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## INSIDE INFO 07

### MAXIMIZING THE STIMULUS FOR MUSCLE GROWTH THROUGH PROPER PRE & POST WORKOUT SUPPLEMENTATION

In the most simple of terms, muscle growth can be defined as the requisite adaptation of muscle to increasing workloads. For this to occur, two things are absolutely necessary: first - an overload or stress upon the muscle (in our case via weight training), and second - a cellular environment conducive to anabolism - without either, adaptation (growth) will simply not occur. Part I of this article discusses how properly-designed ergogenic sports supplementation can greatly enhance an individual's ability to maximize the former requirement by using a pre-workout supplement, while Part II deals with the latter - how and why post-workout supplementation is crucial for optimal cellular adaptation following intense exercise.

Let's first discuss the actual workout and how training results in muscle cellular damage and primes the local environment for muscular adaptation. Following mechanical stress, especially during the eccentric portion of the movement, micro-tears occur in the contractile proteins of the target muscle. The severity of these micro-tears is directly related to the relative load (weight) and duration (reps) employed. It is at this point where the observant gym-goer sees a potential application for a sports supplement in optimizing the induction of muscular stress (i.e. get a better workout).

Satur8 Rush® by ISS® is such a supplement. ISS® (Integrated Sports Science) is a nutritional and sports supplement company that (as the name suggests), takes great pride in providing to the public nutritional supplements that are based on scientific research rather than anecdotal evidence or fashionable industry trends. This pre-workout supplement takes a three-tier approach to optimizing muscular performance by including cell volumizers, focus and energy enhancers,



and crucial electrolytes in precise quantities. Cell volumizing agents allow for increased blood (and therefore nutrient) flow to the working muscle(s). As a result of enhanced flow, not only can energy substrates, electrolytes, and other beneficial factors reach the working muscle easier, but byproducts such as lactic acid which interfere with the ability of a muscle to function, are removed more effectively. Focus and energy enhancers are crucial for


generating an enhanced level of mental stimulation via your sympathetic nervous system and optimize neurological recruitment, allowing for increased performance. Electrolytes (sodium, potassium, and magnesium) are included to properly replenish those lost during strenuous activity, which if not replaced can result in muscle cramping and sub-optimal performance.

Cell volumizing agents included in Satur8 Rush® are dicreatine malate, glycoyamine, betaine anhydrous, glucuronolactone, L-taurine, and L-arginine AKG. Let's go through these ingredients individually and examine why they're beneficial for the goal of increasing muscular performance, which translates into a better workout, and over the long run, better gains.

Dicreatine malate is creatine molecule conjugated to malic acid. This fusion dramatically increases the solubility of creatine and therefore its bioavailability. Literally thousands of peer-reviewed articles have been published on the performance-enhancing properties of creatine. Glycoyamine is a glycine analog and therefore a precursor to creatine formation in the *(continues page 2)* ►

liver. For endogenous conversion to creatine however, a methyltransferase reaction is required (1). This is where betaine anhydrous is important, as it can donate methyl groups that may be used for creatine biosynthesis (2). As an additional bonus, betaine anhydrous may counteract the deleterious effects of elevated homocysteine levels in the liver (3). Next on the list are glucuronolactone and L-taurine, naturally-occurring compounds that have been recognized to positively affect mental performance and mood (4-7). In addition to its effects on cognitive function, L-taurine possesses insulin mimicking properties (8) and is beneficial for muscle cramping during times of liver stress (9). L-arginine is an amino acid naturally found in the body that is a precursor to nitric oxide (NO), a potent vasodilator, and creatine (10). The L-arginine AKG (alpha ketoglutarate) conjugate is thought to enhance its availability, and therefore effectiveness.

Next on the list of beneficial ingredients present in Satur8 Rush® are focus and energy stimulants. ISS has included L-tyrosine, vinpocetine, and caffeine. L-tyrosine is an amino acid that has been well established to maintain cognitive performance and mood under conditions of acute stress (11) and is the precursor to the neurotransmitter norepinephrine (NE) (12). Vinpocetine is a vasoactive agent that may have beneficial cognitive effects on performance. And of course, what pre-workout formula would be complete without caffeine - the single most studied ergogenic aid in history, shown many times over to increase exercise performance through both metabolic and cognitive pathways (13).

Together, the agents in Satur8 Rush® function synergistically to ensure that by priming both your physiological and neurological systems, you obtain the most effective workout possible. This will in turn set the stage for subsequent cellular adaptation and repair. 

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