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Nicotinamide riboside, a trace nutrient in foods, is a vitamin B3 with effects on energy metabolism and neuroprotection.

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Abstract

PURPOSE OF REVIEW: This review focuses upon the biology and metabolism of a trace component in foods called nicotinamide riboside. Nicotinamide riboside is a precursor of nicotinamide adenine dinucleotide (NAD), and is a source of Vitamin B3. Evidence indicates that nicotinamide riboside has unique properties as a Vitamin B3. We review knowledge of the metabolism of this substance, as well as recent work suggesting novel health benefits that might be associated with nicotinamide riboside taken in larger quantities than is found naturally in foods.

RECENT FINDINGS: Recent work investigating the effects of nicotinamide riboside in yeast and mammals established that it is metabolized by at least two types of metabolic pathways. The first of these is degradative and produces nicotinamide. The second pathway involves kinases called nicotinamide riboside kinases (Nrk1 and Nrk2, in humans). The likely involvement of the kinase pathway is implicated in the unique effects of nicotinamide riboside in raising tissue NAD concentrations in rodents and for potent effects in eliciting insulin sensitivity, mitochondrial biogenesis, and enhancement of sirtuin functions. Additional studies with nicotinamide riboside in models of Alzheimer's disease indicate bioavailability to brain and protective effects, likely by stimulation of brain NAD synthesis.

SUMMARY: Initial studies have clarified the potential for a lesser-known Vitamin B3 called nicotinamide riboside that is available in selected foods, and possibly available to humans by supplements. It has properties that are insulin sensitizing, enhancing to exercise, resisting to negative effects of high-fat diet, and neuroprotecting.

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