Brain Health

Nicotinamide adenine dinucleotide (NAD+) 250mg | N-acetyl cysteine (NAC) 500mg capsules rice flour

Background

For many people today, their routine is defined by a busy on-the-go lifestyle lacking proper diet, exercise, and sleep. Many people focus on supplements that enrich the body, however, there is a new awareness of brain health that centers on treating the brain as an organ that demands proper care and nutrition to optimize cognition and affective health. It is important to properly supplement one's daily routine with nutrients that positively affect brain health. Wang, Pan, & Li (2020) cite that human brain functioning *"*is the highest product of biological evolution" (para. 1). [1] Furthermore, the authors state that maintaining brain health is foremost in promoting health and longevity. [1] The U.S. Centers for Disease Control and Prevention define brain and cognitive health as, "A healthy brain is one that can perform all the mental processes that are collectively known as cognition, including the ability to learn new things, intuition, judgment, language, and remembering" (p. 1). [1, 2]

The American Heart Association/American Stroke Association (AHA/ASA) presidential advisory defines optimal brain health as, "Average performance levels among all people at that age who are free of known brain or other organ system diseases in terms of decline from function levels, or as adequacy to perform all activities that the individual wishes to undertake . . .. emphasizes the importance of a favorable or ideal cardiovascular risk profile" (e284 - e303). [1, 3] The current Brain Health supplement capsule formulary is designed to promote a healthy mind by targeting the brain as an organ containing Nicotinamide adenine dinucleotide (NAD+) and N-acetyl cysteine (NAC) capsules rice flour.

Research

This proprietary brain health supplement formulary features Nicotinamide adenine dinucleotide (NAD+) and N-acetyl cysteine (NAC). According to Freeberg et al. (2023) the natural aging process and many disease states are associated with attenuating levels of NAD+. [4] Several studies have provided evidence that increasing NAD+ levels improve insulin sensitivity, restore mitochondrial dysfunction, and promote increased lifespan. [5, 6] According to Mokhtari et al. (2016) N-acetyl cysteine (NAC) is a known potent antioxidant with free oxygen radical scavenger properties. [7] The supplement appears effective in moderating oxidative damage, a feature associated with neurodegenerative disorders like Alzheimer's disease (AD) and Parkinson's disease (PD). [7]

There is available evidence from animal studies that puts forth that interventions designed to promote NAD levels positively impact the overall cardiometabolic health and immune function. [8] Radenkovic, Reason & Verdin (2020) suggest that decreasing NAD levels could be prevented with supplementation with NAD precursors, such as nicotinamide, half the formulary of this current supplement. [9] Additionally, there are insights that suggest that strength training may help to

increase falling NAD levels, an activity that could be combined with this supplement to amplify potential benefits. [10]

According to Tenório et al. (2021) N-acetyl cysteine (NAC) serves essential functions associated with antioxidant and anti-inflammatory properties, attracted to repairing cellular redox imbalances. [11] Based on this mechanism of action, NAC appears viable as treatment for diseases connected to oxidative stress as causation and progression, e.g., many neurodegenerative diseases (Alzheimer's disease (AD), amyotrophic lateral sclerosis (ALS), and Parkinson's disease (PD), with specific efficacy in reduction of heavily cross-linked mucus glycoproteins buildup. [11, 12]

Conclusion

It is never too early or too late to begin an initiative-taking brain health care regimen. Patients are encouraged to speak with their physician about the benefits of supplementing their daily routine with a brain health nutraceutical product such as this formulary available in capsule administration. Nicotinamide adenine dinucleotide (NAD+) and N-acetyl cysteine (NAC) are two important compounds likely to promote positive brain health, the former is a coenzyme that plays a role in cellular signaling, DNA repair, and metabolism while the latter is an antioxidant that supports liver detoxification and respiratory health.

References

[1] Wang, Y., Pan, Y., & Li, H. (2020). What is Brain Health and why is it important? *BMJ*, m3683. https://doi.org/10.1136/bmj.m3683. Retrieved June 24, 2024.

[2] Centers for Disease Control and Prevention. Healthy aging. What is a healthy brain? New research explores perceptions of cognitive health among diverse older adults. https://www.cdc.gov/aging/pdf/perceptions_of_cog_hlth_factsheet.pdf Retrieved April 1, 2024.

