8T8™ Elite Energy Nutrition Stack for Increased Mental and Physical Performance

Dynamic Amino Acid Blend Energizes and Hydrates the Body and Brain

To be able to perform at your very best, both mentally and physically throughout the day or night; for work, for learning, for exercise, for sports, or for interacting at your very best with friends and family - you need to be well supported from within by high-quality, nutrition-based energy.

The stress that most people are exposed to on a daily basis will impair your cognitive functions such as focus, rationalization and decision-making. Stress can also drain your energy both emotionally and physically. This causes many people to reach for a sugary snack or a potent caffeine drink, however any temporary uplift from these, is soon after offset by an equal physical and mental energy crash.

This is why being energized from within through consuming high-quality nutrition is far superior, with health benefits that will go well beyond the 4-6 hours of enhanced energy… without added calories.

Recent scientific research indicates that the powerful ingredients selected for 8T8 can boost mind and body energy, enhance actual brain function, support fitness goals, and also help reduce stress.

This white paper presents the research behind the synergistic ingredients in this powerful formula, demonstrating how it can stimulate physical and mental energy, alertness, memory, and a positive mood. They will also help calm and reduce the effects of stress, support weight loss and help improve sleep.
Overall empowering individuals to make the most of their day!

Organic Ashwagandha

8T8 contains KSM-66® Organic Ashwagandha (*Withania somnifera*), a botanical shown to calm the mood, reduce stress, and support healthy cortisol levels.[1] Ashwagandha may also help reduce food cravings in individuals under stress, suggesting it can support weight management efforts.[2] Furthermore, ashwagandha contributes to refreshing sleep, likely due to its ability to reduce cortisol.[3] Another interesting benefit is ashwagandha's ability to reduce stress and frailty and improve quality of life in older adults.[4] Additionally, ashwagandha may enhance endurance and recovery in athletes, as noted in two studies that show it improves cardiorespiratory endurance in athletic adults.[5,6]

In addition to stress-relieving and energy-enhancing benefits, ashwagandha can support healthy aging and longevity. KSM-66 Ashwagandha has been shown to enhance telomerase activity in human cells.[7] Telomerase inhibits the loss of telomeres, the caps on the ends of chromosomes, which are degraded with age. Ashwagandha also extended the lifespan in Caenorhabditis elegans.[8] Its' healthy aging abilities extend to external benefits such as reducing signs of skin aging and hydrating the skin.[4]

Panax Ginseng

Ginseng is a botanical able to boost physical and mental energy and performance, as well as relieve stress and calm the mood. For example, in healthy, middle-aged adults, a single dose improved working memory performance,

including mental sharpness, clarity, concentration, and the ability to think.[9] In healthy young adults, ginseng has been shown to improve mood, promote feelings of calmness, and enhance math skills.[10] Furthermore, a meta-analysis of 630 participants found that ginseng has an energizing effect.[11]

Pyridoxal-5-Phosphate (P5P)

8T8 provides the bioactive form of B6 known as P5P. In individuals who are stressed, the elderly, and those with specific gene variants, the conversion of vitamin B6 from the diet to P5P does not occur efficiently. Supplementing with P5P eliminates the need for conversion in the body.

Optimal levels of P5P are associated with:
• Heart health and a healthy inflammatory response[12]
• Mood[13]
• Mental health and memory[14,15]
• Energy[16]
• A relaxed and calm mood[17]

Vitamin B12

Vitamin B12 is included in 8T8 due to its important role in energy production. People who are deficient in vitamin B12 are subject to fatigue.[18] Lower vitamin B12 levels also affect the mood.[19] In addition, vitamin B12 levels are essential for cognitive health.[20]

Amino Acids

The proprietary amino acid complex in 8T8 contains amino acids the body needs to perform its best. The benefits of these amino acids include enhancing brain function, alleviating stress, and improving endurance.

L-Phenylalanine

Phenylalanine found in 8T8 drive the production of the brain chemical (neurotransmitter) dopamine, which is involved in feelings of contentment. They also help the body make norepinephrine (noradrenaline) and epinephrine (adrenaline), neurotransmitters that increase focus and concentration. Stress can reduce levels of these vital brain chemicals.

