

# 40RE ENERGY & FOCUS (White Paper)

When performing a sport that requires as much physical and cognitive agility as golf, it is vital to fuel the body with the nutrients needed to excel. **40RE**, a medically formulated and natural nutritional supplement, is uniquely designed with golfers in mind, to provide more powerful effects than most other energy drinks. This report highlights each of the key nutrients within the **40RE** fusion supplement.

## **Energy and Cardiovascular Performance**

L-Citrulline and L-Arginine are naturally occurring amino acids that are found within various foods. When harnessed, these amino acids have been recognized to significantly improve blood flow and oxygenation to muscles during exercise by producing a molecule called nitric oxide [1]. Additionally, L-citrulline has demonstrated significantly reduced feelings of muscle fatigue and improved concentration after exercise [2]. One study suggests that the combination of L-citrulline and L-Arginine may be more beneficial than supplementing with L-arginine alone [3], indicating potential benefits in improving energy and cardiovascular performance while exercising. A derivative of L-arginine, known as agmatine sulfate, also has a significant ability to improve energy and vascular performance during exercise [4].

Another powerful aspect of this supplement is L-Carnitine Tartrate, a potent antioxidant which has demonstrated significant reductions in muscle fatigue and weakness after exercise. L-carnitine tartrate accomplishes this goal by preventing exercise-induced damage to muscles [5]. The inclusion of L-Glutamine is vital in preventing depletion of energy stores during exercise, thereby improving exercise performance [6]. There are several other core ingredients within this formulation that have been indicated to improve energy and cardiovascular performance, such as L-tyrosine, and L-theanine. L-tyrosine improves energy levels by stimulating key hormones involved in the immediate release of energy, while L-theanine prevents post-exercise fatigue and improves mental focus without stimulating stress hormones [7]. These functions of L-theanine provide smooth improvements in energy levels while decreasing the likelihood of a post-supplement "crash" [8].

# **Focus & Clarity**

Inositol is a vitamin-like molecule found in naturally high concentrations within the brain. One of the most well-known functions of inositol involves improving mental focus by increasing processing speeds within the brain and mental flexibility [9]. Choline DL-Bitartrate is another key ingredient that promotes focus and clarity during exercise by improving visuomotor performance (hand-eye coordination) [10].

Another focus-enhancing ingredient found in **40RE** Energy & Focus is Cordyceps Extract, which exerts a dual effect during exercise. Cordyceps extract promotes release of energy during prolonged exercise by utilizing fat stores, thereby increasing endurance and focus [11]. Like Cordyceps extract, Ganoderma extract has been shown to alter cellular metabolism during exercise by preventing muscle damage and fatigue through its antioxidant effects [12].

Another herbal extract, known as Bacopa Monnieri, has demonstrated promising results in improving cognitive performance, particularly in memory free recall [13]. There has also been increasing evidence that Lion's mane, a naturally found fungus, enhances brain processing speeds and can improve cognitive function [14]. Rhodiola rosea extract, another ingredient in this formulation, has demonstrated a promising ability to enhance performance, alleviate anxiety, and relieve muscle fatigue [15]. Altogether, these effects may promote focus and a state of calm while exercising.

**40RE Energy & Focus** also contains theobromine, a derivative of the cacao plant that has been shown to increase alertness [16]. The agents CoQ10 and DMAE L-bitartrate have also been include in the formulation. These ingredients have been implicated in enhancing brain performance by targeting various neurotransmitters and acting as antioxidants [17,18]. Finally, the inclusion of caffeine has been efficacious in increasing alertness and energy levels. In fact, one study found that moderate doses of caffeine significantly improve golf performance and reduce fatigue in golfers [19].

