



Mashhad University of
Medical Sciences



Exercise Supplements and How to Use



► Citrulline:

Citrulline is an amino acid that is naturally produced in the body. However, taking citrulline from foods or supplements can increase the body level. This increase in level may be beneficial to exercise performance.

One of the effects of citrulline is to increase blood flow to body tissues.

The exercise field may help provide the training muscles with the oxygen and nutrients they need to function well.

► Sodium bicarbonate:

In the exercise field, sodium bicarbonate may help reduce fatigue during exercise, which is characterized by a "burning" sensation in the muscles. This burning sensation indicates an increase in acid production due to the intensity of the exercise.

► BCAAs:

Branched-chain amino acids (BCAAs) are made up of three essential molecules: leucine, isoleucine, and valine.


These amino acids are found in large amounts in many protein-rich foods, especially animal products.



Although they are usually consumed because of their potential muscle-building effects, they are less effective than whole protein for this purpose.

► Nitrate:

Nitrate is a molecule found in vegetables such as spinach, turnips, and beets. Small amounts are also produced naturally in the body. Nitrate may be suitable for exercise because it can be converted into a nitric oxide molecule, which can increase blood flow. Nitrate used as a sports supplement is often obtained from beetroot juice or beet juice.



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The various ingredients in pre-workout supplements improve certain aspects of exercise performance. Some help to increase strength, while others help to increase endurance.

7 Important Ingredients Used in Pre-Workout Supplements

- **Creatine:** Creatine is a molecule found in the cells. It is also a trendy dietary supplement. Research has shown that it can confidently increase muscle mass, strength, and exercise performance. Studies have reported that when people take creatine as a supplement, the strength gain rate is about 5-10% higher than a weight training program.
- **Caffeine:** Caffeine is a natural molecule found in coffee, tea, and other foods and beverages.

It stimulates certain parts of the brain to increase alertness and make to feel less tired.

Caffeine is effective in improving several aspects of exercise performance. It can increase the production capacity or the ability to produce power quickly. It applies to a variety of sports, including sprinting, weightlifting, and cycling.

Studies have also shown that it can improve



performance during long-term endurance events, such as running and cycling, and intermittent activities such as soccer.



- **Beta-alanine:** Beta-alanine is an amino acid that helps fight muscle fatigue. Beta-alanine helps fight acid when it builds up in the body during strenuous exercise. Taking beta-alanine as a supplement increases its concentration in the body and may improve exercise performance. In particular, this supplement may help improve performance during strenuous exercise. However, it may not be as effective as a set during weight training to improve the exercise that lasts less than a minute.