Doctor's BEST® Science-Based Nutrition™

Best Alpha Lipoic Acid

Best Alpha Lipoic Acid 600

60 Veggie Capsules 600mg

Ingredients per vegetarian capsule:

Alpha lipoic acid .....600 mg

Excipients: modified cellulose (veggie cap), magnesium silicate, silicon dioxide, rice powder.

Suggested Adult Use: Take one or two capsules daily with or without food.

SUITABLE FOR VEGETARIANS

Best Stabilized R-Lipoic Acid featuring BioEnhanced™ Na-RALA

60 Veggie Capsules 100mg

Ingredients per vegetarian capsule:

D-Biotin .....150 mcg

R-Lipoic acid .....100 mg

(from 143mg Sodium R-alpha Lipoate (BioEnhanced™ Na-RALA))

Excipients: Modified cellulose (vegatarian capsule), rice powder, microcrystalline cellulose, sodium bicarbonate, magnesium stearate (vegetabel source), and silicon dioxide.

Suggested Adult Use: Take one to two capsules daily. Take with or without food.

SUITABLE FOR VEGETARIANS

Best Alpha Lipoic Acid

120 Capsules 150mg - ***NOT vegetarian***

Ingredients per capsule:

Alpha lipoic acid .....150 mg

Excipients: cellulose, magnesium stearate (vegetable source), gelatin capsule.

Suggested Adult Use: One to six capsules daily with or without food.

NOT SUITABLE FOR VEGETARIANS

Ingredients

Effects of Lipoic Acid

Alpha-lipoic acid (ALA) is a sulfur-containing fatty acid that performs vitamin-like roles in the body. Also known as "lipoic acid" or "thioctic acid," ALA functions, in a similar way to B complex vitamins, as a co-enzyme in the metabolism of carbohydrates that produces energy inside cells for the body's metabolic needs. ALA is required for synthesis of "acetyl CoA," a key metabolite in the cellular process that turns glucose (blood sugar) into energy. Because the body produces ALA on its own, it is not classified as a true vitamin. As with other so-called "non-essential" nutrients, however, internal ALA production may not always be optimal. Alpha-lipoic acid functions as both a water–soluble and fat–soluble antioxidant. (Antioxidants neutralize free-radicals, normal by-products of metabolism that, while necessary at normal levels, may damage tissues over time if not properly kept in check by antioxidants.) ALA's ability to act upon free radicals in both a watery and fatty environment makes it a highly versatile antioxidant. In the body, alpha-lipoic acid can be converted (reduced) to DHLA, or dihydrolipoic acid. (It is not necessary to take DHLA as a supplement; the conversion of ALA to DHLA occurs as a normal biochemical process in the system). Together, these two forms of ALA make up a "redox couple," which means that each form can chemically change into the other and back again. DHLA also functions as an antioxidant.

What is BioEnhanced™ Na-RALA Stabilized R-Lipoic Acid?

Best Stabilized R-Lipoic Acid contains BioEnhanced™ Na-RALA, the sodium salt of R-Lipoic acid (RLA). Pure RLA is a very unstable molecule that has a tendency to polymerize with exposure to heat, light and moisture. RLA is also hygroscopic, or water-seeking. This presents problems for those wishing to supplement with RLA. Any of these conditions can lead to deactivation of the beneficial activity of lipoic acid. Unlike pure RLA, BioEnhanced™ Na-RALA is a stabilized form of RLA that won't degrade at high temperatures, is more bioavailable than regular RLA and has no solvent residues.

Lipoic acid (LA) plays an important role in glucose metabolism and energy production. Because it is soluble in both water and fat, LA is known as the "ideal antioxidant." LA occurs in two forms, designated as "R" and "S." Studies suggest that RLA, the natural form, is more biologically active than the S form.

R-Lipoic Acid is chemically considered to be a weak acid. A principle of pharmacology is that salts of weak acids have a much higher solubility in water than the weak acid on its own.[1] Supplementing with the sodium salt of RLA increases its solubility and improves its dissolution in the body. This is the principle upon which BioEnhanced™ Na-RALA was founded.

Note: The RLA in this product is stabilized with Na (sodium). However, one serving of this product contains less than 1% of the Daily Value for sodium, an insignificant contribution to dietary sources. Research suggests that sodium may impact blood pressure in some individuals only when it is consumed as sodium chloride (NaCl, table salt) and not in other forms. The sodium in this product is unlikely to affect blood pressure levels.

