

Legal Ways to Improve and Enhance Athletic Performance

Creatine Monohydrate

Consuming creatine, either in foods or supplements, can increase muscle creatine stores. Research has also shown that with the right training, creatine loading can enhance an athlete's ability to perform tasks that require short bursts of power (less than 30 seconds in duration). **ATP (adenosine triphosphate)** energy is the main fuel source for high-intensity exercise. Once the stored ATP is just about used up (in about 6 seconds), the body resorts to another high-energy molecule known as *creatine phosphate* to convert ADP (adenosine diphosphate) to ATP. After about 10 seconds, the stored creatine phosphate in the muscle cells are also depleted as well. Creatine can increase phosphocreatine levels and therefore increase ATP energy production.

How Often Do Athletes Take Creatine?

Some studies have indicated that creatine stores can be increased without a loading dose, albeit over longer periods of time. A commonly accepted loading dose regimen is 20 to 25 grams per day, divided 4 times daily for 5 to 7 days,10 with variability between recommended loading doses

Is There a Downside to Creatine?

Creatine is possibly safe when taken long-term. Doses up to 10 grams daily for up to 5 years have been safely used. Side effects might include dehydration, upset stomach, and muscle cramps.

Is Creatine Prohibited?

No, creatine is not prohibited. Although creatine can have a small effect on performance, the effects are not guaranteed and the specific training program remains most influential.

How Long it Takes Creatine to Work

Taking a modest dose of around 3-5 grams daily can produce increased strength and endurance in around 2-4 weeks. While creatine loading, taking 20-25 grams daily for 7 days followed by a lower maintenance dose, can produce results in 5-7 days.

More Info Here:

<https://www.usada.org/spirit-of-sport/education/athletes-need-know-creatine/>

<https://www.healthline.com/nutrition/creatine-exercise-performance>

<https://eleanutrition.com/blog/creatine>



Nitric Oxide (NO)

From an athletic perspective, nitric oxide's primary role is to regulate the delivery of oxygen to muscles, It does this by relaxing and opening blood vessels, subsequently improving blood flow. Better blood flow not only translates into lower blood pressure, but a decreased demand on your heart and skeletal muscles.

Nitric Oxide (NO) has gained popularity in recent years as a way to potentially improve the ability to perform and recover faster by speeding blood flow to the muscles. However, this is one supplement you should definitely think twice about. There simply isn't enough research or product testing available to suggest that these supplements will be beneficial and safe.

If you're interested in the boosts that potentially come from a nitric oxide supplement, try adding nitrate-rich whole foods to your diet. That means stocking up on beets, arugula, and carrots in the produce section rather than scanning the supplement aisle of your grocery store. If you plan to add nitric oxide supplements to your routine despite the risks, remember that any supplement should be third-party tested to reduce the risk of a positive anti-doping test and/or negative health effects.

Does Nitric Oxide Help Athletic Performance?

In the past 20 years, nitric oxide has become a milestone in terms of both athlete physiology and pharmacology studies. The most known and remarkable function of NO is its role in controlling vasodilatation, blood rate, and mitochondrial respiration and thus enhanced performance.

How Long Should I Take Nitric Oxide Before a Workout?

With nitric oxide boosters such as Arginine and Citrulline you can either supplement with a single gram dosing three times a day or three grams once a day, gaining the most benefit if it's taken 30 minutes to an hour before a workout session.

What Supplement Is Best for Nitric Oxide?

Look for supplements that contain ingredients such as L-arginine, L-citrulline, and beetroot extract. These ingredients are known to increase nitric oxide production in the body and improve blood flow.

More Info at:

<https://www.usada.org/spirit-of-sport/nitric-oxide-supplements/>

<https://www.healthline.com/nutrition/nitric-oxide-supplements>

<https://www.medicalnewstoday.com/articles/326381#benefits>



Human Growth Hormone

When it comes to building *speed, strength, and recovery*, Human Growth Hormone (HGH), has often been touted as one way to get an edge. *Humans naturally produce growth hormone*, which controls how the body grows from childhood to adulthood. Growth hormone levels are highest in teens and decrease with age. While adults still produce growth hormone, the levels are much lower than in children and adolescents.

