

**WATER - SOLUBLE VITAMINS:
VITAMIN B₃ (NIACIN)**

Patient Resource

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Functions of Niacin

- energy production
- cellular processes such as DNA repair/activity
- nutrient metabolism
- plays a role in over 200 reactions in the body

Did you know...?

Niacin is found **naturally** in some foods and **fortified** in other foods! It's also **bound** in some forms, meaning that it is not naturally in an available form (see next page for more information).

How stable is Niacin?

Niacin experiences minimal losses when exposed to cooking or storage.



Sources of Riboflavin

Enriched Grains

& Pastas

- bread
- cereal
- whole grains
- rice
- spaghetti

Vegetables

- asparagus
- tomatoes & tomato products
- peas
- green vegetables

Nuts & seeds

- lentils
- peanuts
- peanut butter

Drinks & other

- Coffee (roasted varieties)
- tea
- tofu
- milk

Major Sources

- **Organ meats:** beef liver
- **Fish:** yellow fin tuna, swordfish, halibut, salmon
- **Meat:** top beef sirloin, chicken breast, veal loin

Other Animal Sources

- eggs
- sardines



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Niacin-bound Sources



*treatment with lime water may increase availability

Corn **Wheat** **Some cereal products**

VITAMIN B₃ (NIACIN)

names + forms

Animal Foods



- nicotinamide
- nicotinamide nucleotides (NAD and NADP)

Plant Foods



- nicotinic acid

Bound forms

Some foods contain the bound form of B₃:

- corn
- wheat
- some other cereal products

Supplements & Fortification



- nicotinamide

NOTE:

It can be helpful to bring in your supplements to a doctor's visit or your next appointment with your healthcare providers. Providing the actual containers of products you take can help your healthcare team to avoid under- or over-dosing you or your family members on supplements. It is also a helpful practice since there are many B vitamins and their variants can go by different names.



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Dietary Reference Intakes

The amount of niacin you need depends on your sex and age. Recommendations for niacin are also expressed in niacin equivalents (NE). The requirements listed in the chart are expressed in NE, with the exception of recommendations for infants younger than six months, which are expressed in terms of pre-formed niacin. Infant requirements for all nutrients are expressed in terms of Adequate Intake, or AI.

Helpful Terms to Know

- **Recommended Dietary Allowance (RDA):** covers the needs of 97-98% of individuals in a group; the average amount of a nutrient a healthy person should consume daily. Vary by gender, age, and whether a woman is pregnant or breastfeeding. Developed by the Food and Nutrition Board at the Institutes of Medicine (IOM) of the National Academies.
- **mg** = milligram
- **Adequate Intake (AI):** recommended daily intake of a nutrient; established by Institute of Medicine (IOM) to meet or to exceed the needed amount to maintain adequate nutrition for most people in a particular stage of life or gender group; established when not enough evidence is available to determine the RDA

Recommended Daily Amounts (RDA) of Niacin (in mg/day NE)	
Infants	
0-6 months	2
7-12 months	4
Children	
1-3 years	6
4-8 years	8
9-13 years	12
Males	
14- >70 years	16
Females	
14->70 years	14
Pregnancy	
Under 18- 50 years	18
Lactation	
Under 18-50 years	17

VITAMIN B₃ (NIACIN)
DEFICIENCY

PELLE + AGRA

["skin" + "rough"]

THE 4 D'S (SIGNS & SYMPTOMS)

01 | dermatitis

Skin becomes inflamed, similar to a sunburn. Places effected by the sun experience irritation. *Casal's collar* may be present.

03 | diarrhea

Gastrointestinal upsets, attributed to Niacin's anti-inflammatory roles in the colon and digestive tract. *Glossitis* (inflammation of the tongue), *cheilosis* and *angular stomatitis* (inflamed/cracked lips and mouth), nausea and vomiting.

02 | dementia/delirium

Headache, apathy, fatigue, loss of memory, peripheral neuropathy, paralysis of the extremities, confusion, disorientation.

04 | death (if untreated)

Headache, apathy, fatigue, loss of memory, peripheral neuropathy, paralysis of the extremities, confusion, disorientation.



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Totoxicity

Niacin supplementation, even in accepted amounts, can have unwanted side effects. This means that you should definitely be aware of vitamin B₃ and its upper limit. The upper limit for adults has been set at 35 mg/day. Again, I want to emphasize that there can be side effects even before reaching this amount from niacin supplementation, so keep that in mind if you are considering a supplement.

SUPPLEMENTATION & TREATMENT

Uses

Niacin is used to treat **hyperlipidemias** (high blood lipids), lower serum **cholesterol** and low-density lipoproteins (LDL) and to increase high-density lipoproteins (HDL, more commonly known as the “**good**” **cholesterol**). In some cases, a topical form of niacin is used for **acne vulgaris** or **non-melanoma skin cancers**. To treat deficiency, oral nicotinamide is typically administered at 300 mg/day (usually in three separate doses of 100 mg spread throughout the day to avoid upset or negative side effects) for the duration of about one month.

VITAMIN B₃ (NIACIN)

supplementation side effects

Face & Neck



- redness
- flushing (even in as low as 30-50 mg/day)
- *Pruritus* (burning/itching)

Body



- tingling
- headaches

GI & Other



- heartburn
- nausea & vomiting
- liver injury
- hyperuricemia (excess of uric acid in the blood)
- gout
- glucose intolerance

Dietary Supplements

Those being treated for conditions necessitating large doses of this vitamin should do so 1) under medical supervision, and 2) only after considering the potential toxic side effects weighed against the potential benefits for that individual.

Recommendations

Extended release forms of niacin supplements may help to reduce side effects. Your healthcare team can also design a vitamin regimen that appropriately spaces out your dosage to reduce side effects. Ask your doctor or dietitian for more information about adjusting your dosage and delivery method.