



Introduction

- Beta-alanine is a non-essential amino acid that increases muscle carnosine levels.
- Carnosine acts as a buffer against hydrogen ion buildup, delaying muscle fatigue during high-intensity exercise.
- Beta-alanine supplementation is gaining attention for improving performance in short-to-moderate duration, high-intensity activities.

Objectives

Main objective: analyze if beta-alanine improve exercise performance in athletes.

Secondary objective: analyze whether there are any differences in potential improvements between females and males.

Methodology

- **Databases searched:** PubMed, SPORTDiscus, MEDLINE, and Google Scholar
- **Inclusion criteria:**
- Beta-alanine supplementation lasting at least 2 weeks
- Supplement dosage ≥ 3 grams per day.
- Population: athletes
- Setting: athletic facilities or laboratories
- Includes one or more outcomes related to exercise performance
- Study design: randomized, double-blind, placebo-controlled trials

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Results

Blood Markers (Lactate & pH Levels)

- No Significant Changes: 6 studies
- Positive Effects:
 - Faster lactate clearance during recovery
 - Increased lactate & bicarbonate post-exercise

Exercise Performance

- No Impact on Strength, Endurance, or VO_2 Peak
- Improved Power Output:
 - Knee extension power
 - Sprint performance & anaerobic power
 - Peak power during endurance

Increased Time to Exhaustion

Recovery & Perceived Exertion

- Trends Toward Improvement:
 - Recovery lactate, reduced exertion, better performance time

Sex-Based Differences

- No Significant Effects in mixed-sex studies
- Positive Effects in male-only studies

Conclusion: Mixed evidence; Beta-alanine shows potential in power output and endurance but lacks consistent support as a reliable ergogenic aid.



Discussion

- **Some performance gains:** Certain studies reported improvements in power output, anaerobic capacity, and time to exhaustion.
- **No major improvements overall:** The majority of studies found no significant effects on maximal strength, muscular endurance, VO_2 peak, or physiological blood markers.
- **Sex differences:** Improvements were more commonly seen in male-only samples, with limited benefits observed in mixed-sex or female groups.
- **Overall interpretation:** Beta-alanine supplementation does not consistently enhance exercise performance among athletes.

Health Implications

Practical Implications

- **Limited Effectiveness:** Beta-alanine supplementation may not be a reliable performance enhancer, saving athletes and coaches time and money.
- **Focus Shift:** Efforts should be directed toward more evidence-backed supplements.
- **Guidance for Practitioners:** This review provides useful insights for healthcare professionals in advising on supplement use.

Implications for Future Research

- **Sport-Specific Studies:** Research should focus on the effects of beta-alanine across different sports.
- **Increased Female Representation:** More studies should include female athletes.
- **Long-Term Effects:** Long-term studies are needed to evaluate potential benefits or risks.
- **Standardized Protocols:** Future studies should use standardized testing to improve comparability.

References

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