



designs for health®

PRETRAIN NRG™

PRE-WORKOUT FORMULA TO SUPPORT FOCUS, POWER, AND MENTAL ENERGY FOR OPTIMAL SPORTS PERFORMANCE

180 G POWDER | NPN80077347 | PRTRNG-CN

PreTrain NRG™ powder is a specific pre-workout formula providing beneficial nutrients to help support focus, power, and mental energy in athletes. There is no question that intense, prolonged training puts a significant stress on the central nervous system; thus, providing nutrients which optimize brain function may be highly beneficial to the performance of an athlete. PreTrain NRG™ features tyrosine, acetyl L-carnitine and caffeine to help increase focus and energy, while creatine is included to improve strength. Adenosine-5'-triphosphate (as Peak ATP®) is an important compound in this formula, as it helps to increase strength, power, and recovery as well as reduce fatigue, enabling a greater amount of reps and sets. PreTrain NRG™ powder has a pleasant tasting, natural strawberry flavour and is sweetened with natural stevia leaf extract.

BENEFITS:

- Helps to relieve fatigue
- Helps promote endurance
- Helps enhance motor performance
- Helps support cognitive health
- Helps support brain function

RATIONALE FOR PRETRAIN NRG™ FORMULATION

Nutrients for supporting focus, energy, and endurance in athletes are essential. Choosing the right nutrition supplements can have a significant impact on what can be achieved during training.

While pre-workout supplements have gained tremendously in popularity, most stimulate the sympathetic nervous system and usually have high doses of caffeine. While there is nothing wrong with small amounts caffeine, numerous pre-workout supplements on the market contain as much caffeine as five cups of coffee. Pre-workout supplements provide increased energy and endurance for one's workout; however, there are several issues to consider when choosing the appropriate nutrients for these purposes. Many commercial products can put a heavy burden on the adrenal glands, which increases the stress response and can lead to fatigue. They can also cause other negative side effects such as sleep disturbances, irritability and anxiousness, and can negatively impact appetite.

In addition, many of these products also contain food dyes and artificial sweeteners, with most powders being sweetened with sucralose. While food manufacturing companies and global health authorities have deemed sucralose safe for consumption, most health care providers know that this is not the case. According to a recent study in the *Journal of Toxicology and Environmental Health*, sucralose is a biologically active compound that decreases the number and balance of beneficial bacteria in the gastrointestinal tract. It causes epithelial scarring, the depletion of goblet cells and glandular disorganization in the colon, and alters insulin, blood glucose, and glucagon-like peptide 1 (GLP-1) levels.¹

When it comes to performance, in addition to physical ability, an athlete's psychological stability during training and competition must also be considered, including their nervous system and their ability to perform under stressful conditions. Mental performance and physical performance are interconnected, whether it be reaction time, mood or focus. All of these cognitive processes should be optimal if one wants to perform their best. Therefore, carefully selected brain nutrients taken pre-workout can significantly help to increase performance in the gym. These nutrients stimulate the brain and not the adrenal glands. As a result, they provide energy, drive, and mental focus without negative side effects, while also offering long term benefits to overall health.

HIGHLIGHTS

Acetyl L-Carnitine

Acetyl L-Carnitine (acetylated form of L-carnitine, often referred to as ALCAR) is one of the most researched brain nutrients which has been shown to quickly enhance mental focus and energy. Acetyl L-carnitine has a similar structure to acetylcholine, and therefore, it can stimulate acetylcholine receptors in the brain. The acetyl group allows it to cross the blood brain barrier, which does not occur with L-carnitine. Thus, acetyl L-carnitine will support the brain as well as offer all the benefits of L-carnitine.

L-Carnitine is abundant in animal muscle tissue, including red meat. Its main function is to transport fatty acids across the mitochondrial membrane for fatty acid oxidation. Skeletal and cardiac tissues rely heavily on fatty acid oxidation and have high concentrations of carnitine.² Supplementation of carnitine has been studied in many areas including metabolism, cardiovascular disease, and sports enhancement.³

L-Carnitine has been shown to improve exercise performance by enhancing the delivery of fat fuel to the muscles. It has also been shown to increase the anaerobic threshold, delaying the event where the muscles feel a "burn" from lactic acid.⁴

Acetyl L-carnitine is mostly associated with preventing age-related memory decline and slowing Alzheimer's disease; however, it is also very effective when used pre-workout for increasing mental focus and energy. ALCAR increases dopamine which enhances focus and motivation. It is a nutrient in which an increase in focus and energy is quickly felt, within approximately 15 - 20 minutes after ingesting. This effect is best achieved with 1500 mg taken 30 minutes prior to training. This also happens to be the dosage at which the reversal of many of the signs of brain aging occurs.⁵ In addition, there are no side effects, only long term benefits on overall brain health.

