L-ARGININE – CREATIN & CELLULAR ENERGY

Arginine increases blood glucose after exercise

Arginine improves glucose utilisation in patients

Arginine improves blood sugar disposal in patients.

Arginine increases lung oxygen uptake in mountain dwellers.

L-ARGININE – NITRIC OXIDE & COGNITION

Creatine improves cognitive function in vegetarian subjects.

Arginine improves cognitive function of demented patients

Nitric oxide regulates neuronal signal transmission.

Arginine may be useful in dementia

Arginine facilitates long-term memory

Arginine improves memory and cognition.
<table>
<thead>
<tr>
<th>Reference</th>
<th>Summary</th>
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<tbody>
<tr>
<td>Wenzel P et al. Role of reduced lipoic acid in redox regulation of mitochondrial aldehyde dehydrogenase (ALDH-2) activity.</td>
<td>Lipolic acid prevents nitric oxide tolerance in patients.</td>
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<tr>
<td>Nagamatsu M et al. Lipoic acid improves nerve blood flow, reduces oxidative stress, and improves distal nerve conduction in experimental neuropathy. Diabetes Care 18 (8), 1160-1167, 1995</td>
<td>Lipolic acid improves microcirculation along peripheral nerves.</td>
</tr>
</tbody>
</table>
DeMarco V et al. Lipoic acid decreases exhaled nitric oxide concentrations in anesthetized endotomoxic rats. Vascular Pharmacology 43 (6), 404-410, 2005


**RLA – ATP & CELLULAR ENERGY**


Lipoic acid increases glucose entry in cells in diabetic patients.


Lipoic acid increases glucose entry in cells in diabetic patients.


Lipoic acid increases glucose entry in cells in diabetic patients.


Lipoic acid improves glucose entry in cells and glucose oxidation and mimics the effect of physical exercise.


Lipoic acid increases ATP in the brain and in muscles of patients.


Lipoic acid increases ATP in the muscle patients.


Hagen T M et al. Feeding acetyl-L-carnitine and lipoic acid to old rats significantly improves metabolic function while decreasing oxidative stress. PNAS 99 (4), 1870-1875, 2002

Hagen T M et al. R-alpha-lipoic acid supplemented old rats have improved mitochondrial function, decreased oxidative damage, and increased metabolic rate. Fseb J 13, 411-118, 1999


Lipoic acid increases cellular glucose uptake and serum carnitine in patients.

Lipoic acid improves cellular glucose oxidation, physical and mental activity in patients.

Lipoic acid improves cellular glucose oxidation, physical and mental activity in patients.

Lipoic acid improves cellular glucose oxidation and clinical condition in patients.

Lipoic acid improves cellular glucose oxidation in healthy volunteers.

Lipoic acid alone and in combination with acetylcarnitine improves mitochondrial function and physical activity.

R(+) alpha-lipoic acid increases cellular energy supply

Lipoic acid improves ATP the synthesis system in nerves.

R(+)hioic acid improves glucose uptake and glucose oxidation in the muscle.

Reed LJ. A trail of research from lipoic acid to alpha-keto acid dehydrogenase complexes. The Journal of Biochemistry, 276 (42), 38329-38336, 2001

R(+)-alpha-lipoic acid and exercise stimulate glucose metabolism in the muscle

R(+)-alpha-lipoic acid is a central cofactor for cellular glucose oxidation and cellular energy supply.

**RLA – ACETYLCHOLINE & COGNITION**


Lipoic acid improves cognitive function in patients.


Lipoic acid improves cognitive function and activities of daily living in patients.

Stoll S et al. The potent free radical scavenger alpha-lipoic acid improves cognition in aged mice; putative relationship to NMDA receptor deficits.

Lipoic acid improves cognitive function.


Lipoic acid improves cognitive function.


Lipoic acid alone and in combination with acetyl carnitine improves memory function.


Lipoic acid boosts neurotrophic support.

Haugaard N, Levin RM. Activation of choline acetyl transferase by dihydrolipoic acid. Molecular and Cellular Biochemistry 229, 103-106, 2002

Lipoic acid stimulates the neurotransmitter acetylcholine synthesis.