



WIKI

Knowledge Base



WORKWIZE WIKI

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1. INTRODUCTION

Fatigue is complex and driven by a multitude of processes in the human body, however, it is typically considered to be predominantly driven by the depletion of the catecholamine neurotransmitters. The catecholamine neurotransmitters are dopamine, noradrenaline and adrenaline. The body uses these neurotransmitters for motor function, concentration and motivation (via the dopamine reward system). The nutrients used to produce the catecholamine neurotransmitters are tyrosine and phenylalanine. When the levels of these precursor nutrients run low, your brain can't make the neurotransmitters required to keep you alert and motivated and you feel depleted and fatigued. EndurAID is specially formulated to replenish these nutrients and to hydrate and energise your brain.



EndurAID fights fatigue with a combination of a Nootropic stack blended with electrolytes and energy creating vitamins and nutrients. The Nootropic blend of amino acids is designed to replenish the catecholamine neurotransmitters to fight fatigue at the biochemical source. A blend of chelated electrolytes rehydrates and replenishes what sweat takes out. A vitamin stack of C, B5, B6 and B12 promotes metabolic function and neurotransmitter production. And

a synergistic blend of micronized creatine and acetyl carnitine promotes cellular energy production and utilisation through the ATP pathway.

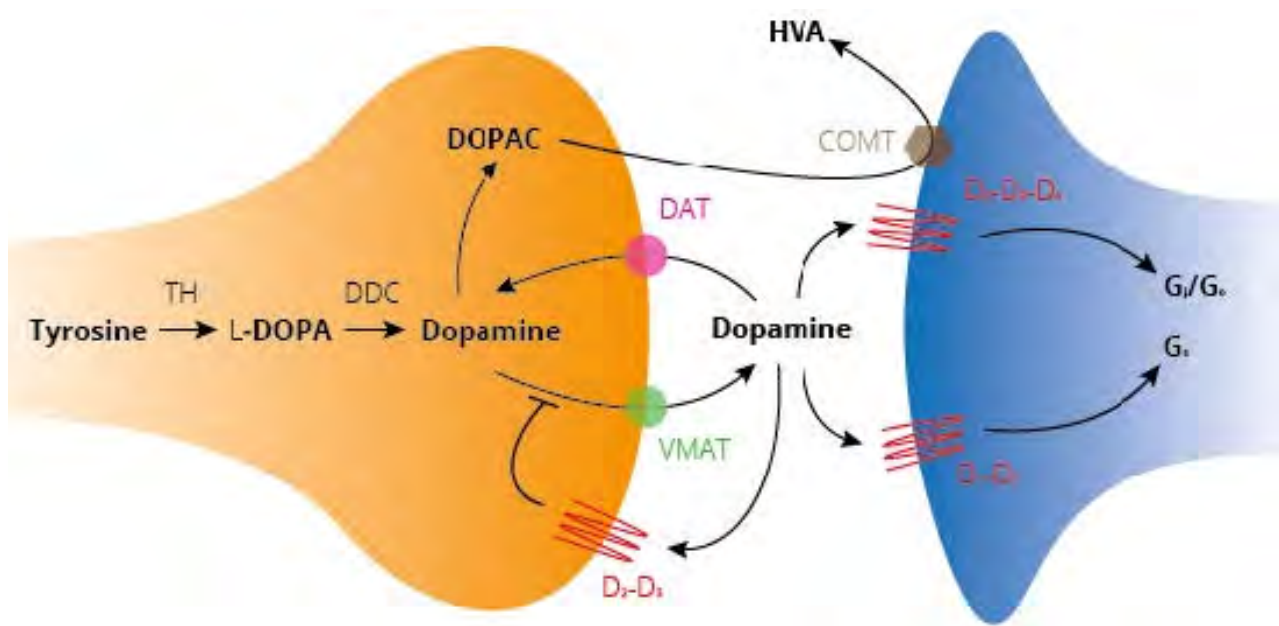
The human brain is a complex organ that coordinates, monitors and actuates your entire body. In a typical human brain there are around 100 billion neurons. Each of these neurons needs specific nutrients to work effectively. EndurAID has been specially developed to replenish the nutrients your brain uses to maintain focus, motivate you to work, combat fatigue and keep you hydrated.





2. NEUROTRANSMISSION

The brain communicates to the body by sending signals through neurons in a process called neurotransmission. Neurotransmission relies on chemicals called neurotransmitters, which are created in the neuron from precursor nutrients which must cross the blood brain barrier (BBB) and reside in the brain. The catecholamine neurotransmitters, dopamine and norephedrine keep you focused, alert and motivated while serotonin calms you down, regulates mood and promotes drowsiness.