A study published in Cell Metabolism specifically related to exercise demonstrated that ALCAR plays an important role in modulating muscle energy during muscle contraction as well as decreasing muscle fatigue and reducing exercise intolerance.⁶

N-Acetyl-L-Tyrosine

N-acetyl-L-tyrosine is the acetylated derivative of L-tyrosine. Tyrosine is a non-essential amino acid synthesized in the body from the essential amino acid phenylalanine. Tyrosine is the precursor amino acid from which the body makes thyroid hormone and dopamine, which is then converted to norepinephrine and then to epinephrine. Inadequate production of these hormones and catecholamines can compromise physical performance. These catecholamines regulate the stress response and are involved in basic nervous system activities, such as movement, memory, attention, desire, motivation, "fight or flight" response, heart rate, and energy production.⁷

Acetylation helps to increase the stability and solubility of tyrosine. This makes tyrosine more bioavailable and efficient, and as a result, it is a superior choice for increasing the body's levels of tyrosine. It is essential for numerous functions such as cognitive performance,⁸ improving stamina for exercise,⁹ and preventing excessive rises in cortisol levels.¹⁰

N-acetyl-L-tyrosine helps support optimal sports performance for the body and the brain by alleviating stress and stimulating the brain, as well improving workout intensity while preventing overtraining. This is essential for competitive athletes who have to perform at a high level. Tyrosine is a stimulating amino acid supplement that can be a good alternative to caffeine. It is best taken on an empty stomach.

Adenosine-5'-Triphosphate (as PEAK ATP®)

ATP is an energy-carrying molecule used in cells whose role as the primary intracellular energy source for body tissues is well established. Extracellular ATP, however, is just as important as intracellular ATP. Orally delivered ATP (which increases extracellular ATP) may help reduce muscle fatigue and enable a higher force output during repeated high-intensity bouts of exercise, these attributes being independent of intracellular ATP's function as the body's main energy supplier. Blood levels of ATP are responsible for controlling muscle excitability, vasodilation, and anabolic signaling. Extracellular ATP increases calcium (the main nutrient responsible for muscle contraction) and glucose levels within the cells. Also, when intracellular calcium levels increase, there is also an increase in the number of muscle filaments binding and the velocity at which these muscle filaments slide to create a contraction.¹¹

Numerous studies have demonstrated ATP's ability to increase strength and power, support recovery, and reduce fatigue. Specifically, extracellular ATP directly promotes the increased synthesis and release of nitric oxide (NO) and prostacyclin (PGI₂) within skeletal muscle and therefore directly affects tissue vasodilation and blood flow.¹² Research suggests that oral supplementation with ATP in combination with high intensity resistance training increases muscle mass, strength, and power. In addition, it has the ability to speed recovery, which may prevent typical declines in performance and provide athletes with a novel method to promote positive training adaptations.¹³

Research has also demonstrated that 400 mg of ATP taken daily on an empty stomach 30 to 60 minutes prior to training to be most effective for increasing power, strength, and vasodilation.

A study from the University of Tampa demonstrated ATP's effect on increasing vasodilation and blood flow post-exercise. In this study, twelve college-aged, resistance trained males were randomly divided into ATP and no ATP groups. Four hundred milligrams of ATP were taken daily for twelve weeks 30 minutes prior to weight training. At weeks 1, 8, and 12 there were significant differences in blood flow at zero and three minutes post exercise. This research demonstrates that oral ATP can increase blood flow during exercise recovery.¹⁴

In another study, 400 mg ATP taken daily for 15 days reduced muscle fatigue while improving muscle low peak torque through successive sets of exercise. These effects indicate an improvement in overall training stimulus which may have been brought about by more rapid repolarization and stronger action potentials later within sets.¹⁵

L-Theanine and Caffeine (from Green Coffee)

The combination of L-theanine and caffeine in a 2:1 ratio stimulates and boosts mental alertness. Together they provide a clean and calm focus without any jitters or hard crashes that are often seen after consuming products containing caffeine.

CLINICAL CONSIDERATION

PreTrain NRG™ works well synergistically with other Designs for Health sports performance supplements such as NOx Synergy™, GPC liquid, and BCAA Powder with L-Glutamine.

Medicinal Ingredients (per 9 g):

Acetylcarnitine ((2R)-2-(Acetyloxy)-3-carboxy-N,N,N-trimethyl-1-propanaminium inner salt, N-Acetyl L-carnitine hydrochloride) ...	1.5 g
Creatine (N-Methyl-N-guanylglycine, Magnesium creatine chelate)	1.1 g
N-Acetyl-L-tyrosine (2-acetyl-amino-3-(4-hydroxyphenyl)-propanoic acid, N-Acetyl tyrosine).....	750 mg
Adenosine triphosphate disodium (Adenosine 5'-(tetrahydrogen triphosphate), disodium salt)	400 mg
L-Theanine	200 mg
Magnesium (Magnesium creatine chelate)	200 mg
Caffeine (1,3,7-Trimethylxanthine, Caffeine, <i>Coffea canephora</i> - Seed)	100 mg

Non-Medicinal Ingredients: Natural flavours, partially hydrolyzed guar gum, L-leucine, citric acid, stevia leaf reb M, luo han guo extract blend. **Recommended Dose:** Adults: Mix 9 grams (approx. one scoop) in 8 oz of water and consume 30-45 minutes before a workout or as directed by a health care practitioner. Dosing recommendations are given for typical use based on an average 150 pound healthy adult. Healthcare practitioners are encouraged to use clinical judgement with case-specific dosing based on intended goals, subject body weight, medical history, and concomitant medication and supplement usage.