L-phenylalanine works to help the body make vitally important brain chemicals. The body doesn't make phenylalanine on its own. That means you need to get it from food or supplements. The body converts L-phenylalanine into L-tyrosine and, in doing so, boosts levels of key neurotransmitters, such as mood-supporting dopamine and norepinephrine.[21] That's why, when you don't get enough phenylalanine in the diet, your mood may suffer, and you may become more irritable.

> Intense work schedules with long hours at the office can lead to unwanted pounds. In a study of overweight women, L-phenylalanine reduced food intake by 11%.[22]

L-phenylalanine may also improve the fat-burning effects of an exercise routine. In another study, supplementation with L-phenylalanine before exercising led to increased fat burning.[23]

Beta-Alanine

Beta-alanine is an amino acid present in the muscles and brain. It increases exercise and athletic performance.[24] It supports heart health during exercise and enhances muscle energy.[25] It combines with histidine to create the amino acid carnosine, which stops acid buildup after a workout.[26] A review of 23 separate studies found that in both athletes and non-athletes, beta-alanine supplementation reduces muscle fatigue and perceived exertion.[27]

In two other reviews, which included 18,000 people, beta-alanine enhanced exercise power and the amount of exercise participants could handle before exhaustion.[28,29] Beta-alanine worked best

in short-term, high-intensity exercise with a duration of 3 seconds to 10 minutes. Beta-alanine also enhanced repeated sprinting, jumping, and endurance in female soccer players.[28]

In a study of young, healthy soldiers, beta-alanine not only improved jumping ability but also led to greater accuracy in marksmanship and increased target engagement speed.[29]

Taurine

Almost every tissue in the body contains taurine, which is an antioxidant. But the heart, brain, retina, blood platelets, and glands are especially rich in this sulfur-containing, semi-essential amino acid.

Taurine is involved in a healthy inflammatory response.[30] This is important because high-stress levels can wreak havoc on this response system.

Taurine can also support weight management,[31] good news for people whose long work or study hours have led to putting on unwanted weight. In a double-blind, randomized study of overweight or obese college students, taurine supplementation reduced body weight and triglycerides.[31]

Another benefit of taurine? Helping meet exercise goals. The muscles need taurine to work their best.[32] A randomized, single-blind, placebo-controlled clinical trial of mostly male patients showed that after taurine supplementation, the study participants were able to exercise longer and farther.[33] Taurine levels in muscles drop after exercise. Supplementing with taurine post-exercise can help your body replenish this amino acid.[34]

Rodent studies also show taurine has a soothing effect on mood,[36] probably by interacting with the calming neurotransmitter GABA.[37]

If you're eating a vegetarian diet, it's even more important you supplement with taurine. These types of diets are deficient in this nutrient.[37]

Branched Chain Amino Acids

L-leucine, L-isoleucine, and L-valine are the branched-chain amino acids—BCAAs for short. Members of this trio are all essential to the body, which can't produce them on its own. Studies have found that BCAAs increase power output during exercise, reduce muscle soreness, improve energy levels, and enhance fat loss.[38] They also improve mental performance during exercise.[39]

After exercise, BCAAs levels drop quickly, and supplementation can restore those levels.[40]

In a recent study of strength-trained men, supplementing with BCAAs was more effective than using whey protein or carbohydrate supplements for increasing lean mass and muscle strength.[41] The BCAAs group also gained more strength compared to men using the other types of supplements.

L-Methionine

L-methionine is an essential amino acid. The body needs it to produce glutathione, an important antioxidant. L-methionine increases immune cell levels[50] and is therefore crucial for maintaining a well-functioning immune system. L-methionine also plays a starring role in methylation,[51] a process that acts like a switch to turn genes on and off. Optimal methylation is necessary for many areas of health, including production of DNA, creation of brain chemicals, detoxification, and many more. The need for this sulfur amino acid increases when the body is undergoing an inflammatory response.[50] An animal study also indicated the immune system, when stimulated, uses more methionine.[52] By making glutathione, L-methionine can shield your body from free radical attacks

that occur during times of less than optimal immunity.[50]
L-methionine can also help people cope with stress better. If a person's parents were stressed, it can lead to epigenetic changes in the way that person handles stress. These epigenetic changes affect DNA methylation and receptors for the stress-hormone cortisol. Methionine given to rats stops these and other negative effects.[53]