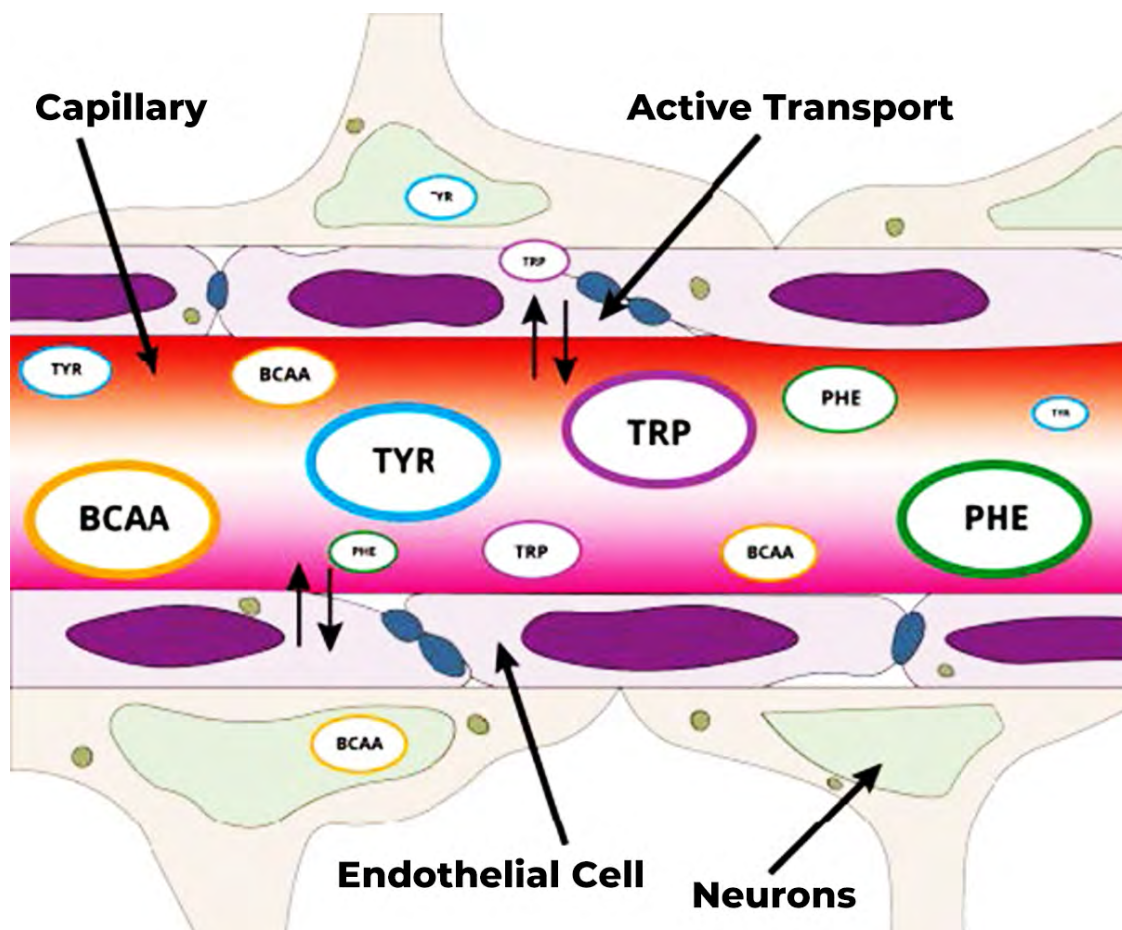
Tyrosine Hydroxylase and Dopamine Synthesis





3. BLOOD BRAIN BARRIER (BBB)

The BBB is a selective semi-permeable membrane that is responsible for transporting nutrients from the blood to the brain. The precursor nutrients for the catecholamines and serotonin are Phenylalanine/Tyrosine (PHE/TYR) and Tryptophan (TRP) respectively, they are both amino acids found in most proteins. They share a competitive uptake mechanism in the BBB with several other amino acids including the BCAA's. This competitive action means that if serum levels of TYR/PHE/BCAA decrease, then TRP transport and therefore serotonin production will increase (Choi, et al., 2013). As serotonin production increases, feelings of fatigue will arise.



