White paper

A comprehensive review concluded that, despite the marketing claims, the advantage of the multiple creatine forms over creatine-monohydrate regarding their safety and efficacy profiles is not substantiated (2).

Guanidinoacetic acid (GAA) is a naturally occurring amino acid-like substance found in low concentrations in vertebrates. It serves as the biosynthetic precursor to creatine, a crucial molecule in energy metabolism. GAA is produced endogenously through the action of the enzyme L-arginine amidinotransferase, which transfers an amidino group from L-arginine to glycine, yielding GAA and L-ornithine. Subsequently, the enzyme guanidinoacetate methyltransferase transfers a methyl group from S-adenosylmethionine (S-Ado-Met) to GAA, forming creatine and S-adenosylhomocysteine (S-Ado-Homocysteine).

In humans, GAA is primarily synthesized in the kidney and pancreas, while its conversion to creatine predominantly occurs in the liver. Endogenously produced creatine is transported via the bloodstream to target organs, where it is taken up by a specific sodium- and chloride-dependent creatine transporter. Creatine and its phosphorylated form, phosphocreatine, are found in high concentrations in skeletal muscle, retina photoreceptor cells, brain, heart, and spermatozoa, where they serve as energy buffers during periods of high energy demand. Additionally, phosphocreatine functions as an energy carrier, shuttling high-energy phosphates from the mitochondria (the site of generation) to the cytosol (the site of ATP utilization), thereby regenerating ATP from ADP.

GAA is also present in plants, animals, and humans in small quantities. The GAA levels in some seeds and plants range from 1 to 13 nmol/g dry weight (0.1-1.5 mg/kg). In laboratory animals, the highest GAA concentrations were found in the kidney, ranging from 116 to 420 nmol/g kidney (14-49 mg/kg). GAA content in chicken breast averages 8.2 mg/kg. Commercially available animal products show GAA levels between 1 and 15 mg/kg in meat and fish, and below 0.1 mg/kg in milk products. Although GAA is part of the diet, daily intake from plant and

animal sources is minimal, and its main intake is proposed through its use as a new dietary ingredient.

CreGAAtine™ boosts muscle and brain bioenergetics with a superior creatine-increasing effect

Creatine-monohydrate administration over 4 weeks increases muscle creatine by about 2% while CreGAAtine™ leads to a 16.9% increase of creatine inside the skeletal muscle (7). A randomized double-blind superiority trial compared the effect of the administration of GAA-creatine preparation to creatine alone over 4 weeks. The results showed that the combination yields a significantly greater change from baseline in creatine level in vastus medialis muscle, a part of the quadriceps muscle group (7).

CreGAAtine™ increases creatine levels in the brain

CreGAAtine™ is an advanced preparation compared to other creatine formulas as it results in enhanced creatine levels in the brain. Specifically, the creatine-GAA combination leads to a 3.9 times higher creatine level in the grey matter and 1.9 times higher concentration in the white matter compared to creatine alone (7). The augmented creatine-increasing effect in brain tissue may be explained by the multiple modes of transport pathways of GAA and the synergistic effect between GAA and creatine. Even though creatine receptors are most probably saturated with creatine upon their coadministration, GAA can enter the cells via other protein carriers and passive diffusion and in that manner provide an additional creatine rise inside the cell (8). While GAA effectively targets the cerebellum, white matter, and gray matter, its effect on the thalamus is lacking (9,10) On the other hand, creatine itself reaches the thalamus but has a limited effect on white matter in contrast to GAA (11).

CreGAAtine™ has 4 ways to enter the cell

Creatine has only one known way of entering the cell, which over time becomes saturated with continuous creatine supplementation, resulting in a lower capacity to transport creatine into the cell (8).

CreGAAtine™ not only uses the regular creatine receptors, but also utilizes 3 additional pathways to enter the cell, including GABA and taurine receptors, and even passive diffusion which does not require any protein carrier (12,13). Once it enters the cell, GAA turns into

creatine in a GAMT-controlled catalytic reaction and increases intracellular creatine levels. Moreover, CreGAAtine ensures the desired boost as there are fewer non-responders than regular creatine (14). As creatine receptors in the brain and muscles are close to being saturated with endogenous creatine under physiological conditions (12,15), the advantage of GAA to utilize additional transport systems creates an effective strategy to overcome limited exogenous creatine utilization and meet advanced energetical needs in exhaustive workout.

