

Metabolism and word niacin

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When you hear the word Niacin, what does it mean to you? What about Vitamin B3? You may have seen them on the back of cereal boxes, energy drinks or even in your daily multivitamin. Well they are in fact one in the same. However vitamin B3 comes in two different forms, nicotinic acid or Niacin and nicotinamide, while nicotinamide is a vitamin it does not have the same practical uses as Niacin. Today I am going to tell you a little about the history, biological uses, sources and the consequences of an overdose or deficiency in Niacin.

As a Biology major I think it is vital to stress the importance of getting the suggested daily dose of Niacin. But first let's discuss the history of Niacin. According to vitamin-basics.com, the structure of Niacin was first described by the Austrian chemist, Hugo Weidel in 1873 at the Vienna University of Technology, while studying the reaction of nicotine with nitric acid. Although the product of this reaction, Niacin, was already known Weidel was the first person to isolate large enough quantities to determine the properties of the material. In 1937 a Norwegian emigrant living in Wisconsin by the name of Conrad Elvehjem, extracted and identified a molecule found in the liver as a new vitamin now called niacin. He referred to this vitamin as the "pellagra-preventing factor". His isolation of this vitamin directly led to the cure of pellagra, a disease I will discuss a little later. Now because of nicotinic acid's new found importance it was thought appropriate to come up with a new name. The name, as shown here, comes from combining specific letters in nicotinic acid and vitamin.

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Now that we've covered some history, I'd like to take a look at some of the uses of Niacin. Niacin along with other B vitamins help our bodies metabolize fats and protein, as well as maintain healthy skin, eyes, hair and liver. They also help the nervous system function properly. Niacin is the precursor to NAD⁺/NADH and NADP⁺/NADPH which are essential electron carriers involved in several metabolic pathways including glycolysis and the Citric acid cycle. As you may remember from your high school biology courses, glycolysis, the citric acid cycle and the electron transport chain are responsible for creating ATP which is our body's main energy source. Niacin also plays an important role in DNA repair as well as steroidal hormone production from the adrenal glands. As a prescription, Niacin is prescribed in quantities ranging from 500mg to 5000mg. Niacin is most commonly used to treat high cholesterol and it does so by lowering your LDL or "bad" cholesterol and increasing your HDL or "good" cholesterol.

Because Niacin reduces your LDL and increases your HDL it also helps prevent atherosclerosis or hardening of the arteries when coupled with other medication. According to the University of Maryland Medical Center, Niacin is also being tested for the possible treatment and/or prevention of diabetes types one and two as well as for osteoarthritis and Alzheimer's disease. High doses of Niacin can have its drawbacks so it is crucial to speak to your doctor if at all interested in exploring these avenues of treatment.

Now that we have an idea as to what Niacin can do, you may be asking: what are some common sources of Niacin? Well, Niacin can be found in a wide variety of foods including: liver, chicken, fish, milk, eggs, nuts, whole grain products and mushrooms among others. But food is not the only source of <https://assignbuster.com/metabolism-and-word-niacin/>

Niacin. Many multivitamins have Niacin including centrum, which contains 100 percent of the suggest daily value or 20mg. But, probably the most common source of Niacin amongst today's youth is energy drinks, including red bull and 5 hour energy.

In fact 5 hour energy has between 30 to 40mg of Niacin, which is way more than the average person requires. The suggest daily value of Niacin as per the united states department of agriculture is as follows: children 6 to 8 mg per day, for adult males 16mg per day, adult females 14 mg per day, pregnant women 18 mg per day and breastfeeding women 17 mg per day. Now that we know how much Niacin we should be getting daily, let's look at what happens when we get too much or not enough. Niacin flush is a distinct redness of the skin caused by the overconsumption of Niacin.

This skin flush is often accompanied by itching, dry skin and skin rashes including eczema. Niacin flush typically lasts 15 to 30 minutes as Niacin is water soluble and is thus easily removed from the body through urine. However, not everyone who overdoes on Niacin will experience these symptoms at all. Niacin flush can be minimized or avoided completely by taking 300mg of aspirin, approximately one tablet, half an hour before taking Niacin, taking one tablet of ibuprofen per day or by taking the Niacin with a meal. On the other hand a chronic lack of Niacin can result in Pellagra.

The most common reasons for this Niacin deficiency are dietary or the result of another disorder, such as Hartnup's disease which is a hereditary disease that affects the intestines and kidneys, making it difficult for the body to break down and absorb tryptophan, the amino acid required for Niacin

synthesis. Tryptophan is an essential amino acid meaning it must be ingested; it cannot be produced within the body. Pellagra is a disease that was first described in Spain in 1937. Characteristically the victims of Pellagra suffer from what is known as “ the four Ds” which are: diarrhea, dermatitis or skin lesions, dementia and death.

As previously mentioned the isolation of nicotinic acid in 1937 led to the eradication of Pellagra in the following years in the form of oral niacin supplements. There are still some future applications of Niacin in the medical field that have not been fully explored. In the past several minutes you have listened to me talk about the history, some sources of Niacin, how we as people use Niacin on a daily basis as well as the consequences of a Niacin overdose or deficiency. I really hope you learned something new from all of this and maybe the next time you see your doctor you can discuss how Niacin can best help you.