L-methionine can help support joint health. The body needs this sulfur amino acid to make glycosaminoglycans, the building blocks of cartilage.[54]

L-Threonine

Not to be confused with L-theanine, L-threonine is an amino acid that the body converts into glycine and serine, two other important amino acids that help the body make collagen and muscle tissue. It's an essential amino acid, so the body can't make it on its own. Stress at work and working long hours without getting enough sleep can lead to inflammation. In animal studies, L-threonine has promoted a healthy inflammatory response.[55]

People who exercise hard are often concerned about keeping their immune system healthy. In animal studies, L-threonine supports immunity.[56]

L-Histidine

This essential amino acid helps deliver oxygen to red blood cells.[57] If red blood cells don't get enough oxygen, energy levels drop. Histidine also helps increase focus. In a double-blind, randomized controlled trial, individuals experiencing fatigue and sleep disturbances showed improvements in cognitive function, including clearer thinking, enhanced attention, and improved memory, following histidine supplementation.[58] It also improved energy levels.[58]

Higher intake of histidine was linked to a healthy body mass index and less belly fat in a study of 2,376 people.[59]

Lysine

Lysine is a building block for protein and an essential amino acid. Your body cannot make it; therefore, you need to consume it actively. Lysine offers numerous benefits within the body. It is vital for muscle maintenance, the formation of carnitine, which is critical for mitochondrial energy production, and it helps transport fats across your cells to be burned for energy.[60,61]

Electrolytes

Hydration is critical to mental and physical performance, which is why 8T8 includes two vitally essential electrolytes: sodium and potassium. Being well-hydrated is known to impact both cognitive abilities and mood, as well as energy levels and hormonal, neurochemical, and vascular functions.[62,63]

Amino Acid	Mental Clarity	Physical Energy
Beta-Alanine	✓ Maintains focus under fatigue	✓ Buffers lactic acid, boosts endurance
Phenylalanine	✓ Dopamine precursor	✓ Boosts catecholamines
Theanine	✓ Relaxed alertness	—
Tryptophan	✓ mood (serotonin)	✓ Prevents fatigue
Histidine	✓ Wakefulness & carnosine	✓ Buffers fatigue
Leucine	✓ alertness via insulin & protein	✓ Stimulates muscle growth
Isoleucine	✓ Indirect fatigue reduction	✓ Energy & recovery
Valine	✓ Reduces serotonin-induced fatigue	✓ Protein support
Taurine	✓ Neurotransmitter modulation	✓ Supports endurance
Lysine, Methionine, and Threonine	✓ Protein/mood systems	✓ Recovery & metabolism

Science Research and Medical References:

