



Creatine Monohydrate

A cell-volumizer that improves blood lipid levels and promotes muscle growth!

SKU: 4003

DESCRIPTION

Creatine (CR) is a naturally occurring substance, produced in our bodies in the liver from the amino acids **L-Arginine**, **L-Glycine** and **L-Methionine**(1). Daily turnover of creatine occurs at a rate of ~2g/day via non-enzymatic, irreversible degradation of creatine and creatine phosphate to creatinine(2). Creatinine freely diffuses out of the cell and is easily filtered by the healthy kidney(3). This loss is normally replaced by endogenous CR synthesis, as well as exogenous (dietary) sources of creatine such as meat(4). However, vegetarians typically have lower levels of creatine in serum and muscle(5), and experience a greater elevation in muscle CR following dietary supplementation(6).

Due in part to its relatively large mass, over 95% of the body's store of creatine is found in skeletal muscle (~120g in a 70kg male(1)), where it participates in energetic processes to restore ATP and shuttle high energy phosphate in the form of CR phosphate from the mitochondria to the myofibrillar cross-bridges to generate muscular contractile force(7).

Because CR is a charged molecule(2) it must normally be transported across cell membranes by a CR transport protein, including that of the gut (for oral absorption) and skeletal muscle (for uptake into the cell)(8-11). Following a period of CR loading, all of a 5g daily dose of CR monohydrate is recoverable in the urine as CR or its degradative by-product creatinine(12), suggesting that in most individuals, absorption of creatine monohydrate is complete, at least at these doses.

However, anecdotal reports of gastric distress(13) suggest that some individuals may have difficulty absorbing CR in the amounts provided by a CR supplement. To aid in trans-membrane movement, ethyl esterification (akin to the acetylation of salicylic acid to make aspirin, a.k.a. acetylsalicylic acid) of drugs or other substances is commonly employed to bypass normal means of uptake, enhance bioavailability and reduce side effects(14). Although scientific investigation of the pharmacokinetics CR ethyl ester (CEE) is lacking, anecdotal reports of increased body mass without gastric discomfort are consistent with the abrupt weight gain noted in numerous research studies of CR monohydrate supplementation(15-22), suggesting the CEE does indeed make its way to skeletal muscle.

The ergogenic and anabolic effects of CR have been under investigation for more than a decade, with widely inconsistent results(23). However, taken as a whole the large body of literature suggests that supplemental CR can have ergogenic effects, especially during brief duration, high intensity exercise (such as resistance exercise) and in individuals who have low muscle CR levels, such as vegetarians, and those with abnormalities of CR metabolism(21, 24, 25). Creatine may also have an anti-inflammatory action(26, 27), aid in nerve re-generation(28) have an anabolic or anti-catabolic effect on skeletal muscle(29-32), although the literature is not consistent in this regard(33, 34), and/or prevent performance decrements during periods of high intensity training(35).

By aiding in muscular performance (training stimulus), affecting recovery via altering muscle protein metabolism or nerve function, CR would hypothetically enhance adaptation to exercise training, including the muscular growth adaptation to resistance training. The degree to which this occurs is likely dependent upon the degree to which supplemental CR increases muscle CR as well as body mass during the initial period of CR supplementation(36, 37).

Supplement Use

Individuals should consult with their physician before beginning CEE supplementation, especially those with pre-existing renal disease.

Adverse medical side effects of short and long-term CR supplementation are generally absent in the scientific literature(13, 23, 38-42), although individual cases of those experiencing reversible renal dysfunction in association with CR supplementation have been reported(43).

CR can be taken in doses of 2-5g / day to elevate or maintain elevated muscle creatine levels(12, 44, 45). Consuming CR as CEE may even lower the amount of CR needed for this effect.

CR supplementation improves blood lipid profile by elevating HDL concentration and reducing total cholesterol, LDL, and blood triglyceride levels(46, 47). CEE could be taken with with Alpha Lipoic Acid to enhance its uptake(48), as well as with carbohydrate to enhance glycogen synthesis(49). Taking CEE, along with Vitamin C, may reduce muscle soreness or inflammation(26, 27). CEE could also be used in a post-workout, weight gainer or carb-up drink along Alpha Lipoic Acid, **arginine** (to optimize nutrient delivery), **waxy maize** and/or other carbohydrate source, and a high quality protein or protein blend.

Ingredients

Creatine Monohydrate.

Packaging

Packaged in heat-sealed foil pouches.

General Warnings

If you are currently pregnant or nursing, consult a physician prior to use. Keep out of the reach of children.

Allergen Warnings

This product is free from all forms of shell fish, tree nuts, yeast, gluten, salt, preservatives, lactose, and soy. This product is manufactured in a facility that handles soy, gluten, and milk products. Products ordered using Premium Flavor Systems will contain artificial flavoring and sweeteners. This product is manufactured in a facility that handles milk, soy, egg, peanut, nut, tree, fish, crustaceans/shellfish, and wheat products.

Volumetric Measures

Use the table below to approximate the gram equivalent weight for a given level measuring spoon (US Standard). Please note that accurate dosing should only be done with a recommended calibrated [scale](#).

Measuring Spoon (level)	g	mg
90cc Scoop	47.3	47331
70cc Scoop	36.8	36813
29.6cc Scoop	15.6	15567
25cc Scoop	13.1	13147
Tablespoon	7.8	7778
10cc Scoop	5.3	5259
¼ Tablespoon	3.9	3889
Teaspoon	2.6	2593
½ Teaspoon	1.3	1296
1.7cc Scoop	0.9	894
¼ Teaspoon	0.6	648
1/8 Teaspoon	0.3	324
1/16 Teaspoon	0.2	162
1/32 Teaspoon	0.1	81

DISCLAIMER: The above description is provided for information only and does not constitute medical advice. Please consult your physician or the appropriately licensed professional before engaging in a program of exercise or nutritional supplementation. No information in this site has been reviewed by the FDA. No product is intended to treat, diagnose, or cure any disease.

References

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4. Harris, R.C., et al., The concentration of creatine in meat, offal and commercial dog food. *Research in Veterinary Science*, 1997. 62(1): p. 58-62.
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7. Beesman, S.P. and F. Savabi, The role of the phosphocreatine energy shuttle in exercise and muscle hypertrophy, in *Proceedings of the 7th International Biochemistry of Exercise Conference* held on June 1-4, 1988 in London, Ontario, Canada, A.W. Taylor, Editor. 1990, Human Kinetics Publishers: Champaign, IL, p. 167-178.

Supplement Facts

Serving Size 1 (5g)

Servings Per Container 20

Amount Per Serving	% Daily Value*
Creatine Monohydrate 5g	**

** Percent Daily Values not established.

The above statement has not been evaluated by the FDA. This product is not intended to diagnose or treat any disease.

True Nutrition was established on the values of our customers not the owner's wallets. True Nutrition absolutely refuses to cut any corners when it comes to product quality, product validity and product manufacturing.

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