

## THE KEY XPEDITE INGREDIENTS AND REFERENCES

### R-LIPOIC ACID JUMPSTARTS ENERGY FOR WORKOUTS

XPEDITE contains a potent ingredient called R-Lipoic Acid or R-LA, which is not included in the lion's share of the pre-workout/energy products available. Some researchers believe R-LA may eventually be acknowledged as one of the most important nutraceutical compounds on the market for cellular energy production. R-Lipoic acid has properties that make it especially valuable for athletes. It improves the body's utilization of glucose and may increase the body's production of adenosine triphosphate (ATP) within the muscle cells.

Mitochondria produces most of the cellular energy used by the body and R-LA is the only form of lipoic acid that functions as a cofactor for mitochondrial enzymes. Although R-LA is a more expensive form, it has been shown to be many times more effective than the more commonly used racemic alpha lipoic acid or ALA. It's equally important to note that R-LA improves insulin sensitivity and accelerates the metabolic rate, which may help reduce the gain in body fat with aging (1, 2).

R-LA is more commonly known for its powerful and universal antioxidant functions since it is both water and fat soluble. R-LA also increases or maintains the levels of other potent antioxidants including coenzyme Q10, vitamin C, vitamin E and glutathione (3-5). Anyone who does intense exercise needs to take powerful antioxidants to combat the free radical damage from the oxidative stress and to facilitate muscle recovery.

Additionally, biotin is included in the XPEDITE formula because it enhances the absorption of R-LA. Biotin is a natural co-factor that compliments R-LA in promoting cellular energy for muscular endurance and improved workout performance. Likewise, this scientific formula contains both taurine and L-carnitine, which further supports the optimal blood sugar levels needed during high-intensity exercise. As a bonus, these ingredients support fat loss by increasing glucose uptake by muscle tissue, which helps to prevent fat cell deposition.

### TYROSINE ENHANCES COGNITIVE FUNCTION

XPEDITE contains the amino acid tyrosine, which is a precursor of the brain neurotransmitters epinephrine (adrenalin), norepinephrine and dopamine, which transmit nerve impulses. Dopamine is vital to mental function. U.S. soldiers undergoing various psychological and physiological stress tests were given tyrosine to measure its effects on performance. The researchers found that the soldiers who took tyrosine performed significantly better on a variety of tests compared to those who took a placebo. They were more efficient, alert and had faster reaction times (6). Studies have also shown that tyrosine can considerably reduce fatigue, muscular discomfort and sleepiness (7, 8).

## L-CARNITINE L-TARTRATE IMPROVES VO2MAX AND EXERCISE RECOVERY

There is a lot of research examining the potential of carnitine supplementation to spare muscle glycogen and improve exercise performance (9, 10). The L-carnitine L-tartrate form contained in XPEDITE has been found to effectively assist in muscle recovery from high-repetition squat exercise. Researchers found the beneficial effects of carnitine on exercise recovery responses to include improved blood flow and reduced free radical formation, tissue damage and muscle soreness (11).

The positive effects of carnitine on aerobic work capacity or VO2 max has also been demonstrated in studies involving various types of athletes (12, 13). One of the consequences of high-intensity training is hypoxia (low blood oxygen), which increases the concentration of the metabolic waste byproduct ammonia (14). Ammonia accumulation is associated with muscle fatigue and L-carnitine L-tartrate has been found to decrease athletes' ammonia levels in a well controlled study (15).

## CITRULLINE MALATE PROMOTES AEROBIC ENERGY PRODUCTION

Citrulline malate has been shown to promote aerobic energy production by buffering lactic acid buildup and reducing fatigue. European studies have shown that it significantly reduces mental and physical fatigue and exhaustion (16).

Research indicates that citrulline malate may boost athletic performance and recovery by accelerating the elimination of the toxic byproducts of protein metabolism and improving the capacity of the liver to remove ammonia and lactate from the blood (17, 18). Also, citrulline is converted to arginine, which is the precursor for nitric oxide (NO<sub>2</sub>), a key cellular signaling molecule (19). Increasing NO<sub>2</sub> levels induces the relaxation of smooth muscle cells in the walls of blood vessels resulting in vasodilation and increased blood flow.

## BETA-ALANINE ATTENUATES FATIGUE FOR MORE TRAINING VOLUME

Beta-alanine is a precursor of carnosine, which is a di-peptide that is concentrated in muscle and brain tissue. Carnosine regulates important aspects of cell metabolism and may provide stamina and energy-enhancement benefits. Athletes use beta-alanine to support optimal carnosine production, which plays a role as an acid buffer within muscle cells and attenuates fatigue (20). A study conducted in 2008 found that beta-alanine supplementation increased training volume and reduced subjective feelings of fatigue in college football players (21).

Researchers have also shown that carnosine has a number of beneficial anti-oxidant properties including hydroxyl-radical-scavenging and lipid-peroxidase activities (22, 23).

## CAFFEINE IMPROVES ATHLETIC PERFORMANCE

Caffeine is a central nervous system and cardiac stimulant that has been widely demonstrated to enhance athletic performance. The central nervous system controls many cognitive functions and caffeine has been shown to improve concentration and alertness in military personnel (24). In a study of caffeine consumption involving 22 resistance-trained men ranging from 18 to 29 years old, muscle endurance improved in the bench press and leg press by 11 and 12 %, respectively (25). Another group of study participants using a graded treadmill after the ingestion of caffeine were found to have significantly increased VO<sub>2</sub>max readings (26). Athletes participating in events that depend upon aerobic endurance, muscular endurance, and sustained mental concentration may be able to enhance their performances by taking caffeine prior to their activities.

## DL-PHENYLALANINE ELEVATES MOOD AND ENHANCES CONCENTRATION

DL-Phenylalanine may help to elevate mood and enhance concentration. In one study, phenylalanine was taken every day for two weeks and a positive mood was obtained in 74% of the subjects (27).

If you're looking for a great pre-workout product to provide a smooth but powerful source of energy that also includes an extensive list of effective performance enhancers, then XPEDITE is for you! It's time to XPEDITE your fitness and performance goals!

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