1. Chandrasekhar K, Kapoor J, Anishetty S. A prospective, randomized double-blind, placebo-controlled study of safety and efficacy of a high-concentration full-spectrum extract of ashwagandha root in reducing stress and anxiety in adults. *Indian J Psychol Med.* 2012;34(3):255-262.
2. Choudhary D, Bhattacharyya S, Joshi K. Body Weight Management in Adults Under Chronic Stress Through Treatment With Ashwagandha Root Extract: A Double-Blind, Randomized, Placebo-Controlled Trial. *J Evid Based Complementary Altern Med.* 2017;22(1):96-106.
3. Salve J, Pate S, Debnath K, Langade D. Adaptogenic and Anxiolytic Effects of Ashwagandha Root Extract in Healthy Adults: A Double-blind, Randomized, Placebo-controlled Clinical Study. *Cureus.* 2019;11(12):e6466.
4. https://ksm66ashwagandhaa.com/science.php (pending studies under peer review)
5. Choudhary B, Shetty A, Langade DG. Efficacy of Ashwagandha (Withania somnifera [L.] Dunal) in improving cardiorespiratory endurance in healthy athletic adults. *Ayu.* 2015;36(1):63-68.
6. Tiwari S, Gupta SK, Pathak AK. A double-blind, randomized, placebo-controlled trial on the effect of Ashwagandha (Withania somnifera dunal.) root extract in improving cardiorespiratory endurance and recovery in healthy athletic adults. *J Ethnopharmacol.* 2021;272:113929.
7. Raguraman V. Withania somnifera Root Extract Enhances Telomerase Activity in the Human HeLa Cell Line. *Advances in Bioscience and Biotechnology.* 2016;7(4):199-204.
8. Kumar R, Gupta K, Saharia K, Pradhan D, Subramaniam JR. Withania somnifera root extract extends lifespan of Caenorhabditis elegans. *Ann Neurosci.* 2013;20(1):13-16.
9. Ossoukhova A, Owen L, Savage K, et al. Improved working memory performance following administration of a single dose of American ginseng (Panax quinquefolius L.) to healthy middle-age adults. *Hum Psychopharmacol.* 2015;30(2):108-122.
10. Reay JL, Scholey AB, Kennedy DO. Panax ginseng (G115) improves aspects of working memory performance and subjective ratings of calmness in healthy young adults. *Hum Psychopharmacol.* 2010;25(6):462-471.
11. Bach HV, Kim J, Myung SK, Cho YA. Efficacy of Ginseng Supplements on Fatigue and Physical Performance: a Meta-analysis. *J Korean Med Sci.* 2016;31(12):1879-1886.
12. Lotto V, Choi SW, Friso S. Vitamin B6: a challenging link between nutrition and inflammation in CVD. *Br J Nutr.* 2011;106(2):183-195.
13. Oxenkrug G, Ratner R, Summergrad P. Kynurenines and vitamin B6: link between diabetes and depression. *J Bioinform Diabetes.* 2013;1(1).
14. Tucker KL, Qiao N, Scott T, Rosenberg I, Spiro A, 3rd. High homocysteine and low B vitamins predict cognitive decline in aging men: the Veterans Affairs Normative Aging Study. *Am J Clin Nutr.* 2005;82(3):627-635.
15. Riggs KM, Spiro A, 3rd, Tucker K, Rush D. Relations of vitamin B-12, vitamin B-6, folate, and homocysteine to cognitive performance in the Normative Aging Study. *Am J Clin Nutr.* 1996;63(3):306-314.
16. Heap LC, Peters TJ, Wessely S. Vitamin B status in patients with chronic fatigue syndrome. *J R Soc Med.* 1999;92(4):183-185.
17. Mikawa Y, Mizobuchi S, Egi M, Morita K. Low serum concentrations of vitamin B6 and iron are related to panic attack and hyperventilation attack. *Acta Med Okayama.* 2013;67(2):99-104.
18. Alex Ankar AK. *Vitamin B12 Deficiency.* StatPearls Publishing; 2024.
19. Sangle P, Sandhu O, Aftab Z, Anthony AT, Khan S. Vitamin B12 Supplementation: Preventing Onset and Improving Prognosis of Depression. *Cureus.* 2020;12(10):e11169.
20. Köbe T, Witte AV, Schnelle A, et al. Vitamin B-12 concentration, memory performance, and hippocampal structure in patients with mild cognitive impairment. *Am J Clin Nutr.* 2016;103(4):1045-1054.
21. Lou HC. Dopamine precursors and brain function in phenylalanine hydroxylase deficiency. *Acta Paediatr Suppl.* 1994;407:86-88.
22. Pohle-Krauza RJ, Navia JL, Madore EY, Nyrop JE, Pelkman CL. Effects of L-phenylalanine on energy intake in overweight and obese women: interactions with dietary restraint status. *Appetite.* 2008;51(1):111-119.
23. Ueda K, Sanbongi C, Yamaguchi M, Ikegami S, Hamaoka T, Fujita S. The effects of phenylalanine on exercise-

