



Creatine and Whey Protein Supplements

Creatine Supplements

What is creatine?

Creatine is a nitrogenous organic acid that occurs naturally in animals and helps to supply energy to muscle and nerve cells. Our body's pool of creatine can be replenished through food or supplements or by synthesis from precursor amino acids. Most of muscle creatine is stored in the form of phosphocreatine. The breakdown of phosphocreatine results in ATP which is the major energy compound in our bodies. Creatine supplements enhance accumulation of creatine and phosphocreatine in muscles.¹

What are the types of creatine supplements?

The most common creatine supplements are creatine monohydrate, creatine citrate, creatine phosphate, creatine malate, and creatine ester. They are sold in capsule, chewable, and powdered forms. Creatine monohydrate is more commonly used because it is also the most intensely studied among all the different types.

Creatine supplements and athletic performance

Endurance (aerobic) exercises such as running, stationary cycling, and swimming show no improvement with creatine supplementation. However, there have been numerous studies that support short-term use of creatine monohydrate in activities that require short periods of high-intensity power and strength. These include weightlifting, sprinting, and rowing. Some studies demonstrated improved capacity for high intensity workouts,² higher maximal strength of muscle groups,³ and higher muscle mass in subjects who took the supplement.⁴ The most significant improvements are seen in those individuals with the lowest initial total creatine and vegetarians.⁵

How much creatine do I need?

Creatine is considered safe when taken in recommended doses. Athletes often take creatine in phases. During the loading phase, athletes consume 20-25 grams per day (in 5 gram increments) per day for 5-7 days. During the maintenance phase, 3-5 grams per day are consumed.¹ Increase in muscle creatine occurs gradually over several weeks and the variability in accumulation between individuals is large. Creatine can also be obtained through food sources such as meats and fish in amounts less than 2 grams.

When should I take creatine?

Doses of 5 grams of creatine four times per day during the loading phase (5 days) and 2-5 grams during the maintenance phase are considered safe.⁶ Eating carbohydrate along with protein following intense exercise may also accelerate glycogen re-synthesis as well as promote protein synthesis.⁷ Therefore, taking creatine after exercise with a carbohydrate and/or protein supplement may be an effective way to increase and/or maintain muscle creatine stores.

What are the adverse effects of creatine supplementation?

Short term (less than 2 weeks) exercise studies have not reported any adverse effects of creatine supplementation. There have not been any long term studies done to evaluate the safety of prolonged use of creatine. However, creatine supplementation can often cause unwanted weight gain (1 – 3 lbs after 1 week)¹ due to increased water retention and not increased muscle. This may lead to muscle cramps, dehydration, and heat intolerance. Other undesired effects are nausea, vomiting, and diarrhea.

Should I take creatine supplements?

Creatine supplementation has been shown to improve athletic performance and muscle mass in short high-intensity work-outs and have no effect in endurance activities. Creatine supplements like other supplements do not undergo FDA evaluation and their composition is not regulated like over-the-counter or prescription drugs. Until further research establishes the long term safety, creatine supplementation is not recommended in athletes.

Whey Protein Supplements

What are whey proteins?

Whey is one of the two major proteins found in cow's milk, making up 20% of total milk protein.⁸ Whey proteins refer to a collection of individual proteins that can be isolated from whey.

They have the highest Biological Value (BV) of any protein, which means that the human body absorbs and utilizes whey proteins better than any other proteins.

What are the types of whey protein?

Concentrate: contain a low level of fat and cholesterol but generally have higher levels of bioactive compounds, and carbohydrates in the form of lactose (29%-89% protein by weight).

Isolate: processed to remove the fat and lactose, but are usually lower in bioactive compounds (90% protein by weight).

Hydrolysates: predigested and partially hydrolyzed whey proteins which consequently are more easily absorbed, but their cost is generally higher.

It is recommended to read the product label and purchase supplements that contain WPI (Whey Protein Isolate) or WPC 80 (Whey Protein Concentrate 80%). This ensures that the protein is in a more highly concentrated form. Whey Protein Isolate is a better option for those who are concerned about lactose.

What are the proposed benefits of whey protein?

Physical Performance

- High levels of essential and branch-chain amino acids which help maintain or build muscle tissue.⁸
- Supplementing with whey in athlete diets has been shown to improve body composition and increase strength compared to carbohydrate.⁹
- Immune Function
- Increases the levels of glutathione in the body, an anti-oxidant required for a healthy immune system.¹⁰
- Weight Management
- High quality whey protein is rich in leucine to help preserve lean muscle tissue while promoting fat loss. Whey protein contains more leucine than milk protein, egg protein and soy protein.¹¹

Other proposed benefits such as reduced risk for cardiovascular disease & cancer, diabetes management, and wound healing need further research.

How much whey protein do I need to consume?

Generally about 20-25 grams per day of whey protein is adequate for benefits associated with body composition, immune defense, and weight management. Athletes in training/ competition may need 40-50 grams per day.⁸ It is important to remember to include whole food sources of protein such as milk and dairy foods, meat and legumes in your diet. Whole foods provide additional nutrients beyond protein.

What are my total protein needs for the day?

The current Recommended Dietary Allowance (RDA) for protein is 0.8 grams per kilogram body weight. Athletes may need to increase their intake of proteins depending on their level of physical activity. Consult a dietitian to determine your personal nutritional needs.

How are whey proteins used in diet?

Whey protein products come in the form of powders, nutritional bars, or beverages. Whey protein powder can be easily added to smoothies, yogurt, juice, mashed potatoes, instant oatmeal, or with breakfast cereal or other foods.

What are the adverse effects of whey supplementation?

Taking whey supplements at recommended doses is generally considered safe. Talk to your doctor before using whey supplements if you are taking any over the counter or prescription drugs, or are pregnant or breast feeding. Symptoms such as breathing troubles, chest pains, skin hives, or rash may be signs of allergy.¹²

Should I take whey protein supplements?

There is scientific evidence that suggests benefits associated with whey protein supplementation in athlete diets. Short-term studies conducted using whey have not shown any serious side effects. However, the effects of long-term supplementation using whey are still unknown. The claims made on product labels and purity of whey protein supplements are not regulated by the FDA as is the case with all dietary supplements. Your protein needs can be met through diet alone or a combination of diet and supplements. Consult a dietitian to determine your personal dietary recommendations before taking any dietary supplement.

Creatine References

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If you are a registered University of Illinois student and you have questions or concerns, or need to make an appointment, please call: **Dial-A-Nurse at 333-2700**

If you are concerned about any difference in your treatment plan and the information in this handout, you are advised to contact your health care provider.

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