



THE SCIENCE BEHIND CREA-TECH™

Creatine Plus Electrolytes

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Introduction

Creatine is undoubtedly the most widely accepted ergogenic aid in the entire sports supplement industry, valued for its ability to boost athletic performance and promote muscle growth. Among the various forms of creatine available, creatine monohydrate remains 'King', being the most researched and proven to be effective. Extensive studies have demonstrated its capacity to increase muscle creatine levels, leading to improved performance, especially in high-intensity activities, like weightlifting and sprinting. Its combination of effectiveness and affordability has made it a top choice among athletes and regular gym users. The safety of creatine monohydrate is well-established, with numerous studies confirming minimal adverse effects. This robust body of research has made creatine monohydrate a cornerstone supplement for individuals seeking to enhance strength, endurance, and overall exercise performance. Crea-Tech™, is a science-backed creatine monohydrate product, formulated with added electrolytes and a bioavailability enhancer, to ensure you are getting the benefits you expect from your supplement.

Why Supplement with Creatine?

Supplementing with creatine is often necessary because the average diet, even one rich in meat and fish, typically doesn't provide sufficient amounts to fully saturate muscle creatine stores. Additionally, those following vegetarian or vegan diets may have significantly lower creatine levels, as plant-based foods do not contain any creatine⁽¹⁾. To achieve optimal levels of creatine for performance benefits, individuals would need to consume large quantities of creatine-containing foods, which is often impractical. Supplementation offers a convenient and effective way to boost muscle creatine levels, enhancing strength, power, and recovery in a more accessible manner. As mentioned, we typically get creatine from our diets (1-2 grams/day), and our liver makes creatine on its own. This however, only accounts for approximately 60-80% saturation of our muscles. We lose around 1-2% of our creatine as creatinine in our urine daily, from natural metabolism⁽²⁾. Therefore, approximately 2 grams of creatine is required to replace the normal losses of creatine for maintenance. Remember, this is just to replace the saturation levels at 60-80%, therefore one needs to take in at least 3 grams per day for additional benefits. Therefore, added supplementation, using a product like Crea-Tech™ is a great way to max out your cellular capacity of creatine.

How Creatine Works – Mechanism of Action

Once creatine is ingested, it is transported into the muscles, where it is converted into its active form, phosphocreatine (PCr)⁽³⁾. The phosphate group in PCr plays a crucial role in generating extra energy and delaying fatigue. Cellular energy is stored in the form of adenosine triphosphate (ATP). When ATP