[3] Gorelick PB, Furie KL, Iadecola C, Smith EE, Waddy SP, Lloyd-Jones DM, Bae HJ, Bauman MA, Dichgans M, Duncan PW, Girgus M, Howard VJ, Lazar RM, Seshadri S, Testai FD, van Gaal S, Yaffe K, Wasiak H, Zerna C; American Heart Association/American Stroke Association. Defining Optimal Brain Health in Adults: A Presidential Advisory From the American Heart Association/American Stroke Association. Stroke. 2017 Oct;48(10):e284-e303. doi: 10.1161/STR.0000000000000148. Epub 2017 Sep 7. PMID: 28883125; PMCID: PMC5654545.

[4] Freeberg KA, Udovich CC, Martens CR, Seals DR, Craighead DH. Dietary Supplementation With NAD+-Boosting Compounds in Humans: Current Knowledge and Future Directions. J Gerontol A Biol Sci Med Sci. 2023 Dec 1;78(12):2435-2448. doi: 10.1093/gerona/glad106. PMID: 37068054; PMCID: PMC10692436.

[5] Suave AA. NAD+ and vitamin B3: from metabolism to therapies. *J Pharmacol Exp Ther.* 2008. March;324(3):883-93.

[6] Lee CF, et al. Targeting NAD+ Metabolism as Interventions for Mitochondrial Disease. *Sci Rep.* 2019. February 28;9(1):3073.

[7] Mokhtari V, Afsharian P, Shahhoseini M, Kalantar SM, Moini A. A Review on Various Uses of N-Acetyl Cysteine. Cell J. 2017 Apr-Jun;19(1):11-17. doi: 10.22074/cellj.2016.4872. Epub 2016 Dec 21. PMID: 28367412; PMCID: PMC5241507.

[8] Rajman L, Chwalek K, Sinclair DA. Therapeutic Potential of NAD-Boosting Molecules: The In Vivo Evidence. Cell Metab. 2018 Mar 6;27(3):529-547. doi: 10.1016/j.cmet.2018.02.011. PMID: 29514064; PMCID: PMC6342515.

[9] Radenkovic D, Reason, Verdin E. Clinical Evidence for Targeting NAD Therapeutically. Pharmaceuticals (Basel). 2020 Sep 15;13(9):247. doi: 10.3390/ph13090247. PMID: 32942582; PMCID: PMC7558103.

[10] Lamb DA, Moore JH, Mesquita PHC, Smith MA, Vann CG, Osburn SC, Fox CD, Lopez HL, Ziegenfuss TN, Huggins KW, Goodlett MD, Fruge AD, Kavazis AN, Young KC, Roberts MD. Resistance training increases muscle NAD^+ and NADH concentrations as well as NAMPT protein levels and global sirtuin activity in middle-aged, overweight, untrained individuals. Aging (Albany NY). 2020 May 5;12(10):9447-9460. doi: 10.18632/aging.103218. Epub 2020 May 5. PMID: 32369778; PMCID: PMC7288928.

[11] Tenório MCDS, Graciliano NG, Moura FA, Oliveira ACM, Goulart MOF. *N*-Acetylcysteine (NAC): Impacts on Human Health. Antioxidants (Basel). 2021 Jun 16;10(6):967. doi: 10.3390/antiox10060967. PMID: 34208683; PMCID: PMC8234027.

[12] Aldini G, Altomare A, Baron G, Vistoli G, Carini M, Borsani L, Sergio F. N-Acetylcysteine as an antioxidant and disulphide breaking agent: the reasons why. Free Radic Res. 2018 Jul;52(7):751-762. doi: 10.1080/10715762.2018.1468564. Epub 2018 May 9. PMID: 29742938.

Summary

Nicotinamide adenine dinucleotide (NAD+) and N-acetyl cysteine (NAC) are two important compounds likely to promote positive brain health, the former is a coenzyme that plays a role in cellular signaling, DNA repair, and metabolism while the latter is an antioxidant that supports liver detoxification and respiratory health. Increasing NAD+ levels improve insulin sensitivity, restore mitochondrial dysfunction, and promote increased lifespan, primarily through regulating healthy cellular homeostasis and metabolism. NAC serves essential functions associated with antioxidant and anti-inflammatory properties, attracted to repairing cellular redox imbalances, with robust ability to ameliorate damaging protein buildups and misfolding associated with many neurodegenerative diseases (Alzheimer's disease (AD), amyotrophic lateral sclerosis (ALS), and Parkinson's disease (PD). The constructive collaboration created by NAD+ and NAC combined formulary targets the brain as an organ for care and treatment, intended to optimize cognition, healthy function, and serve as a protective factor against harmful oxidative stress.