Niacin and Niacinamide (Vitamin B3)

What is it?

Niacin and niacinamide are forms of Vitamin B3. Vitamin B3 is found in many foods including yeast, meat, fish, milk, eggs, green vegetables, beans, and cereal grains. Niacin and niacinamide are also found in many vitamin B complex supplements with other B vitamins.

Niacin is used for high cholesterol. It is also used along with other treatments for circulation problems, migraine headache, dizziness, and to reduce the diarrhea associated with cholera. Niacin is also used for preventing positive urine drug screens in people who take illegal drugs.

Niacinamide is used for treating diabetes and two skin conditions called bullous pemphigoid and granuloma annulare.

Niacin or niacinamide is used for preventing vitamin B3 deficiency and related conditions such as pellagra. Each of these forms of vitamin B3 is used for schizophrenia, hallucinations due to drugs, Alzheimer’s disease and age-related loss of thinking skills, chronic brain syndrome, depression, motion sickness, alcohol dependence, and fluid collection (edema).

Some people use niacin or niacinamide for acne, leprosy, attention deficit-hyperactivity disorder (ADHD), memory loss, arthritis, preventing premenstrual headache, improving digestion, protecting against toxins and pollutants, reducing the effects of aging, lowering blood pressure, improving circulation, promoting relaxation, improving orgasm, and preventing cataracts.

Niacinamide is applied to the skin for treating a skin condition called inflammatory acne vulgaris.

How effective is it?

*Natural Medicines Comprehensive Database* rates effectiveness based on scientific evidence according to the following scale: Effective, Likely Effective, Possibly Effective, Possibly Ineffective, Likely Ineffective, Ineffective, and Insufficient Evidence to Rate.

The effectiveness ratings for **NIACIN AND NIACINAMIDE (VITAMIN B3)** are as follows:

**Likely effective for...**

- **High cholesterol.** Only niacin seems to lower cholesterol, not niacinamide. Some niacin products are FDA-approved prescription products for treating high cholesterol. These prescription niacin products typically come in high strengths of 500 mg or higher. Dietary supplement forms of niacin usually come in strengths of 250 mg or less. Since very high doses of niacin are required for high cholesterol, dietary supplement niacin usually isn’t appropriate.

- **Treatment and prevention of niacin deficiency, and certain conditions related to niacin deficiency such as pellagra.** Both niacin and niacinamide are approved by the U.S. Food and Drug Administration (FDA) for these uses. Niacinamide is sometimes preferred because it doesn’t cause “flushing,” (redness, itching and tingling), a side effect of niacin treatment.

**Possibly effective for...**
• **Osteoarthritis.** Taking niacinamide seems to improve joint flexibility and reduce pain and swelling. Some people who take niacinamide might be able to cut down on standard painkilling medications.

• **Alzheimer’s disease.** People who consume higher amounts of niacin from food and multivitamin sources seem to have a lower risk of getting Alzheimer’s disease than people who consume less niacin. But there is no evidence that taking a stand-alone niacin supplement helps to prevent Alzheimer’s disease.

• **Hardening of the arteries (atherosclerosis).**

• **Reducing the risk of a second heart attack in men with heart or circulatory disorders.**

• **Diarrhea from an infection called cholera.**

• **Diabetes, types 1 and 2.**

• **Prevention and treatment of cataracts, an eye condition.**

**Insufficient evidence to rate effectiveness for...**

• **Attention deficit-hyperactivity disorder (ADHD).** There is conflicting evidence regarding the usefulness of niacinamide in combination with other vitamins for the treatment of ADHD.

• **Migraine headache.**

• **Dizziness.**

• **Depression.**

• **Motion sickness.**

• **Alcohol dependence.**

• **Improving orgasm.**

• **Acne.**

• **Other conditions.**

More evidence is needed to rate niacin and niacinamide for these uses.

**How does it work?**

Niacinamide can be made from niacin in the body. Niacin is converted to niacinamide when it is taken in amounts greater than what is needed by the body. Niacin and niacinamide are easily dissolved in water and are well-absorbed when taken by mouth.