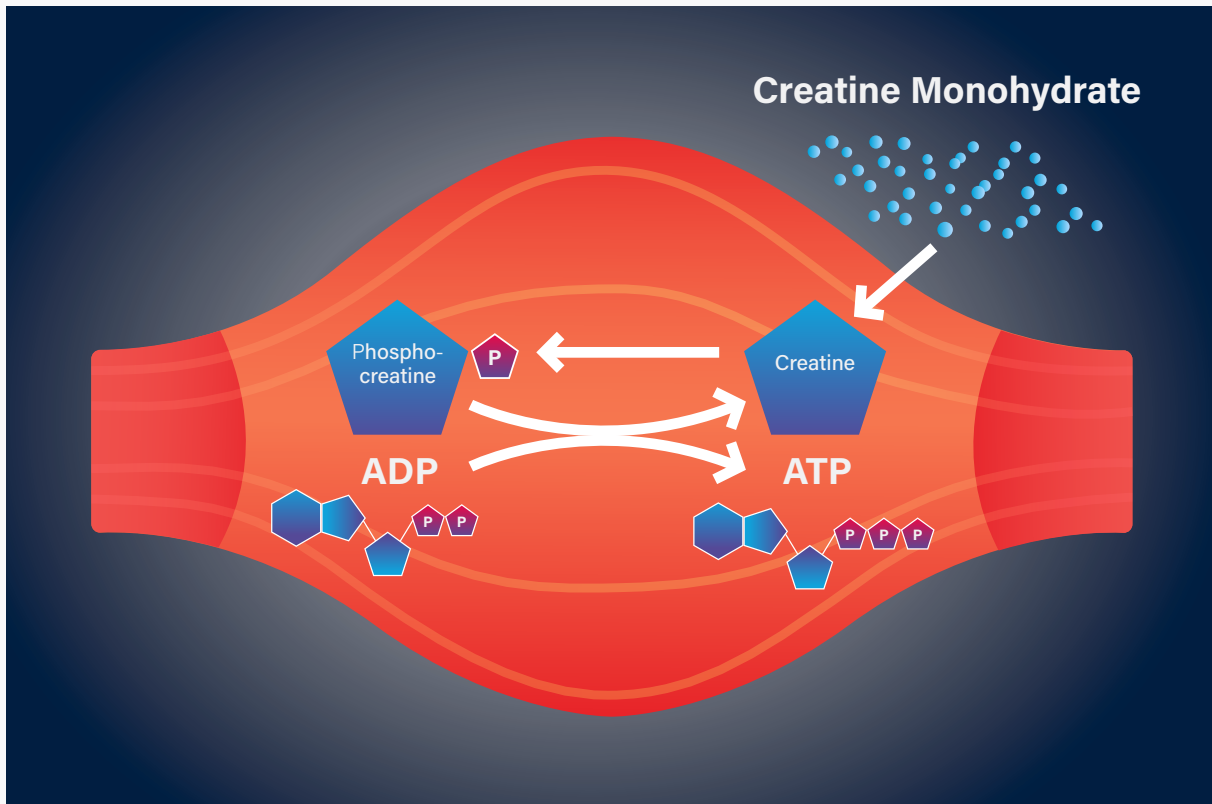


Figure 1. Creatine mechanism of action

is used for energy, it loses a phosphate group and turns into adenosine diphosphate (ADP). Fatigue is the outcome of not having enough ATP to perform a given exercise. Without PCr, the production of a steady flow of ATP is a slow process limited by how fast oxygen can get into the cell and burn the stored fuels. As exercise demands surpasses the ATP production, lactic acid builds up in the muscle resulting in that signature burning sensation that inevitably stops the exercise. This leads to performance decline, muscle fatigue, and, during weightlifting, the inability to complete additional reps. This is where PCr becomes essential. PCr rapidly donates its phosphate group to ADP, regenerating ATP without causing acid buildup or requiring oxygen. The muscles do not have a large store of ATP to start with; only a mere two-seconds worth of maximum effort. Afterwards, the PCr system kicks in from 2 seconds until about 10 seconds of maximum effort. Fortunately, research shows that muscles can store up to 20% more creatine than they naturally hold⁽⁴⁾. By supplementing with creatine monohydrate, muscle creatine levels increase, ensuring more PCr is available. This extends the capacity for high-intensity exercise, boosts strength, and may promote muscle hypertrophy through improved workload capacity during resistance training^(2,5). Additionally, creatine monohydrate can enhance muscle cell hydration and protein synthesis, further supporting athletic performance and muscle adaptations to training^(3,6).

Dosing of Creatine

A common misconception regarding creatine supplementation is that individuals must 'load' with creatine to increase intramuscular creatine stores and subsequently experience the purported ergogenic benefits of creatine supplementation. Without a loading phase it just takes slightly longer to saturate your muscles. It would take approximately 28 days to fully saturate the muscle cells, so loading only helps to speed saturation⁽⁴⁾. Regular supplementation with creatine causes creatine levels in tissues to reach this threshold, that once reached cannot be exceeded. A study by Hultman et al. compared the classic 'loading' (20 g/day for 6 days) versus normal daily 'maintenance' (3 g/day for 28 days). Results showed that the muscle creatine accumulation was similar (~ 20% increase). Additional research has confirmed

YOU SHOULD KNOW

Electrolytes play a crucial role in hydration because they are minerals that carry an electrical charge and are essential for various bodily functions, particularly in maintaining fluid balance within the body. Minerals, including sodium, potassium, and calcium play essential roles in ensuring that cells maintain the right amount of water, all which are present within Crea-Tech™.

