

MD+ Creatine Advantage

The Ultimate Creatine Product, With Several Synergistic Ingredients for Maximizing the Body's Energy Systems.



While creatine monohydrate has been shown to enhance athletic performance, and to increase strength and muscle mass,^{1,2,3,4,5,6,7} these effects are enhanced in Creatine Advantage by stacking creatine with other ingredients. Our formula not only contains the highest quality, pure crystalline creatine monohydrate so that it mixes instantly and leave's no chalky taste, but we've also added a host of other natural ingredients that make our formula much more effective and versatile than any other creatine products on the market.

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Creatine monohydrate is absorbed fairly well if just mixed with water. Using carbs increases insulin secretion and thus creatine utilization. However, basically taking in a few ounces or more of sugar to your creatine or even adding creatine to a protein shake will do just as much for creatine absorption and utilization as the creatine products that are out there now. However, with the right formulation you can accomplish a lot more.

To understand why you need a number of synergistic ingredients besides creatine to maximize the energy systems in the body it's important to know some basics on creatine metabolism. Creatine is used by the body to make phosphocreatine, and the phosphocreatine is a high energy source that functions to replenish ATP (the primary energy source in the body) when it's depleted.

The body needs about 2 grams of creatine a day to account for the amount of creatine that is metabolized to creatinine irreversibly. The creatinine is then excreted in the body. Part of this turnover can be replaced through exogenous sources of creatine in foods, especially meat and fish, and of course by supplementing with creatine monohydrate or creatine phosphate (the two most common forms available in supplements with the monohydrate being by far the most widely available). The remainder is derived via endogenous synthesis from the precursors arginine, glycine and methionine. Both the creatine and the creatine precursors (all three are in the glutamine peptides mix) are supplied in Creatine Advantage.

It's also important that you provide the body with the means, preferably by breaking down and oxidizing body fat, to increase energy levels so that phosphocreatine can be made from

creatine plus phosphate. And it's important to simultaneously maximize the effects of insulin, GH, and IGF-I, which is difficult to do using carbs and sugars, not only to synergistically maximize the levels of these anabolic hormones, but also so that the creatine is most efficiently used.

Creatine Advantage doesn't overwhelm the body with creatine, since less than 3 grams per day is all that's needed to maximize creatine cellular levels - the usual doses of creatine used by athletes are mostly excreted⁸ (as urinary creatine and a small amount of creatinine) and secondly the use of excessive amounts for long periods of time may be counter productive as far as potential adverse effects. However, at the same time Creatine Advantage maximizes phosphocreatine and ATP production (the TCA cycle intermediates and the AMP), and protein synthesis (the amino acid content and glutamine peptides).

Added amino acids and dipeptides and other essential boosters allow an increase in the absorption and utilization of creatine and increase the volumizing, anticatabolic and anabolic effect of the formula. The added energy ingredients and precursors make Creatine Advantage the ultimate creatine and energy mix, one that will maximize muscle mass and performance.

But that's not all. Creatine Advantage, with its synergistic formulation, also has neuroprotective effects,^{9,10,11} likely due to its effects on phosphocreatine and ATP,¹² as well as protective and reparative effects on other cells and systems in the body.

For example, a recent study found that topical creatine has beneficial effects on skin damage because of its ability to recharge the energy mechanisms in these cells that deal with the protection and repair of skin damaged by free radicals.¹³

Mitochondrial Effects

The effects of creatine are enhanced by stacking creatine with other ingredients. These added ingredients increase the use of creatine by the body, as well as increasing energy systems beyond just creatine phosphate, as well as providing extra cytoprotective and antioxidant protection.

For example, Creatine Advantage contains several ingredients, including creatine and alpha lipoic acid that have multiple functions, including ameliorating mitochondrial disorders.¹⁴

As well, ingredients such as taurine, alpha lipoic acid, and various amino acids, including histidine, have potent cytoprotective, neuroprotective, and antioxidant effects.

For example, taurine is considered a potent antioxidant and cytoprotective agent that may be useful for combating the adverse effects of physical and psychological stress, and aging.^{15,16,17,18} A recent study also in rats showed that taurine is useful for reducing physical fatigue and muscle damage during exercise training, presumably due to its antioxidant effects and the beneficial effects that taurine has on metabolism and on muscle and cardiac functions.¹⁹

Alpha lipoic acid (ALA or LA) is also a potent antioxidant²⁰ with other useful and diverse properties, including increasing insulin sensitivity.