## Cellular Hydration & Support Matrix:

When golfing for prolonged periods of time, it is vital to ensure the body is optimally hydrated. There are certain minerals found within nutritional supplements that improve hydration by targeting electrolyte balance. Potassium citrate acts as a buffer to balance the body's pH through water and ion homeostasis. Similarly, Himalayan salt, magnesium L-aspartate and magnesium amino acid chelate can also promote adequate cellular hydration by causing cells to absorb water in order to preserve water balance [20]. Minerals that promote sugar metabolism during exercise include thiamine HCl, calcium carbonate, niacinamide and chromium picolinate [21]. Pyridoxine HCl supports the cell and prevents muscle fatigue during exercise by fostering the essential breakdown of protein into energy [22]. Methylcobalamin enhances cellular support and recovery following exercise by generating energy from fat stores and by optimizing the production of hemoglobin, a molecule which ensures that oxygen reaches the muscles [23].

Custom-made for golfers, **40RE** is a fusion of various extracts and vitamins that naturally help to amplify energy, performance, mental focus and hydration while golfing, so that you can play your best.

### References:

- 1. Gonzales, J., Raymond, A., Ashley, J. and Kim, Y. Does I-citrulline supplementation improve exercise blood flow in older adults?. *Experimental Physiology*, 2017;102(12), pp.1661-1671.
- 2. Suzuki T, Morita M, Kobayashi Y, Kamimura A. Oral L-citrulline supplementation enhances cycling time trial performance in healthy trained men: Double-blind randomized placebo-controlled 2-way crossover study. *J Int Soc Sports Nutr.* 2016;13:6. Published 2016 Feb 19. doi:10.1186/s12970-016-0117-z
- 3. Suzuki T, Morita M, Hayashi T, Kamimura A. The effects on plasma L-arginine levels of combined oral L-citrulline and L-arginine supplementation in healthy males. *Biosci Biotechnol Biochem*. 2017;81(2):372-375. doi:10.1080/09168451.2016.1230007