Benefits

- Supports the Body's Defense Against Free Radicals*
- Recycles Antioxidant Nutrients such as Vitamin C and Vitamin E*
- Helps Maintain a Healthy Blood Sugar Level when used as part of the diet*

Alpha-lipoic Acid: The "Ideal Antioxidant"

The antioxidant potential of a substance is based on a number of criteria, including:

1) Ability to quench specific free-radicals.
2) Ability to bind or "chelate" metal ions that can generate free radicals.
3) Supports function of other antioxidants.
4) Absorption/bioavailability.
5) Concentration in tissues, cells and extra cellular fluids.
6) Ability to function as an antioxidant in fatty and watery environments.

The "ideal antioxidant" would meet all the above criteria. Very few antioxidants do, yet a particular antioxidant with but a few of these characteristics is still valuable and effective. Vitamin E, for example, is one of the most important dietary antioxidants, yet it only works in fatty environments such as cell membranes.

As a team, ALA and DHLA come close to the ideal, for the following reasons[1,2,3]

1) ALA is easily absorbed when consumed orally.
2) ALA is readily converted to DHLA in various tissues.
3) As a pair, ALA and DHLA neutralize superoxide, hydroxyl, peroxyl, and hypochlorus radicals.
4) ALA and DHLA form stable complexes with metalions such as iron, manganese, copper and zinc ions.
5) ALA and DHLA scavenge free radicals in fatty environments and watery environments.
6) DHLA recycles other important antioxidants.

DHLA-Regenerates vitamin C, vitamin E and Glutathione.

Within the cell, antioxidants work as a team to keep free radicals from damaging cell structures. In order to neutralize a free radical, an antioxidant such as vitamin C must give up an electron, which means it becomes oxidized. Before it can function as an antioxidant once again, it must be regenerated back to its "reduced" form, by gaining an electron to replace the donated electron. For this, it needs the help of other antioxidants. Vitamin C, vitamin E and glutathione are key antioxidants that can be generated by cycling between their oxidized and reduced forms. This is necessary to maintain the balance between oxidation and its reverse––the neutralization of free radicals by antioxidants.

DHLA is an essential component in the interaction between these antioxidants.[4] Studies show that addition of alpha-lipoic acid to liver tissues results in increased vitamin C levels. It has been found that DHLA is responsible for regenerating vitamin C, which in turn regenerates vitamin E.[3]

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DHLA also converts glutathione from its oxidized form back into its free radical scavenging reduced form.[3,5] The ALA/DHLA pair is thus vital for prevention of "oxidative stress," which occurs when the balance is tipped in favor of oxidation in cells.[4] DHLA helps preserve antioxidants in both the watery cell interior and the fatty structure of cell membranes.[6] Evidence from animal studies suggests that DHLA protects the brain against free radical damage.[7]

Alpha-lipoic Acid and Blood Sugar

Alpha-lipoic acid is a key factor in the cellular process that metabolizes glucose to produce energy for cellular functions. The importance of ALA's role in blood sugar metabolism is evidenced in studies on ALA and type-2 diabetes. In a small pilot study, thirteen people with type-2 diabetes showed improved utilization of glucose in muscle tissue in response to intravenous administration of ALA.[8] In a four week controlled multicenter trial, 74 people with type-2 diabetes took ALA in oral doses of 600, 1200 or 1800 mg per day. After 4 weeks, the normal lowering of blood sugar levels in response to insulin improved.[9] In vitro studies have shown that ALA has a positive effect on insulin-stimulated uptake of glucose by muscle cells.[10]

R-Lipoic Acid

Alpha lipoic acid comes in two forms, designated as 'R-lipoic acid' and 'S-lipoic acid.' R- and S-lipoic acid are isomers–compounds containing the same atoms with a different arrangement of those atoms in space. R- and S-lipoic acid are optical mirror-images of each other; isomers with this characteristic are called 'enantiomers.' R-lipoic acid is naturally synthesized by humans, animals and plants. S-lipoic acid is formed during chemical synthesis of alpha lipoic acid, which produces a mixture of the two enantiomers containing equal parts of each. This 'racemic' mixture is the product used in human clinical studies on alpha lipoic acid.