In a recent review²¹ the author states “LA improves glycemic control, polyneuropathies associated with diabetes mellitus, and effectively mitigates toxicities associated with heavy metal poisoning. As an antioxidant, LA directly terminates free radicals, chelates transition metal ions (e.g. iron and copper), increases cytosolic glutathione and vitamin C levels and prevents toxicities associated with their loss.”

Other amino acids that are a part of the glutamine peptides in Creatine Advantage contribute to overall health and repair in many ways. For example, proline and glycine are essential for collagen production. As well, the sulphur containing amino acids (also in the glutamine peptides) have significant antioxidant and other effects.²²

Increased Synthesis of PC and ATP

Creatine Advantage contains all the necessary products for the synthesis of both high energy phosphate compounds creatine phosphate and ATP, and for the efficient salvage of ATP after it's been metabolically degraded, including:

- **Inorganic phosphorus and phosphates – also important for normalizing and regulating thyroid hormone.**
- **Creatine**
- **Inosine**
- **Ribose**

For example a recent study found that ribose supplementation acutely increased ATP resynthesis after high intensity exercise, and that that oral intake of ribose in humans after 1 wk of high-intensity training lead to higher resting ATP levels.²³

It also contains the following nutrients to facilitate the glycolytic and TCA cycle energy processes:

- **Biotin** - a cofactor in many energy reactions involving glycogenolytic, glycolytic, TCA and anapleurotic enzymes.
- **Magnesium** - which has also been shown to increase energy systems, insulin sensitivity, protein synthesis and serum testosterone, GH and IGF-I levels.
- **Calcium** - which has been shown to facilitate muscle contraction and decreasing fatigue).
- **Potassium**, the transport of which is linked to aerobic glycolysis.

Increasing TCA Flux and ATP Synthesis

Creatine Advantage maximizes ATP production (as I mentioned above ATP is the main energy source in the body - the function of phosphocreatine is to replenish ATP, so it makes sense to increase ATP levels as well). It contains a proprietary blend of several ingredients that maximizes mitochondrial anapleurotic flux in the TCA cycle resulting in increased ATP production and increased energy availability for protein synthesis and other functions, including the formation of phosphocreatine.

These ingredients, including several anapleurotic direct and indirect TCA cycle intermediates (such as **aspartate, citrate, malate, fumarate, succinate**, and the various anapleurotic and the various amino acids, including the **branched chain amino acids, glutamate, glutamine**, and other amino acids present in the **glutamine peptides** hydrolysate), impact on TCA flux and maximize mitochondrial metabolism, increase aerobic ATP production, and enhance insulin and growth hormone/IGF-I secretion and formation.

The overall increase in anapleurotic flux produces an increase in aerobic energy production, insulin secretion, and protein synthesis, and results in an increased adaptive response, a surge in skeletal muscle cell growth, increased fat loss, and improved recovery.

Adenosine monophosphate (AMP), one of the ingredients in Creatine Advantage, activates AMPK (AMP-activated protein kinase), which in turn, among other effects such as increasing insulin sensitivity in skeletal muscle,²⁴ decreases the concentration of malonyl-coA in peripheral tissues, (as does exercise BTW) and thus decreases triglyceride accumulation and increases fatty acid oxidation.²⁵

The overall response to all of this is also an increase in energy output, which under conditions of energy deprivation, such as when you're trying to lose weight and/or body fat, increases fat oxidation further.

Insulin Boosting System

Creatine Advantage has a low carbohydrate based insulin boosting system (glutamine in the form of glutamine peptides - more stable in liquid form and more effective than free glutamine) and compounds to increase insulin sensitivity (**chromium, histidine** – which also provides intracellular buffering to stimulate anaerobic energy formation, **taurine**²⁶ – which also has significant antioxidant and protective effects, stimulates growth hormone secretion and increases cell volume, and racemic **alpha lipoic acid** (a combination of the two main enantiomers of ALA – ALA is also an excellent antioxidant) and thus make the insulin more effective.