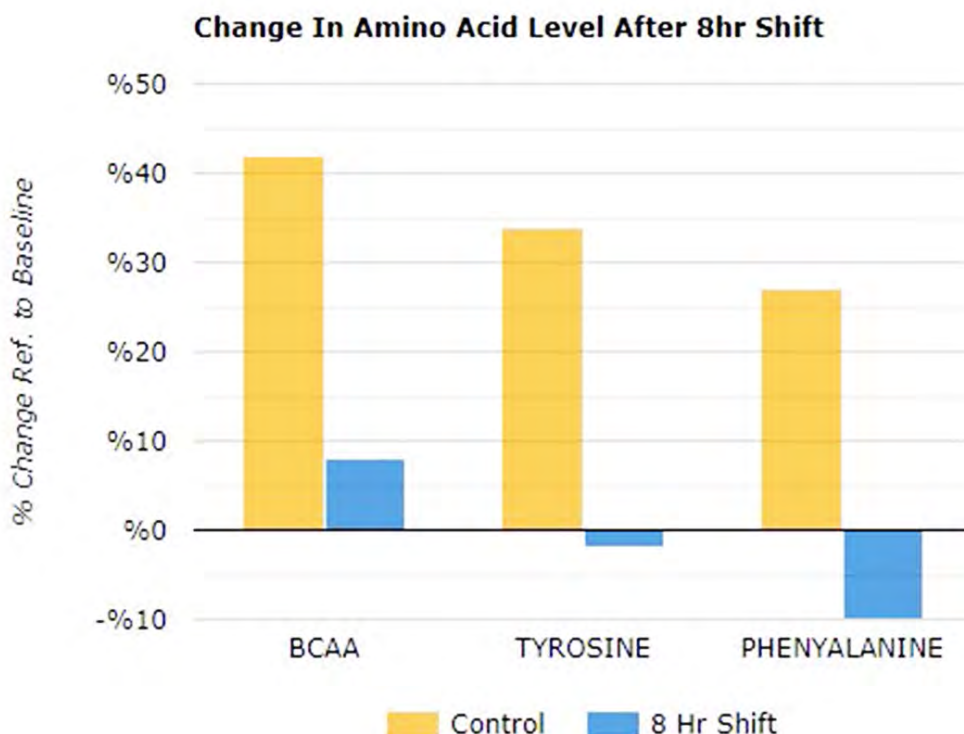
Amino Acids in serum passing through cerebral capillary.



4. PRECURSOR NUTRIENTS

After physical or mental exercise, these precursor nutrients TRY/PHE/BCAA are consumed. The level of catecholamines drops and thus the level of serotonin rises. This is a process known as central nervous system fatigue. Central fatigue, as it is known, affects all physical and mental abilities, including strength, speed, reaction time, coordination, decision making, and balance. It worsens with time until the neurotransmitter level is restored. Research has shown that after an 8 hour shift of office work serum amino acid levels can drop up to 40%

(Tanaka, et al., 2007). These levels can stay low even after a full night's sleep and adequate food (Tanaka, et al., 2007). This deficit likely compounds during shift work and extended hours. Leading to an increasing level of fatigue.



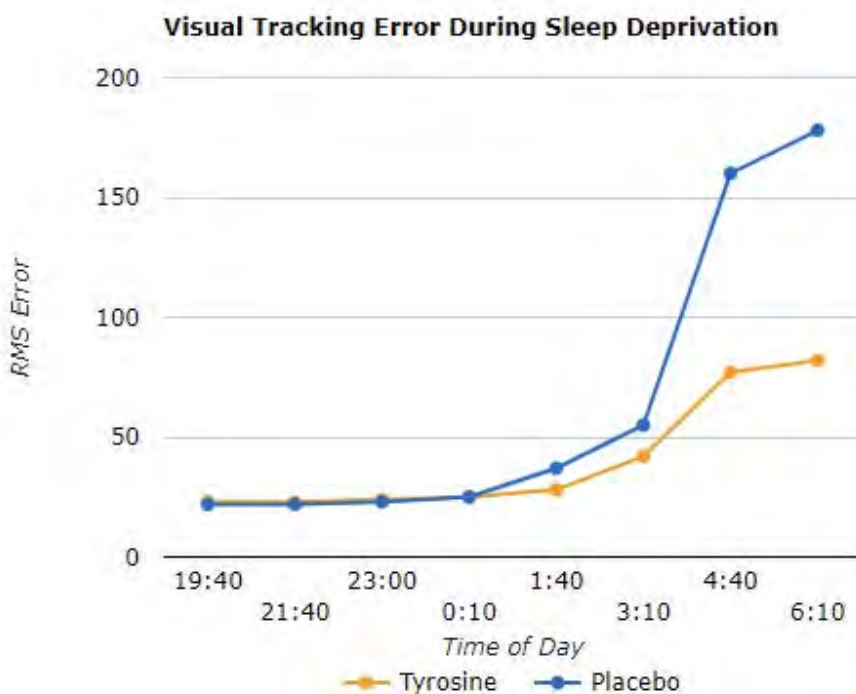
Change in serum amino acid level after 8 hours relative to baseline. The control group had 8 hours of relaxation while the work group had simulated mental workload (Tanaka, et al., 2007).





