



Niacinamide – Got Healthy Cells?

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When you want fats and sugars to function properly in your body, it seems you can't go wrong with niacinamide. Niacinamide, or vitamin B3, helps keep your cells healthy, and is a component of Reven's RJX™.

Niacinamide is commonly found in a variety of foods such as fish, poultry, whole grains, green vegetables, and beans. A diet induced deficiency of niacinamide is rare. Clinically, a lack of vitamin B3 can present as a significant number of symptoms: headache, depression, memory loss, fatigue, a skin rash or rough skin, circulatory problems, vomiting, diarrhea, and in extreme cases pellagra. Pellagra, an Italian term, literally translates to "rough skin". As pellagra progresses, it can lead to dementia and eventually death. Excessive or chronic alcohol consumption can reportedly also lead to pellagra by decreasing the absorption ability of vitamin B3 in the small intestines.¹

In the body, vitamin B3 exists mainly in two forms: nicotinamide adenine dinucleotide (NAD⁺), and nicotinamide adenine dinucleotide phosphate (NADP⁺). NAD⁺ functions as an electron carrier during oxidative phosphorylation, an energy making process in the mitochondrion—the powerhouse of a cell. The other main form of vitamin B3, NADP⁺, functions as a proton donor (H⁺) in the formation of fatty acids, steroids, or other co-enzymes.

On the cellular level, a deficiency in vitamin B3 can cause mitochondrial dysfunction. This, in turn, leads to decreasing energy production, as well as impairments to glycolysis and increased inflammatory signaling.² Prolonged vitamin B3 deficiency can adversely affect the DNA repair mechanism.

Poly(adenosine diphosphate-ribose) polymerase (PARP) are a large family of enzymes, the most abundant of which is PARP1. It is an enzyme that utilizes the NAD⁺ form to repair damaged DNA. A niacin deficiency has been shown to increase mutations in DNA and increase the risk for cancer.³ PARPs can play a critical role in restoring DNA functionality.



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Along with diet induced deficiencies, disease states can also cause a rapid depletion of vitamin B3. This is due to a reprogramming of the metabolism to burn sugars for energy production rather than utilizing the oxidative metabolism in the mitochondria.⁴ One example of this occurs during sepsis.

In a canine model of endotoxin shock, the NAD⁺ pool and energy (adenosine triphosphate (ATP)) availability were significantly decreased during the early phase, which is accompanied by a decrease in oxygen consumption.⁵ This was further validated in a clinical trial of patients with severe sepsis or cardiac shock.⁶ Within 48 hours of admission to the intensive care unit, a patient's mitochondrial function was assessed.⁶ Patients had both lower niacinamide levels and mitochondrial activity.⁶

Though there does not appear to be a direct link between energy (ATP) levels and niacinamide treatment in septic shock,⁷ a reduction of inflammation and an increase in survival rate with vitamin B3 treatment has been observed. In a mouse model of sepsis induced through bacterial infections, niacinamide treatment significantly reduced inflammation and increased the survival rate.⁸ In parallel, treatment with nicotinamide following bacterial infection prevented the decrease in mitochondrial function and intracellular depletion of NAD⁺.⁵

Niacinamide— vitamin B3—plays a vital role in the restoration of proper oxidative metabolism in the body. It aids in the result of increased and more efficient energy production and reduced inflammation. Niacinamide plays an essential role in 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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