All of these compounds increase the boosting effect that insulin has on intramuscular creatine phosphate levels. For example a recent study found that co-ingestion of alpha-lipoic acid with creatine can enhance muscle total creatine content as compared to the ingestion of creatine and sucrose or creatine alone.²⁷

As well, there is a significant increase in insulin sensitivity and/or insulin secretion, when a protein hydrolysate, such as the **glutamine peptides**, is combined with creatine.²⁸ **Sodium** is also important for increasing creatine uptake in muscle and some studies has been found to be important for creatine uptake into relatively insulin insensitive muscles such as the soleus.²⁹

Creatine Advantage Also Contains:

1. **Glutamine peptides**, which have anabolic (increases protein synthesis and muscle mass) and anticatabolic (decrease muscle breakdown) effects, above those normally associated with glutamine, as the peptides themselves have some physiological effects. Also the peptide form is better absorbed than free glutamine that is not peptide bonded.

As well, the glutamine in the glutamine peptides:

- Regulates protein synthesis
- Increases both aerobic and anaerobic energy systems
- Has beneficial effects on the immune system
- Aids in the prevention and treatment of the overtraining syndrome.
- Increases insulin sensitivity when a protein hydrolysate is combined with creatine.³⁰

A recent study found that a combination of creatine monohydrate plus glutamine together resulted in significantly increase muscle mass and strength.³¹

2. An **advanced cell volumizing formula** that results not only in increases in protein synthesis and an anabolic effect, but an increased transport of creatine inside muscle and other cells. This formula includes:

- **Glutamine**
- **Taurine**
- **Potassium**
- **Sodium**
- **Creatine** itself which has significant volumizing effects.

3. **Branched Chain Amino Acids**

Increased intracellular concentrations of branched chain amino acids (leucine, valine and isoleucine) stimulate formation of acetyl-coenzyme (CoA) and succinyl-CoA, thus increasing both glycolytic and anapleurotic flux and aerobic and anaerobic energy production. All three, but especially leucine, have a synergistic effect with creatine on increasing protein synthesis.

What's Not in Creatine Advantage

Almost as important as what's in Creatine Advantage, is what's not in it. For example, guanidinopropionic acid (GPA), an ingredient that is used in some creatine products, is not a useful ingredient as it seems that its use can decrease creatine levels in heart muscle cells and likely muscle cells.³² As well, in keeping with a lower carb approach, which besides decreasing fat oxidation also decreases GH and IGF-I levels, Creatine Advantage only contains 1.5 grams of carbs per 10 grams serving - just enough to maximize creatine uptake into muscle cells, but not enough to have counter productive effects.

Safety of Long-Term Creatine Intake

Studies have shown that the long term use of creatine does not have any significant side effects, such as an increase in muscle cramping or injuries, nor does it impact on the body's ability to manufacture creatine endogenously once the creatine is discontinued.³³³⁴ Muscle creatine levels usually return to normal within 4 weeks.³⁵

Directions: Add one scoop (10 grams – containing 3 grams of creatine) to 8-12 fl oz of water and stir. Take one serving two to four times a day for 10 days and then once or twice a day for maintenance.

Supplement Facts:			
		Serving Size: 1 rounded scoop of dry powder (10g)	
		Servings Per Container: 42	
	Amount Per Serving	% Daily Value	
Calories	35		Potassium (as Dipotassium Phosphate) 95mg 3%
Total Carbohydrate	1.5g	1%**	Creatine Monohydrate 3000mg *
Vitamin B6 (as Pyridoxine Hydrochloride)	5mg	250%	Taurine 1000mg *
Biotin	60mcg	20%	D-Ribose 800mg *
Calcium (as Dicalcium Phosphate)	60mg	6%	L-Inosine 500mg *
Phosphorus (as Dicalcium Phosphate & Dipotassium Phosphate)	100mg	10%	Alpha Lipoic Acid 150mg *
Magnesium (as Dimagnesium Phosphate)	75mg	4%	Creatine Advantage Proprietary Blend 3200 mg
Chromium (as Chromium Nicotinate)	25mcg	21%	Branched Chain Amino Acids, Glutamine Peptides, Glutamate, Histidine, Aspartate, Malate, Citrate, Succinate, Fumarate, AMP - Adenosine Monophosphate
Sodium	10mg	1%	
Other Ingredients: Beet powder for color, natural flavors and sucralose.			
*Daily Value not established			
** Percent Daily Values are based on a 2000 calorie diet			

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