LYSINE BIOCHEMISTRY

After ingestion, lysine is absorbed via active transportation from the small intestine and travels to the liver via portal circulation.[1] In the liver, lysine combines with other amino acids to enable protein synthesis. Catabolism of lysine also occurs in the liver, where it eventually becomes acetoacetyl-CoA. Lysine is both glycogenic and ketogenic, and therefore can lead to the formation of glycogen, D-glucose, as well as lipids.[1] Human absorption studies have found that lysine supplements absorb at a similar rate to lysine in dietary sources, therefore suggesting that supplementation is an effective means of increasing lysine in the body.[1]

L-LYSINE AND *HERPES SIMPLEX*

Several clinical trials have explored the efficacy of lysine in the treatment and prevention of recurrent HSV infections. In one double-blind, placebo-controlled study, a treatment group was given 1,000 mg of L-lysine three times a day for a period of six months; the control group was given a placebo.[4] The subjects who were taking L-lysine had an average of 2.4× less HSV infections, and the infections that did occur had a statistically significant reduction in severity and healing time.[4]

A 6-month survey study involving 1,543 subjects was conducted to test the effect of lysine supplementation on herpes infections. Subjects took an average dose of 936 mg/d of lysine, and 84% reported that lysine supplementation prevented recurrence or decreased the frequency of herpes infections.[5] 79% of subjects without lysine reported that their symptoms had been intolerable, compared to only 8% of subjects taking lysine.[5] Healing time was reported as taking <5 d in 83% of subjects taking lysine, whereas 90% of subjects not using lysine reported a healing time of 6–15 d. The overall findings of this study reported that 88% of participants considered lysine supplementation an effective treatment for herpes infections.[5]

There have also been studies exploring the use of L-lysine for the treatment of recurrent *Herpes labialis*. In a study that looked at the efficacy of long-term prophylactic lysine supplementation in women, subjects with a history of recurring herpetic lesions took 1,000 mg/d of lysine or placebo for 12 months with a crossover after 6 months.[6] The serum levels of lysine were measured, and in women who were found to have a concentration higher than 165 nmol/ml, there was a corresponding significant decrease in recurrence rate. As concentration levels fell below 165 nmol/ml, the frequency of infections increased.[6] This demonstrates that if serum levels of lysine can be maintained with prophylactics, this may result in a reduction in reoccurrence of herpetic lesions.

L-LYSINE AND BONE LOSS

It has been well-documented that calcium deficiency contributes to bone loss over time. Studies in both humans and animals have demonstrated that the dietary supplement L-lysine can increase calcium absorption.[2] In a study performed in women with osteoporosis compared to a healthy control group, an oral load of 3 g of calcium was given with or without 400 mg of L-lysine.[2] In all women, there was a progressive increase in serum calcium followed by a progressive increase in urinary calcium excretion, except in the L-lysine treated healthy subjects who demonstrated a blunted calciuric response.[2] Researchers then tested the effect of supplemental L-lysine, L-valine or L-tryptophan (800 mg/d) on calcium absorption in 45 osteoporotic patients. L-Lysine, but not L-valine or L-tryptophan, significantly increased the intestinal absorption of calcium. The results of these studies suggest that L-lysine can enhance absorption and improve the renal conservation of calcium, which indicates its potential usefulness as a preventative and therapeutic treatment for osteoporosis.[2]

SAFETY AND PRECAUTIONS

Research conducted using supplements of L-lysine in humans have reported no adverse side effects when using this supplement.[7] A study performed on rats looking at the toxicity profile of L-lysine found there was no functional, biochemical, or histological changes in renal function.[8] The study concluded that the no-observed-adverse-effect level (NOAEL) for L-lysine is estimated at 5.0% for both genders (male, 3.36 ± 0.12 g/kg/d; female, 3.99 ± 0.28 g/kg/d).[8] Arginine and lysine are amino acids that use a common pathway in the body, so a high concentration of arginine may theoretically lower levels of lysine in the body.[3]

REFERENCES

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