Niacin and niacinamide are required for the proper function of fats and sugars in the body and to maintain healthy cells. At high doses, niacin and niacinamide can have different effects. Niacin might help people with heart disease because of its beneficial effects on clotting. It may also improve levels of a certain type of fat called triglycerides in the blood. Niacinamide has no beneficial effects on fats and should not be used for treating high cholesterol or high fat levels in the blood.

Niacin deficiency can cause a condition called pellagra, which causes skin irritation, diarrhea, and dementia. Pellagra was common in the early twentieth century, but is less common now, since foods are now fortified with niacin. Pellagra has been virtually eliminated in western culture.

People with poor diet, alcoholism, and some types of slow-growing tumors called carcinoid tumors might be at risk for niacin deficiency.

**Are there safety concerns?**
Niacin and niacinamide are **LIKELY SAFE** for most people when taken by mouth. A common minor side effect of niacin is a flushing reaction. This might cause burning, tingling, itching, and redness of the face, arms, and chest, as well as headaches. Starting with small doses of niacin and taking 325 mg of aspirin before each dose of niacin will help reduce the flushing reaction. Usually, this reaction goes away as the body gets used to the medication. Alcohol can make the flushing reaction worse. Avoid large amounts of alcohol while taking niacin.

Other minor side effects of niacin and niacinamide are stomach upset, intestinal gas, dizziness, pain in the mouth, and other problems.

When doses of over 3 grams per day of niacin are taken, more serious side effects can happen. These include liver problems, gout, ulcers of the digestive tract, loss of vision, high blood sugar, irregular heartbeat, and other serious problems. Similar side effects can happen with large doses of niacinamide.

Some concern has been raised about stroke risk in people taking niacin. In one large study, people who took high doses of niacin had a two-fold greater risk of stroke compared to those not taking niacin. But it is unclear if this outcome was due to niacin or some other unknown factor. Previous research has not identified any stroke risk related to taking niacin. Most experts believe that it is too soon to jump to any conclusions about niacin and strokes.

Niacinamide is **POSSIBLY SAFE** when used appropriately in children.

**Special precautions & warnings:**

**Pregnancy and breast-feeding:** Niacin and niacinamide are **LIKELY SAFE** for pregnant and breast-feeding women when taken in the recommended amounts. The recommended amount of niacin for pregnant or breast-feeding women is 30 mg per day for women under 18 years of age, and 35 mg for women over 18.

**Allergies:** Niacin and niacinamide can make allergies more severe because they cause histamine, the chemical responsible for allergic symptoms, to be released.

**Heart disease/unstable angina:** Large amounts of niacin and niacinamide can increase the risk of irregular heartbeat. Use with caution.

**Diabetes:** Niacin and niacinamide might increase blood sugar. People with diabetes who take niacin or niacinamide should check their blood sugar carefully.

**Gallbladder disease:** Niacin and niacinamide might make gallbladder disease worse.

**Gout:** Large amounts of niacin or niacinamide might bring on gout.

**Low blood pressure:** Don’t take niacin or niacinamide if you have low blood pressure. Your blood pressure might drop too much.

**Liver disease:** Niacin or niacinamide might increase liver damage. Don’t use them if you have liver disease.

**Kidney disease:** Niacin might accumulate in people with kidney disease and cause harm. Don’t use them if you have kidney disease.

**Stomach or intestinal ulcers:** Niacin or niacinamide might make ulcers worse. Don’t use them if you have ulcers.
**Surgery:** Niacin and niacinamide might interfere with blood sugar control during and after surgery. Stop taking niacin or niacinamide at least 2 weeks before a scheduled surgery.

**Are there interactions with medications?**

**Moderate**

**Be cautious with this combination.**

**Alcohol (Ethanol)**
Niacin can cause flushing and itchiness. Consuming alcohol along with niacin might make the flushing and itching worse. There is also some concern that consuming alcohol with niacin might increase the chance of having liver damage.