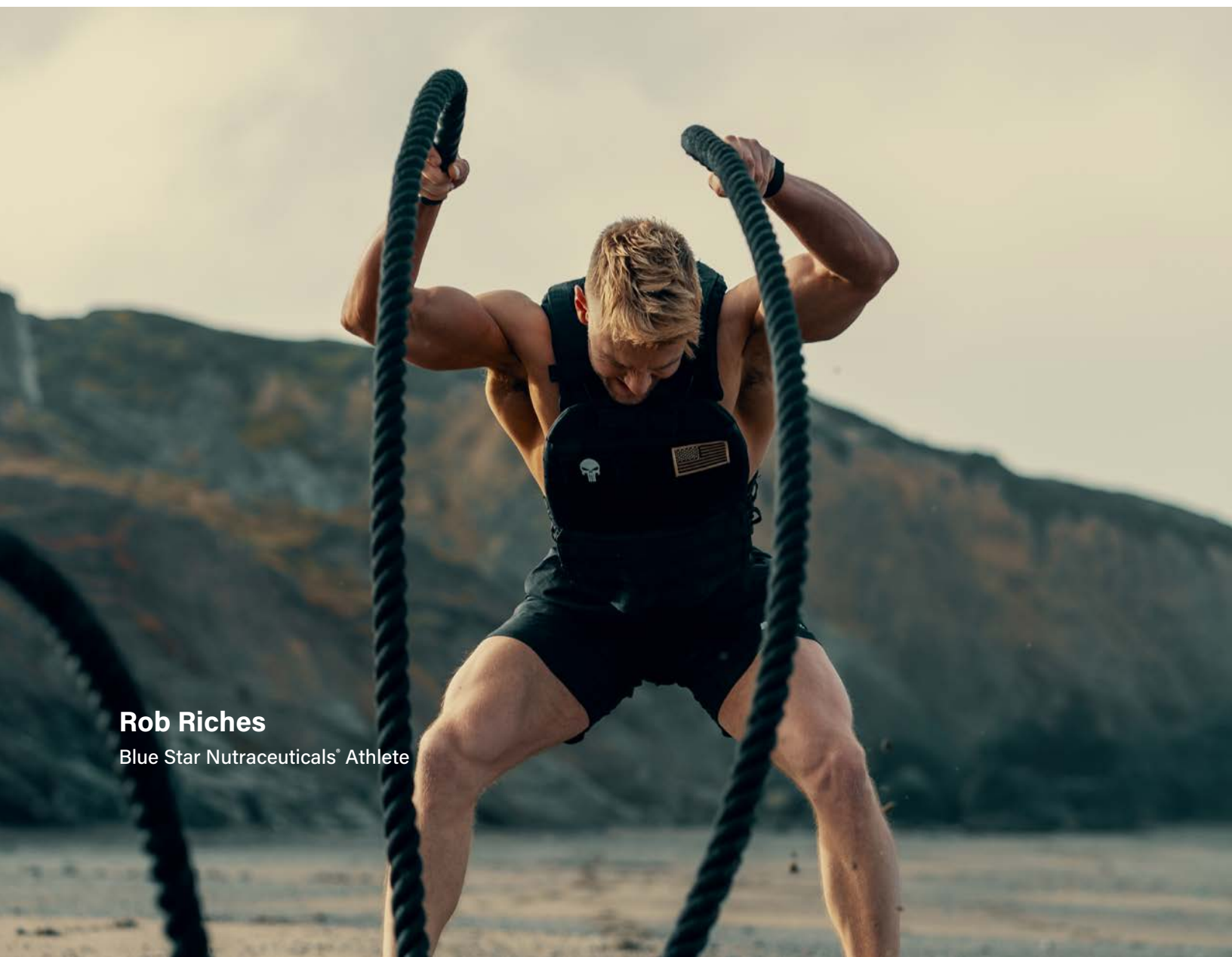
this, and individuals who consumed ~3-5 grams/day of creatine for a minimum of 4 weeks, experienced similar skeletal muscle saturation levels as with loading⁽²⁾. Once the muscles have reached saturation, either with or without loading, muscle saturation can be maintained with a daily 'maintenance' dose of 3-5 grams. This maintenance dose is well established throughout the literature for increasing and maintaining intramuscular creatine stores, leading to greater improvements in muscle mass, performance and recovery^(2,7).

NOT ALL CREATINE IS CREATED EQUALLY: INDUSTRY LEADING PURITY

Crea-Tech™ is formulated with Creapure®, a patented, premium, high-purity form of creatine monohydrate, produced in Germany. Creapure stands out due to its superior purity and consistency. Creapure® has been widely studied and proven to be safe and effective. Known for its exceptional quality, Creapure® undergoes a strict manufacturing process to ensure it is free from impurities and contaminants, offering over 99.99% pure creatine. Therefore, Crea-Tech™, using Creapure® makes it a more reliable option for athletes and fitness enthusiasts who prioritize the highest quality supplementation. The increased purity of Creapure™ may also reduce the likelihood of digestive discomfort or other side effects that some individuals experience with lower-quality creatine monohydrate products.

The Importance of Hydration

Beyond the cellular energy benefits of creatine supplementation, what very few individuals realize is that when they start taking creatine, it has an influence on water movement. Essentially, your body's water (predominantly from plasma volume) follows the supplemented creatine into the muscles, causing the muscle cells to swell. This is a normal physiological process, however, with the movement of this water into the muscle it may leave the rest of the body dehydrated. Hydration is crucial for exercise because it supports numerous physiological functions essential for optimal performance and safety⁽⁸⁾. Adequate hydration helps regulate body temperature, it supports the transport of nutrients and oxygen to muscle, as well as maintaining joint lubrication, reducing the risk of injury and discomfort during exercise^(8,9). Balancing fluid intake with electrolyte replenishment is key to staying hydrated and performing at your best, particularly during prolonged or intense physical activity. This is where electrolytes become so important and why Crea-Tech™ was formulated with 3 very important ones.



