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Role of beta-alanine supplementation on muscle carnosine and exercise performance.

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Source

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Abstract

In this narrative review, we present and discuss the current knowledge available on carnosine and beta-alanine metabolism as well as the effects of beta-alanine supplementation on exercise performance. Intramuscular acidosis has been attributed to be one of the main causes of fatigue during intense exercise. Carnosine has been shown to play a significant role in muscle pH regulation. Carnosine is synthesized in skeletal muscle from the amino acids L-histidine and beta-alanine. The rate-limiting factor of carnosine synthesis is beta-alanine availability. Supplementation with beta-alanine has been shown to increase muscle carnosine content and therefore total muscle buffer capacity, with the potential to elicit improvements in physical performance during high-intensity exercise. Studies on beta-alanine supplementation and exercise performance have demonstrated improvements in performance during multiple bouts of high-intensity exercise and in single bouts of exercise lasting more than 60 s. Similarly, beta-alanine supplementation has been shown to delay the onset of neuromuscular fatigue. Although beta-alanine does not improve maximal strength or VO₂max, some aspects of endurance performance, such as anaerobic threshold and time to exhaustion, can be enhanced. Symptoms of paresthesia may be observed if a single dose higher than 800 mg is ingested. The symptoms, however, are transient and related to the increase in plasma concentration. They can be prevented by using controlled release capsules and smaller dosing strategies. No important side effect was related to the use of this amino acid so far. In conclusion, beta-alanine supplementation seems to be a safe nutritional strategy capable of improving high-intensity anaerobic performance.

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