**Allopurinol (Zyloprim)**
Allopurinol (Zyloprim) is used to treat gout. Taking large doses of niacin might worsen gout and decrease the effectiveness of allopurinol (Zyloprim).

**Carbamazepine (Tegretol)**
Carbamazepine (Tegretol) is broken down by the body. There is some concern that niacinamide might decrease how fast the body breaks down carbamazepine (Tegretol). But there is not enough information to know if this is important.

**Clonidine (Catapres)**
Clonidine and niacin both lower blood pressure. Taking niacin with clonidine might cause your blood pressure to become too low.

**Medications for diabetes (Antidiabetes drugs)**
Long-term use of niacin and niacinamide might increase blood sugar. By increasing blood sugar, niacin and niacinamide might decrease the effectiveness of diabetes medications. Monitor your blood sugar closely. The dose of your diabetes medication might need to be changed.

Some medications used for diabetes include glimepiride (Amaryl), glyburide (DiaBeta, Glynase PresTab, Micronase), insulin, pioglitazone (Actos), rosiglitazone (Avandia), metformin (Glucophage), nateglinide (Starlix), repaglinide (Prandin), chlorpropamide (Diabinese), glipizide (Glucotrol), tolbutamide (Orinase), and others.

**Medications used for lowering cholesterol (Bile acid sequestrants)**
Some medications for lowering cholesterol called bile acid sequestrants can decrease how much niacin or niacinamide the body absorbs. This might reduce the effectiveness of niacin or niacinamide. Take niacin or niacinamide and the medications at least 4-6 hours apart.

Some of these medications used for lowering cholesterol include cholestyramine (Questran) and colestipol (Colestid).

**Medications used for lowering cholesterol (Statins)**
Niacin can adversely affect the muscles. Some medications used for lowering cholesterol called statins can also affect the muscles. Taking niacin along with these medications might increase the risk of muscle problems.

Some of these medications used for high cholesterol include rosuvastatin (Crestor), atorvastatin (Lipitor), lovastatin (Mevacor), pravastatin (Pravachol), fluvastatin (Lescol), and simvastatin (Zocor).
**Primidone (Mysoline)**
Primidone (Mysoline) is broken down by the body. There is some concern that niacinamide might decrease how fast the body breaks down primidone (Mysoline). But there is not enough information to know if this is important.

**Probenecid**
Probenecid is used to treat gout. Taking large doses of niacin might worsen gout and decrease the effectiveness of probenecid.

**Sulfinpyrazone (Anturane)**
Sulfinpyrazone (Anturane) is used to treat gout. Taking large doses of niacin might worsen gout and decrease the effectiveness of sulfinpyrazone (Anturane).

**Minor**
Be watchful with this combination.

**Aspirin**
Aspirin is often used with niacin to reduce the flushing caused by niacin. Taking high doses of aspirin might decrease how fast the body gets rid of niacin. This could cause there to be too much niacin in the body and possibly lead to side effects. But the low doses of aspirin most commonly used for niacin-related flushing don't seem to be a problem.

**Nicotine patch (Transdermal nicotine)**
Niacin can sometimes cause flushing and dizziness. The nicotine patch can also cause flushing and dizziness. Taking niacin or niacinamide and using a nicotine patch can increase the possibility of becoming flushed and dizzy.

**Are there interactions with herbs and supplements?**

**Antioxidants**
A combination of niacin and the prescription drug simvastatin (Zocor) raises HDL (high density lipoprotein) cholesterol ("good cholesterol") in people with coronary heart disease and low HDL levels. But taking niacin along with combinations of antioxidants (selenium, vitamin C, vitamin E, and beta-carotene) seems to blunt this rise in HDL. It is not known whether this effect happens in people who don't have coronary heart disease.

**Chromium**
Taking niacin and chromium together might lower blood sugar. If you have diabetes and take chromium and niacin supplements together, monitor your blood sugar to make sure it doesn't get too low.

