



Thiamine – How Can We Not Forget About it?

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Imagine a component of our diet so critical that its absence could lead to death:

THIAMINE – essential for proper energy production by the body. Thiamine, commonly known as Vitamin B1, is an essential ingredient of our diet because our body cannot synthesize it on its own.¹ It is found in a variety of foods such as cereals, green vegetables, nuts, egg yolk and pork. Thiamine is also an ingredient of Reven's RJX™.

Thiamine deficiency can clinically affect the nervous system and manifest through symptoms such as irritability, impaired reflexes, peripheral neuropathy, and memory loss. Thiamine deficiency has also been associated with cardiovascular problems and immune dysregulation. The onset of symptoms can start in as little as four weeks following inadequate consumption of thiamine.^{2,3}

The mitochondria are the powerhouse of the cell. They are responsible for making our body's energy. Thiamine plays a key role here as a cofactor for three mitochondrial enzyme complexes: pyruvate, α -ketoglutarate, and branched-chain ketoacid dehydrogenases. When thiamine is low, these complexes are disrupted and oxidative metabolism can't happen. Instead, only glycolysis ensues to produce energy. This in turn leads to a buildup of lactic acid and an increase in oxidative stress. In extreme cases, it can cause lactic acidosis and death.³

When does the body require more than the usual amount of thiamine? Enhanced utilization of thiamine occurs in cases of hyperthyroidism, and for women during pregnancy or lactation. Hence, there is an elevated risk of deficiency as a result of such conditions.² A recent study shows that thiamine levels decrease in all women throughout the entire course of their pregnancy. In fact, it appears that as many as 50% of all expecting mothers can reach a clinically deficient level.⁴ Thiamine deficiency increases the risk of infant low birth weight. It is considered a potential contributory factor in sudden infant death syndrome if the deficiency persists throughout the breast feeding period.⁵



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Thiamine is essential for the balance of oxidants and antioxidants in the body through the production of nicotinamide adenine dinucleotide phosphate (NADPH) and glutathione, also referred to as the maintenance of cellular redox status.³ It has recently been suggested that thiamine plays a role in fatty acid oxidation by peroxisomes. Peroxisomes are important for lipid metabolism while they maintain the fatty sheath, myelin, that surrounds neurons⁶ – myelin is important for increasing the efficiency of the electrical signal that a neuron sends. Finally, it is suggested that thiamine can act as an antioxidant, although the mechanism is still not fully understood.

Earlier, we mentioned memory loss as a symptom of chronic thiamine deficiency. When looking at the different roles of thiamine, there appear to be many similarities between Alzheimer's disease and thiamine deficiencies. In Alzheimer's, there is a noted reduction of thiamine enzyme activity both in the brain itself and in the general circulation of the body. This decreased enzyme activity can lead to impairment of oxidative metabolism, an increase in oxidative stress, and a selective loss of neurons.¹ It should be noted that the exact mechanism of decreased activity is not yet fully understood. While thiamine supplementation has been tried in clinical trials with Alzheimer's patients, it has so far been met with less than satisfactory results.¹

Thiamine is essential for proper energy production, redox status and neuronal function. It can potentially help restore the homeostasis of these signaling mechanisms. Thiamine is an important component of Reven's RJX™. For more information, visit Reven's Web site – <https://www.reven.com>

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About Cardiovascular Disease

Cardiovascular disease (CVD) is a class of diseases that involve the heart or blood vessels. Cardiovascular disease includes coronary artery diseases such as angina and myocardial infarction. Other CVDs include stroke, heart failure, rheumatic heart disease, cardiomyopathy, heart arrhythmia, congenital heart disease and more. Cardiovascular diseases are the leading cause of death globally, of which coronary artery disease and stroke account for 80% of CVD deaths in males and 75% of CVD deaths in females. In the United States, 11% of people between 20 and 40 have CVD, while 37% between 40 and 60, 71% of people between 60 and 80, and 85% of people over 80 have CVD.

About Reven, LLC

Reven, LLC is a Golden, Colorado based biopharmaceutical company. Reven's vision is to make a difference in the world by making its products accessible to everyone suffering the effects of cardiovascular disease. Reven is committed to being the premier, research-intensive biopharmaceutical company that advances the health and well-being of people around the world. Its primary product, RJX, targets Critical Limb Ischemia patients facing amputation as well as a larger patient population suffering PAD and other vascular related medical conditions.

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