induced fat oxidation: a preliminary, double-blind, placebo-controlled, crossover trial. *J Int Soc Sports Nutr.* 2017;14:34.
24. Hoffman J, Ratamess NA, Ross R, et al. Beta-alanine and the hormonal response to exercise. *Int J Sports Med.* 2008;29(12):952-958.
25. Berti Zanella P, Donner Alves F, Guerini de Souza C. Effects of beta-alanine supplementation on performance and muscle fatigue in athletes and non-athletes of different sports: a systematic review. *J Sports Med Phys Fitness.* 2017;57(9):1132-1141.
26. Hobson RM, Saunders B, Ball G, Harris RC, Sale C. Effects of β-alanine supplementation on exercise performance: a meta-analysis. *Amino Acids.* 2012;43(1):25-37.
27. Saunders B, Elliott-Sale K, Artioli GG, et al. β-alanine supplementation to improve exercise capacity and performance: a systematic review and meta-analysis. *Br J Sports Med.* 2017;51(8):658-669.
28. Rosas F, Ramírez-Campillo R, Martínez C, et al. Effects of Plyometric Training and Beta-Alanine Supplementation on Maximal-Intensity Exercise and Endurance in Female Soccer Players. *J Hum Kinet.* 2017;58:99-109.
29. Hoffman JR, Landau G, Stout JR, et al. β-alanine supplementation improves tactical performance but not cognitive function in combat soldiers. *J Int Soc Sports Nutr.* 2014;11(1):15.
30. Marcinkiewicz J, Kontny E. Taurine and inflammatory diseases. *Amino Acids.* 2014;46(1):7-20.
31. Zhang M, Bi LF, Fang JH, et al. Beneficial effects of taurine on serum lipids in overweight or obese non-diabetic subjects. *Amino Acids.* 2004;26(3):267-271.
32. Warskulat U, Flögel U, Jacoby C, et al. Taurine transporter knockout depletes muscle taurine levels and results in severe skeletal muscle impairment but leaves cardiac function uncompromised. *Faseb j.* 2004;18(3):577-579.
33. Beyranvand MR, Khalafi MK, Roshan VD, Choobineh S, Parsa SA, Piranfar MA. Effect of taurine supplementation on exercise capacity of patients with heart failure. *J Cardiol.* 2011;57(3):333-337.
34. Yatabe Y, Miyakawa S, Ohmori H, Mishima H, Adachi T. Effects of taurine administration on exercise. *Adv Exp Med Biol.* 2009;643:245-252.
35. Kong WX, Chen SW, Li YL, et al. Effects of taurine on rat behaviors in three anxiety models. *Pharmacol Biochem Behav.* 2006;83(2):271-276.
36. El Idrissi A, Boukarrou L, Heany W, Malliaros G, Sangdee C, Neuwirth L. Effects of taurine on anxiety-like and locomotor behavior of mice. *Adv Exp Med Biol.* 2009;643:207-215.
37. Stapleton PP, Charles RP, Redmond HP, Bouchier-Hayes DJ. Taurine and human nutrition. *Clin Nutr.* 1997;16(3):103-108.
38. Shimomura Y, Inaguma A, Watanabe S, et al. Branched-chain amino acid supplementation before squat exercise and delayed-onset muscle soreness. *Int J Sport Nutr Exerc Metab.* 2010;20(3):236-244.
39. Blomstrand E, Hassmén P, Ekblom B, Newsholme EA. Administration of branched-chain amino acids during sustained exercise--effects on performance and on plasma concentration of some amino acids. *Eur J Appl Physiol Occup Physiol.* 1991;63(2):83-88.
40. Shimomura Y, Murakami T, Nakai N, Nagasaki M, Harris RA. Exercise promotes BCAA catabolism: effects of BCAA supplementation on skeletal muscle during exercise. *J Nutr.* 2004;134(6 Suppl):1583s-1587s.
41. J S. Consuming a supplement containing branched-chain amino acids during a resistance-training program increases lean mass, muscle strength and fat loss. Poster Presentation. *J Int Soc Sports Nutr.* 2009;6(Suppl 1):P1.
42. Newsholme P. Why is L-glutamine metabolism important to cells of the immune system in health, postinjury, surgery or infection? *J Nutr.* 2001;131(9 Suppl):2515S-2522S; discussion 2523S-2514S.
43. Cetinbas F, Yelken B, Gulbas Z. Role of glutamine administration on cellular immunity after total parenteral nutrition enriched with glutamine in patients with systemic inflammatory response syndrome. *J Crit Care.* 2010;25(4):661.e661-666.
44. Ziegler TR, Young LS, Benfell K, et al. Clinical and metabolic efficacy of glutamine-supplemented parenteral nutrition after bone marrow transplantation. A randomized, double-blind, controlled study. *Ann Intern Med.* 1992;116(10):821-828.
45. Gleeson M. Dosing and efficacy of glutamine supplementation in human exercise and sport training. *J Nutr.* 2008;138(10):2045s-2049s.