5. SUPPLEMENTATION

Supplementation of the precursor amino acids has been shown to effectively increase serum levels which enables the brain to produce the vital neurotransmitters required to combat the onset of fatigue. Studies have shown that supplementation of both Tyrosine and the BCAA's effectively regulate the change in neurotransmitter concentration characteristic of fatigue, due to sleep deprivation and stressors such as heat and cold (Mahoney, et al., 2007). Studies of Tyrosine supplementation have shown it can dramatically reduce the impacts of sleep deprivation on concentration and vigilance scales (Wiegmann & Shappell, 1993). Phenylalanine is converted by the body to Tyrosine, supplementation of Phenylalanine can allow for a longer lasting supply of Tyrosine in the body.



Error in a Compensatory Tracking Task during cadets subjected to sleep deprivation. This tracking task is similar to driving or monitoring processes on screen (Wiegmann & Shappell, 1993)





6. BENEFITS

EndurAID is a revolution in workplace nutrition that combines modern research in neurochemistry and sports science to deliver a Nootropic electrolyte drink designed to enhance the safety and performance of workers in tough conditions. By replenishing several key nutrients in the brain EndurAID can offer many benefits.



6.1. REDUCED MENTAL & PHYSICAL FATIGUE

Tyrosine and BCAA have been shown to combat fatigue by replenishing the body's store of catecholamines, which are used for mental alertness and concentration. And by directly halting the mechanism of central fatigue by regulating the uptake of tryptophan which can be increased when BCAA and Tyrosine serum levels drop (Choi, et al., 2013), (Blomstran, 2006).

6.2. IMPROVED HYDRATION

EndurAID is a *hypotonic* electrolyte drink enhanced with amino acids. The addition of amino acids to hydration fluid has been shown to enhance fluid absorption and retention over that of an electrolyte mix or water alone (Adibi, 1970).





6.3. IMPROVED MOOD

Tyrosine and Phenylalanine are both precursor nutrients to several neurotransmitters which are responsible for motivation and mood regulation. Supplementing the body's supplies means less mood degradation due to tough working conditions or excessive caffeine intake (*Banderet & Lieberman, 1988*).

6.4. INCREASED ENERGY

EndurAID contains creatine and carnitine. Both are used by the body to deliver energy into cells. Creatine is used by both the brain and skeletal muscles to produce energy. It has been shown to increase power output in athletes and fuel the brain in those suffering from fatigue (*Watanabe, et al., 2002*).

Carnitine has been shown to increase the availability of creatine and glucose use in the brain (*Smeland, et al., 2012*).





6.5. IMPROVED ALERTNESS & FOCUS

Tyrosine has been shown to increase cognition, alertness and memory in individuals suffering from sleep deprivation or under physical stress (*Wiegmann & Shappell, 1993*). Carnitine has been shown to increase acetylcholine, (a neurotransmitter) production in the brain which is used to concentrate and form logical thought (*Ando, et al., 2001*).

6.6. DECREASED STRESS

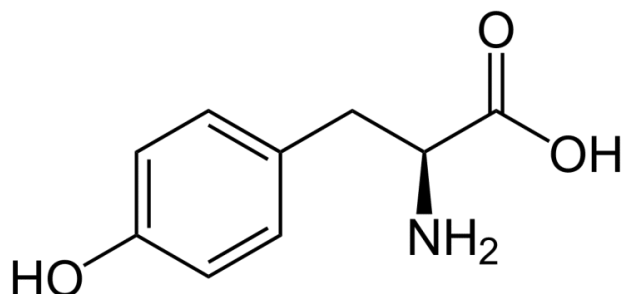
Tyrosine has been shown to decrease symptoms, adverse moods and performance impairments due to stressors such as sleep deprivation, stress, heat and cold (*Deijen, et al., 1999*). Additionally, B vitamins are vital for energy production and countless enzymatic processes in the human body. They help the human body deal with stress (*Kennedy, et al., 2010*).