Alpha lipoic acid is rapidly absorbed into systemic circulation. Preliminary pharmacokinetic studies have shown that R-lipoic acid reaches higher serum levels than the S- form. Following single oral doses of 50 to 600 mg maximum serum levels of the R- form were 40 to 50% higher than S-lipoic acid.[11]

In vitro and animal studies have compared the effects of the two alpha lipoic acid isomers. In many cases the naturally occurring R-lipoic acid has shown greater potency than the S- form. For example, R-lipoic acid and the racemic mixture both decreased cataract formation, induced by the toxin buthionine sulfoximine (BSO), in rats, while S-lipoic acid alone had no effect.[12] In an in vitro study, brain cells from newborn rats were exposed to two toxins that inhibit synthesis of glutathione, resulting in neuronal degeneration via oxidative stress. Both R- and S-lipoic acid protected cells against oxidative neurotoxicity induced by homocystic acid (HCA). Only R-lipoic acid protected cells against prolonged exposure to BSO.[13]

The comparative effects of R- and S- lipoic acid on glucose metabolism in insulin-resistant skeletal muscle of rats have also been studied. Zucker obese rats were injected intraperitoneally with either the R- or the S- enantiomers. R- lipoic acid increased insulin-mediated glucose uptake into skeletal muscle, whereas S-lipoic acid had no effect. Additionally, R-lipoic acid stimulated glucose oxidation and glycogen synthesis, whereas S-lipoic acid, again, was without effect. Moreover, R-lipoic acid reduced plasma insulin levels, while S-lipoic acid actually increased plasma insulin by 15%. These findings suggest R-lipoic acid alone helps normalize blood glucose in insulin-resistance subjects, although this has yet to be confirmed in humans.[14] On the other hand, another study found R- and S-lipoic acid equally effective in improving nerve function and neural blood flow in diabetic rats.[15]

Other studies have found R- and S- lipoic acid equally potent as an antioxidant. For example, both R- and S- inhibited lipid peroxidation in rat brain and nerve tissues in an in vitro experiment, with no observed difference between the two enantiomers. Noting that S-lipoic acid has different stereo specificity than R-toward endogenous antioxidant enzymes, the researchers postulate that S-lipoic acid "may have a useful role as an antioxidant for mammalian systems, by extending the range of antioxidant properties of (alpha) lipoic acid."[16] In another investigation, the middle cerebral artery (MCA) of anesthetized rats was blocked, creating local ischemia (lack of oxygen) in the brain. Both R- and S-lipoic acid, protected against ischemic damage when injected subcutaneously prior to occlusion of the MCA. When administered 1-2 hours prior to occlusion, the two enantiomers demonstrated similar neuroprotective potency. Upon administration 4 hours prior, only S-lipoic acid reduced the extent of tissue damage, (the "infarct volume") compared to controls. At six hours prior, neither R- nor S- had any effect.[17]

Aging is accompanied by a decreased ability of the liver to recycle ascorbic acid following oxidative stress. R-lipoic acid, after two weeks of supplementation to aged rats, reversed the age-related impairment of ascorbic acid recycling and concentration in liver cells.[18] A second study confirmed these results. Researchers determined that an RLA-supplemented diet fed to old rats for two weeks resulted in improved mitochondrial function, decreased free radical damage and increased metabolic rate. Whereas a significant decline was seen in ascorbic acid and glutathione levels in the livers of the control rats, the RLA supplemented group showed no decline in the levels of these critical antioxidants.[19]

Safety

Alpha-lipoic acid is considered safe, and no adverse effects have been seen with long-term supplementation.[1]

*This statement has not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease.

Scientific References

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Best Stabilized R-Lipoic Acid contains BioEnhanced™ Na-RALA, the sodium salt of R-Lipoic acid (RLA). Unlike pure RLA, BioEnhanced™ Na-RALA is a stabilized form of RLA that won't degrade at high temperatures, is more bioavailable than regular RLA and has no solvent residues.

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Doctor's BEST®

Science-Based Nutrition™

Dietary Supplement

Featuring **BioEnhanced™ Na-RALA**

Best Stabilized R-Lipoic Acid

*DEFENDS AGAINST FREE RADICALS**
*RECYCLES THE ANTIOXIDANT VITAMINS C & E**
*MAINTAINS A HEALTHY BLOOD SUGAR LEVEL AS PART OF THE DIET**

100 mg / 60 Veggie Caps

Supplement Facts

Serving Size 1 capsule
Servings per container 60 servings

	Amount per serving	% Daily Value**
D-Biotin	150 mcg	50%
R-Lipoic acid (from 143mg Sodium R-alpha Lipoate (BioEnhanced™Na-RALA))	100 mg	†

** % Daily Values are based on a 2,000 calorie diet
† Daily Value not established.

Other ingredients: Modified cellulose (vegetarian capsule), rice powder, microcrystalline cellulose, sodium bicarbonate, magnesium stearate (vegetable source), and silicon dioxide.

Suggested adult use: One to two capsules daily, or as directed by a health care professional.

Suitable for vegetarians
CONTAINS NOTHING OTHER THAN LISTED INGREDIENTS

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