**Herbs and supplements that might harm the liver**
Niacin, especially in higher doses can cause liver damage. Taking niacin along with other herbs or supplements that might harm the liver could increase this risk. Some of these products include androstenedione, borage leaf, chaparral, comfrey, dehydroepiandrosterone (DHEA), germander, kava, pennyroyal oil, red yeast, and others.

**Kombucha tea**
There is some concern that kombucha tea might decrease niacin absorption. But this needs to be studied more.
Zinc
The body can make niacin. People who are malnourished and have niacin deficiency, such as chronic alcoholics, make extra niacin if they take zinc. There might be an increased risk of niacin-related side effects such as flushing and itching if niacin and zinc are taken together.

Are there interactions with foods?

Hot drinks
Niacin can cause flushing and itching. These effects might be increased if niacin is taken with a hot drink.

What Dose is used?
The following doses have been studied in scientific research:

BY MOUTH:

- For high cholesterol: The effects of niacin are dose-dependent. The biggest increases in HDL and decreases in triglycerides occur at 1200-1500 mg/day. Niacin’s greatest effects on LDL occur at 2000-3000 mg/day.
- To prevent heart disease in people with high cholesterol: Niacin 4 grams daily.
- For preventing and treating vitamin B3 deficiency: Doses of nicotinic acid and niacinamide are considered equivalent. For mild vitamin B3 deficiency, niacin or niacinamide 50-100 mg per day is used. For pellagra in adults, niacin or niacinamide 300-500 mg daily is given in divided doses. For pellagra in children, niacin or niacinamide 100-300 mg daily is given in divided doses. For Hartnup disease, niacin or niacinamide 50-200 mg daily.
- For reducing fluid loss caused by cholera toxin: Niacin 2 grams daily.
- To prevent type 1 diabetes in high-risk children: Sustained-release niacinamide 1.2 grams/m² (body surface area) per day.
- To slow disease progression of newly diagnosed type 1 diabetes: Niacinamide 25 mg/kg daily.
- For treating osteoarthritis: Niacinamide 3 grams per day in divided doses.
- For reduced risk of cataracts: A daily dietary intake of approximately 44 mg of niacin.
- For preventing Alzheimer’s disease: 17-45 mg of niacin from food and multivitamins. Food sources high in niacin include meat, fish, beans, nuts, coffee, and fortified grains and cereals. Note that there is no reliable evidence that taking a stand-alone niacin supplement will help to prevent Alzheimer’s disease.

The daily recommended dietary allowances (RDAs) of niacin are: Infants 0-6 months, 2 mg; Infants 7-12 months, 4 mg; Children 1-3 years, 6 mg; Children 4-8 years, 8 mg; Children 9-13 years, 12 mg; Men 14 years and older, 16 mg; Women 14 years and older, 14 mg; Pregnant women, 18 mg; and Lactating women, 17 mg. The maximum daily dose of niacin is: Children 1-3 years, 10 mg; Children 4-8 years, 15 mg; Children 9-13 years, 20 mg; Adults, including Pregnant and Lactating women, 14-18 years, 30 mg; and Adults, including pregnant and breast-feeding women, older than 18 years, 35 mg.

Other Names
3-Pyridine Carboxamide, 3-Pyridinecarboxylic Acid, Acide Nicotinique, Acide Pyridine-Carboxyle-3, Amide de l’Acide Nicotinique, Anti-Blacktongue Factor, Antipellagra Factor, B Complex Vitamin, Complexe de Vitamines B, Facteur Anti-Pellagra, Niacin-Niacinamide, Niacin/Niacinamide, Niacina y Niacinamida,
Methodology

To learn more about how this article was written, please see the Natural Medicines Comprehensive Database methodology (http://www.nlm.nih.gov/medlineplus/druginfo/natural/methodology.html).

References

To see all references for the Niacin and niacinamide (Vitamin B3) page, please go to http://www.nlm.nih.gov/medlineplus/druginfo/natural/924.html.