7. INGREDIENTS

EndurAID is a premium blend of amino acids, vitamins, electrolytes and nutrients specifically formulated to help you achieve optimal performance during a busy workday. EndurAID is sugar free and coloured and flavoured with only natural fruit extracts and organic stevia.



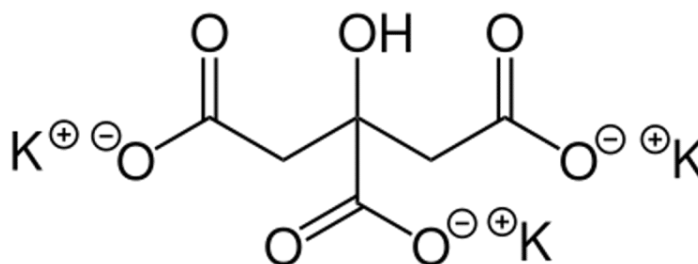
7.1. AMINO ACIDS

EndurAID contains; Tyrosine, Phenylalanine, Glycine and the Branched Chain Amino Acids (BCAA's)(Leucine, Isoleucine and Valine). Tyrosine and Phenylalanine are converted to Catecholamines

which keep the brain motivated, alert and active. The BCAA's are used in energy production and supplementation can reduce fatigue. Glycine is utilised by the body in a multitude of functions. Consumption can assist brain health and help mitigate fatigue.

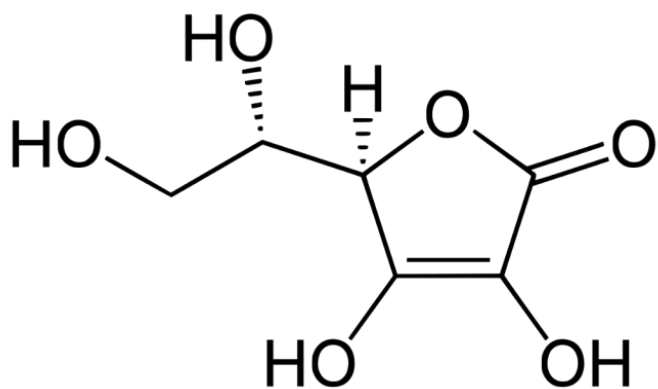
7.2. ELECTROLYTES

EndurAID contains all the major electrolytes needed by the human body; Sodium, Potassium, Chloride, Magnesium and Calcium, all in chelated



form for optimal bioavailability. The human body requires the presence of electrolytes in its serum and cellular fluids to enable signal transduction, to regulate osmotic gradients and for enzymatic reactions. Electrolytes are lost in sweat and need to be replenished.





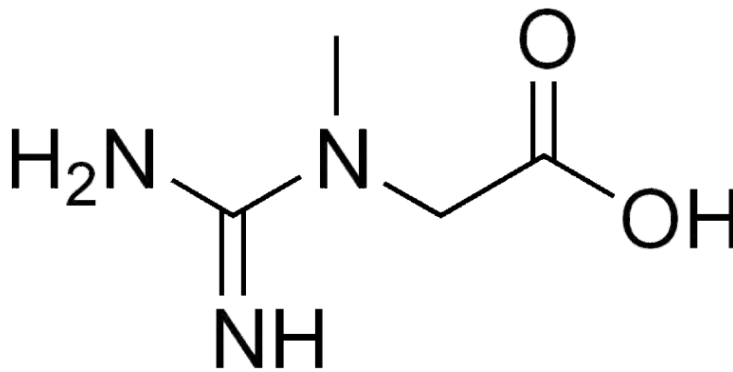
7.3. VITAMINS

The vitamin formulation in EndurAID has been designed to replenish the supply of vitamins used by the brain for cognitive function. EndurAID contains Vitamins C, B5, B6 and B12, all essential for countless

enzymatic reactions, immune function, energy generation and neurotransmitter production. They are consumed by the body and need constant replenishment.

7.4. NUTRIENTS

EndurAID contains the vital nutrients Creatine and Carnitine to facilitate energy production. Creatine is an endogenous molecule vital to energy production in the human body by recycling cellular adenosine triphosphate (ATP). Carnitine is another endogenous nutrient that is linked to the conversion of fatty acids to energy by mitochondria.





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