

Lithium

Facts:

- ◆ The lightest of all minerals, lithium (Li) has a density half that of water. It is distributed throughout the Earth's crust. It can vary between 1.2 parts per million (ppm) in light organic soils to 98 ppm in alluvial soils.¹
- ◆ Although not proven essential yet, there is growing evidence that lithium plays a number of roles within the human body.
- ◆ The average daily intake of Li has been estimated to vary between 10 mcg to 2 mg per day. The average output in humans per day is estimated in the range of 200 to 800 mcg.

Functions:

- ◆ Involved in the respiration of nuclear membranes at the intracellular level, uptake of glucose into cells, may improve fertility, aids in treating sodium imbalances in atherosclerosis, hypertension, mental disorders and aggression.
- ◆ Lithium is primarily known for its role as a pharmacological mood-regulating agent.
- ◆ According to Alexander Schauss, Ph.D., "Other evidence finds that Li is incorporated into bone at a rate directly proportional to the rate of bone growth, probably owing to the physicochemical similarities between Li, calcium and magnesium."¹

Requirements:

No RDAs have been established; the average daily intake is estimated to be between 10 mcg to 2 mg.

Signs of Deficiency:

In animals studies, specifically female goats, inducing a lithium deficiency led to diminished fertility and increased postpartum mortalities.¹

Signs of Toxicity:

Not available.

Current Research:

Sodium Imbalances: According to Schauss, in the mid-1970's, researchers discovered that Li may confer a protective effect in treating sodium imbalance that contributes to atherosclerotic heart disease in humans. Other trials have shown that supplementing lithium chloride for sodium chloride reduced hypertension in persons with high blood pressure. Notes Schauss, "Recently researchers have found that Li's beneficial effect on salt imbalances may be due to the way in which Li is metabolized differently in the body than Na [sodium] and K [potassium]."¹

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Mental Disorders: Since the 1970's, researchers in Texas have noted that lithium found naturally in drinking water was inversely associated with the incidence of admissions and readmission of patients for psychoses, neuroses, and personality disorders in 27 Texas state mental hospitals.¹ Two years later the same study was repeated, with the results confirming the original's study's conclusion and that homicide rates were inversely related to lithium levels in water.

Mood Stabilizer:

Lithium is primarily known as a pharmaceutical drug therapy useful for the treatment of manic depression. But it is also a naturally occurring trace element found in certain bottled mineral waters, mineral-rich hot springs, and the Great Salt Lake. One will find trace amounts of it in MRI's products. Lithium has been shown to act as a mood stabilizer; it acts on the neurotransmitter *glutamate* keeping levels consistent and balanced between cells. Too little glutamate can cause depression while too much may cause agitation. A study published in *Trace Elements and Electrolytes* reveals another facet of lithium's effect on brain function—increased levels of nitric oxide, a molecule that occurs naturally in the body. Nitric oxide has been shown to be involved in numerous biological functions such as regulating the activity of the brain and other organs and controlling blood circulation.²

Immune Benefits: New studies have shown that lithium affects blood cell production and that its regulatory effects may boost the body's natural defense system against viral infections, specifically DNA viruses. In addition, in both *in-vitro* and human studies, lithium ions have been found to increase the synthesis of neuroprotective proteins in the human brain.³

References:

1. Schauss, A (1995). In: *Minerals and human health: the rationale for optimal and balanced trace element levels* (pp.35-38). Tacoma, WA: Life Sciences Press.
2. Toplan, S. Akyolcu MC, Ozcelik, Aydin S, Uzun H. (2005). Effects of experimental lithium application on nitric oxide in the brain. *Trace Elem Electrolytes*, 22(1):78.
3. Gallicchio VS (2005). Lithium effects in viruses, blood cell effects and signal transduction pathways. *Trace Elem Electrolytes*, 22(1):77.