46. Parry-Billings M, Budgett R, Koutedakis Y, et al. Plasma amino acid concentrations in the overtraining syndrome: possible effects on the immune system. *Med Sci Sports Exerc.* 1992;24(12):1353-1358.
47. Castell LM, Poortmans JR, Newsholme EA. Does glutamine have a role in reducing infections in athletes? *Eur J Appl Physiol Occup Physiol.* 1996;73(5):488-490.
48. Legault Z, Bagnall N, Kimmerly DS. The Influence of Oral L-Glutamine Supplementation on Muscle Strength Recovery and Soreness Following Unilateral Knee Extension Eccentric Exercise. *Int J Sport Nutr Exerc Metab.* 2015;25(5):417-426.
49. Klimberg VS, Souba WW, Dolson DJ, et al. Prophylactic glutamine protects the intestinal mucosa from radiation injury. *Cancer.* 1990;66(1):62-68.
50. Grimble RF. The effects of sulfur amino acid intake on immune function in humans. *J Nutr.* 2006;136(6 Suppl):1660s-1665s.
51. Waterland RA. Assessing the effects of high methionine intake on DNA methylation. *J Nutr.* 2006;136(6 Suppl):1706s-1710s.
52. Litvak N, Rakhshandeh A, Htoo JK, de Lange CF. Immune system stimulation increases the optimal dietary methionine to methionine plus cysteine ratio in growing pigs. *J Anim Sci.* 2013;91(9):4188-4196.
53. Weaver IC, Champagne FA, Brown SE, et al. Reversal of maternal programming of stress responses in adult offspring through methyl supplementation: altering epigenetic marking later in life. *J Neurosci.* 2005;25(47):11045-11054.
54. Nimni ME, Han B, Cordoba F. Are we getting enough sulfur in our diet? *Nutr Metab (Lond).* 2007;4:24.
55. Chen Y, Zhang H, Cheng Y, Li Y, Wen C, Zhou Y. Dietary l-threonine supplementation attenuates lipopolysaccharide-induced inflammatory responses and intestinal barrier damage of broiler chickens at an early age. *Br J Nutr.* 2018;119(11):1254-1262.
56. Mao X, Lai X, Yu B, et al. Effects of dietary threonine supplementation on immune challenge induced by swine Pseudorabies live vaccine in weaned pigs. *Arch Anim Nutr.* 2014;68(1):1-15.
57. Cho ES, Anderson HL, Wixom RL, Hanson KC, Krause GF. Long-term effects of low histidine intake on men. *J Nutr.* 1984;114(2):369-384.
58 Sasahara I, Fujimura N, Nozawa Y, Furuhata Y, Sato H. The effect of histidine on mental fatigue and cognitive performance in subjects with high fatigue and sleep disruption scores. *Physiol Behav.* 2015;147:238-244.
59. Li YC, Li CL, Qi JY, et al. Relationships of Dietary Histidine and Obesity in Northern Chinese Adults, an Internet-Based Cross-Sectional Study. *Nutrients.* 2016;8(7).
60. Almannai M, Alfadhel M, El-Hattab AW. Carnitine Inborn Errors of Metabolism. Molecules. 2019; 06;24(18) :3251.
61. Longo N, Frigeni M, Pasquali M. Carnitine transport and fatty acid oxidation. Biochim Biophys Acta. 2016; 863(10):2422-35.
62. Masento NA, Golightly M, Field DT, Butler LT, van Reekum CM. Effects of hydration status on cognitive performance and mood. *Br J Nutr.* 2014;111(10):1841-1852.
63. Von Duvillard SP, Braun WA, Markofski M, Beneke R, Leithäuser R. Fluids and hydration in prolonged endurance performance. *Nutrition.* 2004;20(7-8):651-656.