

Performance and Image Enhancing Drugs

What is Creatine?

Creatine is a naturally occurring compound synthesised from amino acids by the kidneys and liver. Creatine is also contained in foods such as meat, fish and poultry.

Creatine monohydrate is the most commonly used salt form of synthetic creatine. Creatine monohydrate is simply a molecule of creatine accompanied by a molecule of water for added stability. Creatine monohydrate is available commercially, but is classified as a nutritional supplement, not a pharmaceutical grade drug.

Creatine in its pure form is permitted in sport. It is not listed under the Olympic Movement's *World Anti-Doping Code Prohibited Classes of Substances and Prohibited Methods*.

What are the perceived benefits?

Using supplements such as creatine monohydrate may replenish and increase the stores to delay fatigue during intense, brief exercise, as well as reduce recovery time between bouts of exercise. Research in this area seems to support the theory that creatine may benefit certain athletes in certain situations.

Apart from this main benefit of 'supplying energy to the muscles', some believe that creatine can have additional effects:

- o Increasing the volume of muscles (by pulling water molecules into muscle cells)
- o Neutralisation of lactic acid build-up (acting as a 'buffer')
- o Protein-synthesis (increasing muscle mass)

There is less evidence to support these three benefits - they are the subject of much debate at present.

What are the side effects and potential harms?

People using creatine usually experience an immediate weight gain of 1-2 kgs, most likely due to the increase of fluid stores.

Other short-term effects of use that have been reported include:

- o **Muscle cramps**
- o **Tightness in muscles and muscle tears**
- o **Nausea and upset stomach**
- o **Diarrhoea**
- o **Dehydration**

Creatine Monohydrate

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Using creatine monohydrate in higher doses than recommended will not increase the benefits. Sustained high doses may inhibit the body from absorbing creatine in skeletal muscle and interrupt the production of natural creatine in the liver. This is because the body will not waste energy storing or producing creatine if it is already present at high levels. In addition, taking higher doses may place extraordinary stress on the kidneys, as they will have to work harder to remove any unabsorbed creatine from the blood stream.

Another risk is the potential contamination of some preparations with substances other than pure creatine. As is the case with all supplements, creatine supplements are not subject to the same stringent testing as pharmaceuticals. Therefore they may contain impurities that are not listed on the label.

To date, there is no evidence that pure creatine poses immediate problems in healthy people. However, it is recommended that creatine is not used by diabetics or people with impaired kidney function.

The effects of creatine on teenagers and growing bodies are not known. The majority of studies have been on university-aged students and adult athletes. It is recommended teenagers avoid creatine supplements and stick to a healthy diet and exercise plan.

Creatine Monohydrate