Athletes, however, should know the risks associated with growth hormone from a health and clean sport perspective. *Human growth hormone is on the World Anti-Doping Agency (WADA) Prohibited List, which means athletes found to use it are banned from competition.* Growth hormone is in the category of Anabolic Agents on the World Anti-Doping Agency (WADA) Prohibited List and is prohibited at all times and for all levels of athletes, including *elite, junior, and masters-level athletes.*

Is Human Growth Hormone Same as Steroids?

No, HGH is a peptide hormone, not a steroid. A peptide is a substance from two or more amino acids. People often confuse human growth hormone (HGH) with other substances that can improve athletic ability, *but HGH is not a steroid. Steroids make you stronger and slower!*

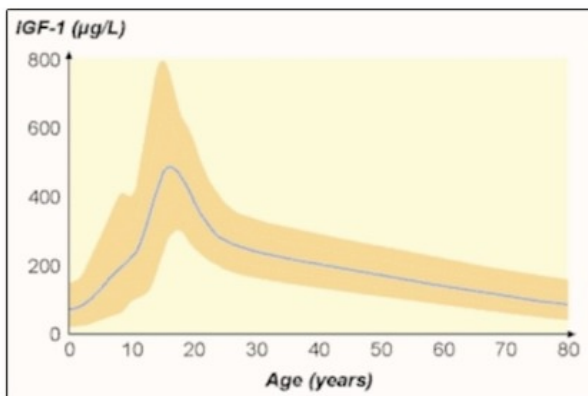
What Does Growth Hormone Do in Sport?

For athletes, HGH selectively *improves anaerobic sprint capacity* but has not been proven to significantly enhance muscle strength, power, or maximum rate of oxygen consumption.

How Can You Get Legal and Safe HGH?

Human Growth Hormone is normally released during sleep. If you consistently get too little sleep (known as "sleep deprivation"), growth hormone is suppressed. Lack of sleep also can affect other hormones.

Teens, **especially athletes, should get between 8-10 hours of sleep every night.** It is during these years that the maximum amount of HGH is delivered during sleep (see chart below). **Sleep your way to improved athletic performance!**



More Info at:

<https://www.healthline.com/nutrition/11-ways-to-increase-hgh#>

<https://www.usada.org/spirit-of-sport/education/growth-hormone-what-athletes-should-know/>

Glucose

Glucose is widely found in a variety of foods. It's the most common form of sugar in plants. **Glucose is the type of sugar that our bodies use for fuel. No matter what forms of sugar we eat, our bodies break most of them down into glucose.**

Glucose traveling through your bloodstream at any given time is known as blood glucose or blood sugar. The body needs energy to function. Your pancreas releases insulin which helps the cells absorb glucose from the bloodstream, feeding your brain, organs and muscles.

As we exercise, glucose is absorbed by the muscles via the blood stream. If there's not enough glucose or blood sugar the body usually doesn't have enough energy to function properly. This is when we can feel tired and fatigued. **Glucose is especially useful for medium to high-intensity exercises that require sustained levels of activity. It can enable athletes to sustain performance at a high level for longer by delaying fatigue. This means that you can improve athletic performance by eating carbohydrates before exercising.**

Why Do Athletes Need Glucose?

Muscle glycogen, the predominant form of stored glucose in the body, and blood glucose are the main energy substrates for muscle contraction during exercise. Sucrose is an ideal substance for athletes to incorporate because it provides both glucose and fructose.

Other Types of Natural Sugars

- **Fructose** is a type of sugar that is found in fruits, honey, and some root vegetables. Fructose is the sweetest of all naturally occurring sugars.
- **Sucrose** is made of one part glucose and one part fructose joined together. Sucrose is naturally found in plants. Table sugar is sucrose.
- **Lactose** is the sugar naturally found in milk and dairy products. Lactose is made up of glucose and galactose.
- **Maltose** is made of two glucose molecules bound together. It naturally occurs as the byproduct of breaking down carbohydrates. It's found in sprouted grains. Grains produce it when they break down starch.

More Info at:

<https://www.meteornutrition.com/blog/2021/1/12/what-athletes-need-to-know-about-sugar>
<https://www.sportsmd.com/sports-nutrition/nutrition/food-athletes-eating-optimize-performance/>
<https://www.quora.com/Is-it-safe-for-a-non-diabetic-to-take-glucose-tablets>

