

# The Effect of Beetroot Juice on the Aerobic Performance of Endurance Athletes: a Literature Review

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Submitted: October 14, 2024; Accepted: November 20, 2024

## Abstract

The aim of this study is to analyse the impact of beetroot juice on the aerobic capacities of endurance athletes based on the available literature. The use of beetroot juice is recognized as an effective supplement for enhancing athletic performance, as supported by findings from the International Olympic Committee and the Australian Sports Institute. Increased dietary nitrate ( $\text{NO}_3^-$ ) intake prior to exercise has been shown to positively affect cardiovascular function, muscle strength, and endurance. However, the potential ergogenic effect of beetroot juice in highly trained athletes remains unclear. Within this literature review, 15 studies meeting the selection criteria were analysed, involving a total of 258 participants. Results suggest that the consumption of beetroot juice may improve aerobic capacities across various endurance sports, but the physiological responses and performance improvements may depend on the athlete's level and training intensity. Further research is needed to better understand the effects of beetroot juice on different sports disciplines and athlete populations.

**Keywords:** beetroot juice, dietary nitrate, endurance, aerobic endurance, athletes

## Introduction

According to the International Olympic Committee (IOC), the use of beetroot juice is classified as an effective form of supplementation for improving performance when used according to guidelines, based on “compelling evidence of the positive effects of beetroot juice consumption” (Maughan et al., 2018). The Australian Institute of Sport also lists beet juice ( $\text{NO}_3^-$ ) in category A, stating that it “may support or enhance physical performance”