

# Know Your Vitamin: Vitamin B3

## Standing tall in the 'B complex' crowd

**Did you know which B vitamins are required in higher quantity in our bodies?** Have a look below at the Dietary reference intakes or DRIs of essential B Vitamins as per Institute of Medicine (1998). All eight B vitamins that are essential have a collective DRI of 25 mg/d of which a staggering 16mg or 63% of the requirement comes from just one B vitamin – i.e. Vitamin B3. It's not a surprise then if you read the label of a standard multi B-vitamin supplement, it will have vitamin B3 in very high proportions.

Vitamin B3 has its own place not just within the B group of vitamins but also among all essential vitamins. For instance, if you compare RDA level of Vitamin B3 with all the other 13 essential fat and water soluble vitamins, you will see that vitamin B3 has the second highest RDA after Vitamin C (DRI of Vitamin C is 90 mg/d while that of Vitamin B3 is 16 mg/d).

**Why do we need Vitamin B3 in human body?** Consider a daily intake of 2500 Kcal of energy for an adult. In the human body, not all of this energy is used to expend as energy. After metabolism of energy takes place, only about 35% of this energy is stored in the body and remaining 65% is released as heat to maintain body temperature. Vitamin B3 (niacin or niacinamide) in the body plays a crucial role in this 35% energy release from foods by becoming a part of about 200 enzymes and co-factors NAD and NADPH.

	Vitamin	RDA (mg/day)*	% share
1	Vitamin B3/ Niacin or Niacinamide	16	63%
2	Vitamin B5/Pantothenic acid	5	20%
3	Vitamin B2/Riboflavin	1.3	5%
4	Vitamin B6/Pyridoxine	1.3	5%
5	Vitamin B1/Thiamine	1.2	5%
6	Vitamin B9/Folic acid	0.4	2%
7	Vitamin B7/Biotin	0.03	0.12%
8	Vitamin B12/Cobalamine	0.0024	0.01%
	<b>Total</b>	<b>25.2324</b>	<b>100%</b>

\*RDA amounts for healthy adult male have been taken for comparison

- NAD is used in the breakdown of sugar and the oxidation of fatty acids for energy production
- NADPH is used in folate metabolism and the synthesis of fatty acids, cholesterol, steroid hormones and important precursors of DNA.

Arguably, deficiency of vitamin B3 would result in even lesser than 35% of energy being available to the body because the enzymes are not present for conversion to storable energy! Vitamin B3 also provides cognition benefits, important for vascular blood flow and is necessary for healthy teeth, bones, hair and skin (prevents moisture loss from skin, irritation & acne, yellowing of skin, fine lines and wrinkles, hyperpigmentation). These beneficial claims are approved claims worldwide.

**From where do we get Vitamin B3?** Vitamin B3 can be formed in the body to some extent from the amino acid tryptophan (present in all dietary proteins); however, the ability to utilize tryptophan for vitamin B3 synthesis is inefficient (60 mg of tryptophan are required to synthesize 1 mg of vitamin B3). Moreover, the priority for body tryptophan utilization is protein synthesis before vitamin B3 synthesis. Thus, once protein synthesis needs are met, a greater proportion of tryptophan will be available for conversion to vitamin B3. Further, inadequate intake of iron, vitamin B2 or vitamin B6 decreases the body's ability to produce vitamin B3 from tryptophan. As a result, dependence on dietary sources of vitamin B3 is considered vital.

Rich sources of vitamin B3 are tuna fish, ground nuts and other lean meats. Whole grains, seeds, legumes, coffee and tea, green vegetables also contain vitamin B3. Vitamin B3 present in cereals like maize is largely in bound form so less than half of it is bio-available.

**Wonder ingredient in formulations?** Indeed, Vitamin B3 can be found in a variety of formulations from food to beauty & personal care.

**Food applications** include nutritional supplements and fortified foods with main applications including bakery, baby food and pet food. Foods such as breads, corn meal, corn flour, wheat flour, macaroni, rice, margarine are also often fortified with vitamin B3. As per a market research, over 10,000 new formulations have been launched in just last 3 years where Vitamin B3 finds mention as an included ingredient.

**Beauty & personal care** include: Skincare, Hair products, Soap & bath products, Colour cosmetics, Shaving & Depilatories, Deodorants and Fragrances in which there has been tremendous growth of formulations having vitamin B3. Can you believe then that there are unique 3,600 formulations launched in the global market in last 3 years out there that contains this vitamin.

Although, it is one of the oldest known vitamins, formulators are still extensively working on it and generating new avenues for mankind to get benefits of this wonder vitamin that stands tall in the B vitamin group.

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