9 Surprising Ways Your Body Uses NAD+

NEW

SUMMER 2023 EDITION

Dear Tru Believer,

Welcome to the Tru Niagen® family and the fascinating world of NAD+ science!

As a seeker of new ways to improve your health, you're probably inundated with information about various supplements and new dietary fads. But Tru Niagen isn't your average supplement. The subject of more than 300 published studies, our key ingredient is the embodiment of over 50 years of science harnessed into one capsule that can transform the way you age. How? By increasing levels of a compound that's vital to all living organisms.

NAD+ (nicotinamide adenine dinucleotide) is a compound your body makes naturally. It's used for the healthy functioning of your 37.2 trillion cells in your body, helping to power the processes of repair and regeneration, and it's essential in generating over 90% of the energy your body uses every single day. Without NAD+, life as we know it would not be possible.

This little booklet details nine of the amazing ways that your body uses NAD+. Enjoy!

Your partners in age defiance,
The Tru Niagen Team

1

NAD+ and Aging

NAD+ is an important molecule in all cells and is involved in biological processes such as cellular metabolism and energy production, DNA repair, and gene expression. Research suggests that NAD+ declines by up to 65% between your early thirties and age 70[1,2]. A 2018 study highlights the relationship between NAD+ depletion and age-related health conditions and investigates how boosting NAD+ may support healthier aging[3].

2

NAD+ and Heart Health

NAD+ ensures that your mitochondria produce enough energy to drive cellular function. A decline in mitochondrial count and function in cardiac cells can affect heart health. In conjunction with a healthy diet and regular exercise, boosting your NAD+ levels helps your mitochondria produce the energy required to keep your heart healthy so you don’t skip a beat.

3

NAD+, Your Nervous System, and Brain

Research supports the hypothesis that boosting cellular NAD+ is important for normal brain function[4]. A recent study showed an increase in brain NAD+ with supplementation of an NAD+ precursor in healthy humans[5]. Consequently, NAD+ precursors can help support healthy neurons in the brain.

4

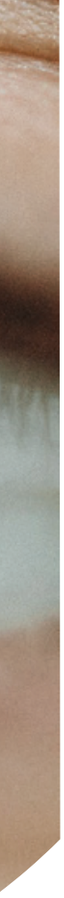
NAD+ and Muscles

NAD+ is crucial for your muscle health in two ways. Exercise and movement in general require a lot of energy, and your muscle cells use NAD+ to help fuel contraction and relaxation. Your cells also need to repair themselves from any damage done by those vigorous sessions at the gym, and cellular repair requires NAD+, too.

5

NAD+ and Eye Health

Your tissues and organs need a constant supply of cellular energy to function, and NAD+ plays a crucial role in this supply. One such energy-demanding tissue is the retina. A review article highlighted that declining levels of retinal NAD+ have been linked to health conditions of the retina in preclinical models[6]. UV light exposure can also damage ocular tissues. NAD+ is important in maintaining healthy tissues.



6

NAD+ and Environmental Stressors

Daily environmental factors such as smoking and pollution can trigger oxidative stress, leading to a decline in NAD+ and mitochondrial health. Oxidative stress is an imbalance that's a byproduct of oxygen metabolism and can cause cellular damage. We're subject to it every day. NAD+ is an important part of the body's defense against oxidative stress[7,8].

7

NAD+ and Alcohol

Processing alcohol in your body is an energy-expensive project, especially in your all-important liver cells. Your body works hard to metabolize and detox when you drink. On a cellular level, this requires your mitochondria (the power generators inside each of your cells) to kick into overdrive. When you drink alcohol, the liver must work to break it down into a substance called acetate. Without NAD+, this process couldn't occur.[9]

8

NAD+ and Sunlight

Did you know that excess sun exposure can damage your DNA? The good news is that NAD+ can actually help mend broken DNA strands. It's required by the repair enzymes that help you and your cells bounce back. Maintaining NAD+ levels helps support a family of enzymes called sirtuins that help maintain cellular health and repair cellular damage.

9

NAD+, Fat, and Carbs

NAD+ creation and consumption by your cells is linked to the regulation of fat metabolism and storage. NAD+ also plays an important role in the process of glycolysis, the cycle through which our bodies convert sugars (carbs) into useable energy.

Want to further your NAD+ knowledge even more?

Visit truniagen.com/blog

Sources Cited:

1. Massudi, H., Grant, R., Braidy, N., Guest, J., Farnsworth, B., and Guillemin, G. J. (2012). "Age-Associated Changes in Oxidative Stress and NAD+ Metabolism in Human Tissue." Plos One 7, e42357. doi: 10.1371/journal.pone.0042357.

2. Janssens, G. E., Grevendonk, L., Perez, R. Z., Schomakers, B. V., Bosch, J. de V. den, Geurts, J. M. W., et al. (2022). "Healthy Aging and Muscle Function Are Positively Associated with NAD+ Abundance in Humans." Nat Aging 2, 254–263. doi: 10.1038/s43587-022-00174-3.

3. Aman, Y., Qiu, Y., Tao, J., and Fang, E. F. (2018). "Therapeutic Potential of Boosting NAD+ in Aging and Age-Related Diseases." *Transl Medicine Aging* 2, 30–37. doi: 10.1016/j.tma.2018.08.003.

4. Lautrup, S., Sinclair, D. A., Mattson, M. P., and Fang, E. F. (2019). "NAD+ in Brain Aging and Neurodegenerative Disorders." *Cell Metab* 30, 630–655. doi: 10.1016/j.cmet.2019.09.001..

5. Vreones et al. (2022) "Oral Nicotinamide Riboside Raises NAD+ and Lowers Biomarkers of Neurodegenerative Pathology in Plasma Extracellular Vesicles Enriched for Neuronal Origin." *Aging Cell* Vol. 22, Issue 1. doi: 10.1111/acel.13754.

6. Jadeja, R. N., Thounaojam, M. C., Bartoli, M., and Martin, P. M. (2020). "Implications of NAD+ Metabolism in the Aging Retina and Retinal Degeneration." *Oxid Med Cell Longev* 2020, 2692794. doi: 10.1155/2020/2692794.

7. Circu, M. L., and Aw, T. Y. (2010). "Reactive Oxygen Species, Cellular Redox Systems, and Apoptosis." *Free Radical Bio Med* 48, 749–762. doi: 10.1016/j.freeradbiomed.2009.12.022.

8. Poljsak, B., and Milisav, I. (2016). "NAD+ as the Link Between Oxidative Stress, Inflammation, Caloric Restriction, Exercise, DNA Repair, Longevity, and Health Span." *Rejuv Res* 19, 406–413. doi: 10.1089/rej.2015.1767.

9. Zakhari S. "Overview: How Is Alcohol Metabolized by the Body?" *Alcohol Res Health* 2006;29(4):245-54. PMID: 17718403; PMCID: PMC6527027.

Follow us @truniagen
Share your #trubeliever story.

888.642.4361
customercare@truniagen.com

V4.02