

# PERFORMANCE ENHANCERS FACTS AND BOTTOM LINE

## BETA ALANINE

### What is it?

B-alanine is a naturally occurring amino acid (a non-essential amino acid) not used by the body to make muscle tissue. Rather, research has shown that B-alanine works by increasing the muscle content of an important compound – carnosine. In fact, the production of carnosine is limited by the availability of B-alanine. Carnosine is highly concentrated in muscle tissue where its role is primarily to soak up hydrogen ions.

### Does it work?

B-alanine is one of the few dietary supplements that actually have good scientific evidence that it can possibly enhance performance.

### How does it work?

When you exercise intensely the body produces hydrogen ions. The longer you exercise the more hydrogen ions you produce and this reduces the pH level in your muscles. Muscles work best in a very specific pH range and when the pH drops below that level then muscular performance also starts to decrease. Anything that helps to prevent or delay that drop in pH will help delay muscle fatigue. This is where B-alanine has proven to be very helpful. Beta-alanine increases the levels of carnosine in your slow and fast twitch muscle fibers and carnosine is a buffer that basically soaks up hydrogen ions and so reduces the drop in pH. By keeping your hydrogen ion levels lower, B-alanine allows you to train harder and longer. The bottom line is that B-alanine works by increasing the hydrogen ion buffering abilities of your muscles.

### What benefits does it offer?

B-alanine has been shown to increase muscle strength, increase muscle mass, increase anaerobic endurance, increase aerobic endurance and increase exercise capacity. It has the ability to increase your exercise capacity and this allows you to achieve the other gains.

### How much can it help?

Research to date has shown that B-alanine may improve performance by an average of 2.85%. For example, if you are running a *4 minute mile*, your performance may improve by 7 seconds which is a huge benefit for an elite athlete but of no meaningful importance to the average person.

### Who can benefit?

B-alanine would possibly be useful for athletes that do high intensity activities that result in the build up of hydrogen ions in muscle tissues. This would include athletes who do sustained

# PERFORMANCE ENHANCERS FACTS AND BOTTOM LINE



intense activity lasting 1-7 minutes in duration – rowers, swimmers, martial artists, middle distance runners and sprint cyclists. It is also useful for people who do repeated bouts of intense training such as sprinters, power lifters, weight lifters, circuit trainers, soccer players and hockey players. B-alanine could also potentially be helpful to people who need to do intense efforts at the end of an endurance event such as sprinting to the finish in a half marathon. Please note that if you do not train intensely enough to generate hydrogen ions, B-alanine supplementation will be of little value to you.

## Sources of beta alanine?

B-alanine can be obtained from 3 sources: 1. Your liver makes it; 2. Carnosine rich foods such as beef, pork, chicken and fish, and; 3. Dietary supplements.

## How should it be taken?

The recommended dose is 5-6 grams/day taken in divided doses such as 2 grams taken with breakfast, lunch and supper. B-alanine needs to be taken multiple times a day because the blood levels of B-alanine have been shown to rise and then fall within 2 hour of being taken. There are sustained release forms of B-alanine that eliminate the need to do multiple daily dosing. Taking B-alanine with some carbohydrate will increase its rate of absorption. Carnosine levels can take more than 12 weeks to maximize and B-alanine supplementation has been shown to increase body carnosine levels by as much as 80%.

## Are there any side effects?

The only reported side effect is tingling on the surface of the body – something medically referred to as paresthesia. The sensation of tingling can range from mild to extremely painful and is not associated with any tissue damage. The risk of experiencing paresthesia is greater the higher the dosage you use, particularly if you are taking more than 10mg/kg body weight. This side effect may be eliminated by using a sustained release product. No studies have been done on the potential long term side effects of using B-alanine.

## Are there doping concerns for athletes?

Yes! Athletes who are subjected to anti-doping testing must be extremely careful when it comes to taking any dietary supplement. Many athletes have been suspended for testing positive for a prohibited substance that was not listed on their dietary supplements' label.

## The Bottom Line!

B-Alanine has quality scientific evidence demonstrating that it possibly works to enhance performance in high intense activities lasting 1-7 minutes. Think of B-alanine as a training aid and not as a substitute for training and eating smart. If you do not do intense training you will not benefit from taking B-alanine.

Dr. D. Menard MD, Dip Sport Med  
Sports Medicine Consultant  
Directorate of Force Health Protection



# PERFORMANCE ENHANCERS FACTS AND BOTTOM LINE

