

Vitamin B3

AT A GLANCE

Introduction

Vitamin B3, also called niacin, is one of the water-soluble B vitamins. The term niacin refers to nicotinic acid and nicotinamide (also called niacinamide). Both are used to form the coenzymes nicotinamide adenine dinucleotide (NAD) and nicotinamide adenine dinucleotide phosphate (NADP) which play essential roles in living cells (REF: <https://www.ncbi.nlm.nih.gov/pubmed/23948546>).

Since nicotinic acid can also be synthesized in humans from the amino acid tryptophan, it does not qualify as a vitamin provided that an adequate dietary supply of tryptophan is available.

Health Functions

A sufficient intake of vitamin B3 (niacin) is important as it helps the body to

- convert food into glucose, used to produce energy
- produce macromolecules, including fatty acids and cholesterol
- DNA repair and stress responses.

The European Food Safety Authority (EFSA), which provides scientific advice to assist policy makers, has confirmed that clear health benefits have been established for the dietary intake of niacin (vitamin B3) in contributing to:

- normal energy-yielding metabolism;
- the normal function of the nervous system;
- the maintenance of normal skin and mucous membranes.

Disease Risk Reduction

Cancer

Some preliminary study results have indicated that increased consumption of vitamin B3 (niacin), along with other micronutrients, might be associated with a decreased incidence of mouth and throat cancer.

Diabetes

Some evidence suggests that vitamin B3 (nicotinamide) might help to delay the time individuals with type 1 diabetes would need to take insulin.

Other Applications

Please note:

Any dietary or drug treatment with high-dosed micronutrients needs medical supervision.

High cholesterol

Vitamin B3 (nicotinic acid) supplements in high doses have been used successfully to lower elevated LDL (bad) cholesterol and fat (triglyceride) levels in the blood and to increase HDL (good). However, side effects (e.g., flushing of the skin) can be unpleasant and may be harmful in long-term use (liver damage).

Atherosclerosis

Because high-dose vitamin B3 (nicotinic acid) lowers LDL and triglycerides in the blood, it may help prevent hardening of the arteries (atherosclerosis). However, niacin also increases levels of homocysteine in the blood, which is associated with an increased risk of heart disease.

Intake Recommendations

The daily requirement of vitamin B3 (niacin) depends on the quantity of the amino acid tryptophan in the diet, which can be converted to niacin in the body: 60 mg tryptophan converted to 1 mg niacin is referred to as 1 niacin equivalent (NE). In most European countries and the U.S., the recommended intake for adults is about 16 mg NEs for men and 14 mg NEs for women.

Supply Situation

Most healthy people who eat a well-balanced diet get enough vitamin B3. However, dietary surveys indicate that 15 to 25% of older adults do not consume enough vitamin B3 (niacin) in their diets to meet the recommended intake values.

Deficiency

In developed countries, where vitamin B3 deficiency is rare, alcoholism is the prime cause of deficiency. Symptoms of mild deficiency include indigestion, fatigue, canker sores, vomiting, and depression.

Sources

Yeast, liver, poultry, lean meats, nuts and legumes contribute most of the niacin obtained from food. In cereal products (e.g., corn, wheat), niacin is bound to certain components of the cereal and is thus not bioavailable.

The amino acid tryptophan contributes as much as two thirds of the niacin activity required by adults in typical diets. Important food sources of tryptophan are meat, milk and eggs.

Safety

While vitamin B3 (niacin) from foods is not known to cause adverse effects, side effects have been reported with high-dose preparations of niacin for disease treatment.

Tolerable upper intake level

To avoid adverse effects, health authorities in Europe and the U.S. have set tolerable upper intake levels for niacin. While in the U.S. 35 mg nicotinic acid plus nicotinamide per day is the recommended upper dose for adults, 10 mg nicotinic acid per day and 900 mg nicotinamide per day have been established in the European Union.

Drug interactions

Please note:

Because of the potential for interactions, dietary supplements should not be taken with medication without first talking to an experienced healthcare provider.

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