CreGAAtine™ helps weak muscles get stronger

CreGAAtine targets the weaker muscle groups as well and increases their strength by 20% compared to creatine-monohydrate (7). A study on 48 athletes, both men and women, demonstrated that this novel dietary agent and creatine precursor significantly improves both upper and lower body muscle endurance (16). The combination of GAA and creatine is of particular interest due to the possible synergism between the two substances (8). GAA was shown to target the muscle groups with lower levels of strength, which are muscles of the upper body in the general population. The facilitation of the GAA absorption by the exercise-naive tissues may be explained by their tendency to better absorb GAA as the GAA levels are initially lower in these compartments (7).

CreGAAtine™ reduces creatine-driven side effects

Creatine tends to increase total body weight by water retention giving your muscles a balloon-like appearance. A study that examined two different creatine formulations demonstrated that the creatine-monohydrate intake results in the largest incline in total and intracellular body water when compared to placebo and creatine ethyl ester. Creatine ethyl ester led to the highest increase in extracellular water in comparison to the two other groups (17).

The optimized formulation in CreGAAtine was created to make you stronger and to help you build your lean muscles without excess body weight gain. In a randomized, double-blind trial, the GAA-creatine arm was shown to result in a lower weight gain and more favorable outcomes in upper body muscular strength (7).

No known safety concerns

In a long term (6 month) study CreGAAtine showed no side effects and lowered the total homocysteine levels.

Trust your product - it's important

Many creatine-based supplements on the market contain some contaminants, which surely implies their low quality (20). CreGAAtine has been certified by Informed Sport which guarantees that each batch we release to the market is free of banned substances.

Breaking Barriers: Women's Performance Enhanced with CreGAAtine Supplementation

Although creatine is a supplement primarily consumed by men, in a new study conducted with CreGAAtine, we obtained results from female participants that are very interesting. After just one dose taken before training, the GAA level increased by 62.4%, and creatine by 660.3% post-exercise. For instance, in women, there was a noteworthy 7-second increase in time to exhaustion, a substantial 2.7-unit increase in anaerobic threshold, and a meaningful 1.6 ml/kg/min increase in oxygen uptake. These findings suggest that a single-dose supplementation of CreGAAtine before exercise may effectively elevate creatine levels and modestly enhance exercise performance (21).

New studies in progress:

1. Effects on muscle protein synthesis
2. Effects on body composition and total body glycogen content
3. Effects on brain oxygenation and cognitive performance
4. Effects on e-gaming performance in professional athletes
5. Effects on health indices and metabolism during fasting
6. Effects of escalating doses on safety and performance

Studies currently being published:

1. Andjelic B, Todorovic N, Vranes M, Ostojic SM. Creatine-guanidinoacetic acid supplementation improves esports performance in young men. Heliyon. IF 3.4
2. Baltic S, Nedeljkovic D, Todorovic N, Ratgeber L, Betlehem J, Acs P, Stajer V, Ostojic SM. The impact of short-term supplementation with guanidinoacetic acid and creatine versus creatine alone on body composition indices in healthy men and women. Journal of Nutrition and Metabolism. IF 2.3
3. Escrivano-Ott I, Ochoa-Lacar J, Calleja-Gonzalez J, Ostojic SM, Mielgo-Ayuso J. Evaulating guanidinoacetic acid as a novel ergonutrition aid for basketball players. Journal of Science and Medicine in Sport. IF 3.0

4. Farkas G, Babszkly Z, Stajer V, Ostojic SM. Dose-escalation study with supplemental creatine-guanidinoacetate in healthy adults. Letters in Functional Foods. IF not applicable
5. Ranisavljev M, Todorovic N, Stajer V, Ostojic SM. Post-marketing surveillance study of creatine-guanidinoacetic acid safety in healthy adults. Frontiers in Nutrition. IF 4.0
6. Zanini D, Todorovic N, Ostojic SM. Creatine with guanidinoacetic acid improves prefrontal brain oxygenation before, during, and after cognitive task: a randomized controlled pilot trial. Nutrition and Health. IF 1.9

We are continuously dedicated to enhancing our formulation, and we are pleased to announce that our new product, CreGAAtine+b, features an innovative upgrade. This advanced formulation now includes a complex of B vitamins, meticulously chosen to further enhance the synthesis of creatine and its derivatives within the body. By incorporating essential nutrients, creatine+b ensures optimal bioenergetics for all tissues, exemplifying our commitment to scientific advancement and holistic wellness.

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