- 4. Xu W, Gao L, Li T, Shao A, Zhang J. Neuroprotective Role of Agmatine in Neurological Diseases. *Curr Neuropharmacol*. 2018;16(9):1296-1305. doi:10.2174/1570159X15666170808120633
- 5. Volek JS, Kraemer WJ, Rubin MR, Gómez AL, Ratamess NA, Gaynor P. L-Carnitine L-tartrate supplementation favorably affects markers of recovery from exercise stress. *Am J Physiol Endocrinol Metab*. 2002;282(2):E474-E482. doi:10.1152/ajpendo.00277.2001
- 6. Xiao D, Zeng L, Yao K, Kong X, Wu G, Yin Y. The glutamine-alpha-ketoglutarate (AKG) metabolism and its nutritional implications. *Amino Acids*. 2016;48(9):2067-2080. doi:10.1007/s00726-016-2254-8
- 7. Coull N, Chrismas B, Watson P, Horsfall R, Taylor L. Tyrosine Ingestion and Its Effects on Cognitive and Physical Performance in the Heat. *Med Sci Sports Exerc*. 2016;48(2):277-286. doi:10.1249/MSS.0000000000000757
- 8. Yoto A, Motoki M, Murao S, Yokogoshi H. Effects of L-theanine or caffeine intake on changes in blood pressure under physical and psychological stresses. *J Physiol Anthropol*. 2012;31(1):28. Published 2012 Oct 29. doi:10.1186/1880-6805-31-28
- Kalman D, Harvey PD, Perez Ojalvo S, Komorowski J. Randomized Prospective Double-Blind Studies to Evaluate the Cognitive Effects of Inositol-Stabilized Arginine Silicate in Healthy Physically Active Adults. *Nutrients*. 2016;8(11):736. Published 2016 Nov 18. doi:10.3390/nu8110736
- 10. Naber M, Hommel B, Colzato LS. Improved human visuomotor performance and pupil constriction after choline supplementation in a placebo-controlled double-blind study. *Sci Rep.* 2015;5:13188. Published 2015 Aug 14. doi:10.1038/srep13188
- 11. NAGATA, A., TAJIMA, T. and UCHIDA, M. SUPPLEMENTAL ANTI-FATIGUE EFFECTS OF CORDYCEPS SINENSIS (TOCHU-KASO) EXTRACT POWDER DURING THREE STEPWISE EXERCISE OF HUMAN. *Japanese Journal of Physical Fitness and Sports Medicine*, 2006;55(Supplement), pp.S145-S152.
- 12. Zhonghui Z, Xiaowei Z, Fang F. Ganoderma lucidum polysaccharides supplementation attenuates exercise-induced oxidative stress in skeletal muscle of mice. *Saudi J Biol Sci.* 2014;21(2):119-123. doi:10.1016/j.sjbs.2013.04.004
- 13. Pase MP, Kean J, Sarris J, Neale C, Scholey AB, Stough C. The cognitive-enhancing effects of Bacopa monnieri: a systematic review of randomized, controlled human clinical trials. *J Altern Complement Med.* 2012;18(7):647-652. doi:10.1089/acm.2011.0367
- 14. Brandalise F, Cesaroni V, Gregori A, et al. Dietary Supplementation of *Hericium erinaceus* Increases Mossy Fiber-CA3 Hippocampal Neurotransmission and Recognition Memory in Wild-Type Mice. *Evid Based Complement Alternat Med*. 2017;2017:3864340. doi:10.1155/2017/3864340
- 15. Ma GP, Zheng Q, Xu MB, et al. *Rhodiola rosea* L. Improves Learning and Memory Function: Preclinical Evidence and Possible Mechanisms. *Front Pharmacol*. 2018;9:1415. Published 2018 Dec 4. doi:10.3389/fphar.2018.01415
- 16. Mitchell ES, Slettenaar M, vd Meer N, et al. Differential contributions of theobromine and caffeine on mood, psychomotor performance and blood pressure. *Physiol Behav*. 2011;104(5):816-822. doi:10.1016/j.physbeh.2011.07.027
- 17. Stough C, Nankivell M, Camfield DA, et al. CoQ<sub>10</sub> and Cognition a Review and Study Protocol for a 90-Day Randomized Controlled Trial Investigating the Cognitive Effects of Ubiquinol in the Healthy Elderly. *Front Aging Neurosci*. 2019;11:103. Published 2019 May 29. doi:10.3389/fnagi.2019.00103
- 18. Malanga G, Aguiar MB, Martinez HD, Puntarulo S. New insights on dimethylaminoethanol (DMAE) features as a free radical scavenger. *Drug Metab Lett.* 2012;6(1):54-59. doi:10.2174/187231212800229282

- 19. MUMFORD, P., TRIBBY, A., POOLE, C., DALBO, V., SCANLAN, A., MOON, J., ROBERTS, M. and YOUNG, K. Effect of Caffeine on Golf Performance and Fatigue during a Competitive Tournament. *Medicine & Science in Sports & Exercise*, 2016;48(1), pp.132-138.
- 20. Zorbas YG, Kakurin VJ, Kuznetsov NA, Yarullin VL. Fluid and salt supplementation effect on body hydration and electrolyte homeostasis during bed rest and ambulation. *Acta Astronaut*. 2002;50(12):765-774. doi:10.1016/s0094-5765(02)00012-7
- 21. Shirreffs, S. Hydration in sport and exercise: water, sports drinks and other drinks. *Nutrition Bulletin*, 2009;34(4), pp.374-379.
- 22. Cui J, Leuenberger UA, Blaha C, King NC, Sinoway LI. Effect of P2 receptor blockade with pyridoxine on sympathetic response to exercise pressor reflex in humans. *J Physiol*. 2011;589(Pt 3):685-695. doi:10.1113/jphysiol.2010.196709
- 23. Troen AM. Folate and vitamin B12: function and importance in cognitive development. Nestle Nutr Inst Workshop Ser. 2012;70:161-71. doi: 10.1159/000337684. Epub 2012 Aug 31. PMID: 25825305.