Rob Riches

Blue Star Nutraceuticals® Athlete

Electrolytes and Creatine

Electrolytes play a crucial role in hydration because they are minerals that carry an electrical charge and are essential for various bodily functions, particularly in maintaining fluid balance within the body. Minerals, including sodium, potassium, and calcium play essential roles in ensuring that cells maintain the right amount of water, all which are present within Crea-Tech®. Sodium is an essential nutrient and is needed by the body in relatively small amounts (provided that substantial sweating does not occur) to maintain a balance of body fluids and keep muscles and nerves running smoothly^(10,11). Potassium is also crucial for maintaining proper cellular function and muscle contraction, which are essential during physical activity. Calcium contributes to nerve function and overall electrolyte balance, ensuring that signals between muscles and nerves are transmitted effectively. These electrolytes maintain fluid balance, regulate nerve function, support muscle contractions, and optimize energy metabolism^(12,13). Electrolytes are also important to ensure benefits from creatine supplementation. Studies have shown the creatine update is directly impacted by the presence of electrolytes such as sodium, chloride and calcium⁽¹⁴⁻¹⁷⁾. Findings in a study by Stout et al, suggest that the ergogenic effect of creatine supplementation is enhanced when the creatine substance is taken in combination with electrolytes⁽¹⁸⁾. Supplementing creatine with these electrolytes helps with increasing uptake and storage of muscle creatine, thus potentially increasing performance^(19,20). Including sodium, potassium, and calcium in Crea-Tech™ promotes hydration and maintains water balance, helping the body function optimally.

ABSORPTION OPTIMIZERS

Piperine is commonly used as a bioavailability enhancer, meaning it helps increase the absorption and effectiveness of other compounds in the body⁽²¹⁾. Crea-Tech™ is formulated with Bioperine®, a patented extract of black pepper (*Piper nigrum*) that contains piperine, the active compound responsible for its distinct flavor and potential health benefits⁽²²⁾. Bioperine® may enhance creatine absorption by:

Improving bioavailability: Piperine has been shown to inhibit certain enzymes in the digestive system that would typically break down creatine, allowing more of it to be absorbed into the bloodstream.

Boosting nutrient absorption: Piperine can increase the absorption of various nutrients by enhancing the permeability of the intestinal lining, which may lead to more effective uptake of creatine.

As a result, when combined with creatine, Bioperine® may help users experience better results with smaller doses, potentially improving the performance-enhancing benefits of creatine supplementation. Bioperine® acts as an absorption aid, ensuring that the body makes better use of the creatine consumed.

Capsules vs Powder

Crea-Tech™ is a capsule product which some may consider less effective compared to powdered creatine products. When looking at the existing data whether creatine capsules are better than that creatine powder, it turns out that there is no difference and it really depends on individual preferences, lifestyle and specific needs. Both forms deliver the same active or medicinal ingredient – creatine monohydrate – and are effective in boosting strength, power and muscle mass. However, there are some key differences which people consider when deciding on their preference. These include:

Convenience

Creatine capsules are more convenient for people who are always on the go, as they are pre-measured and easy to carry. There's no need to mix anything, just take the capsules with water.

Creatine powder requires mixing with water or another liquid, which can be less convenient for those in a hurry. However, powder is often preferred by athletes who take larger doses or want the option to customize their intake

Dosage Control

Capsules often come in fixed doses, typically around 3–5 grams per serving. This can be beneficial for those who prefer precise control over their dosage.

Powder allows for more flexible dosing, and people can adjust their intake easily if they want to take more or less than the typical dose. Some find it easier to consume larger doses with powder.

Digestibility

Some individuals may find capsules more convenient and easier on the stomach.

So, which one is better, if you prioritize convenience and portability, then Crea-Tech® is your best choice, however as mentioned, both forms are effective, so the decision ultimately comes down to personal preference.

Summary

Crea-Tech™ represents one the latest and greatest innovations in the creatine category. Its carefully crafted formula combines Creapure®, the purest form of creatine with important electrolytes such as sodium, potassium, aimed at promoting hydration. By combining the highest-quality creatine with essential electrolytes, Crea-Tech™ helps enhance muscle strength, endurance, and hydration, ensuring that athletes can perform at their best. Its advanced blend not only fuels intense workouts but also promotes hydration levels, preventing muscle cramps and fatigue. Whether you're looking to boost power during training or support overall recovery, Crea-Tech™ offers a comprehensive solution that meets the needs of active individuals, making it a top choice for those serious about their fitness goals.



Rob Riches

Blue Star Nutraceuticals' Athlete

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