**Effect of acute and chronic exercise in hypoxia combined with nitrate supplementation on the performance of athletes: a review**

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**Introduction**

Athletes and performance

- Performance optimizer (¹)
- Low availability of oxygen (hypoxia)
- Specific muscular adaptations (²)

Altitude training

- Nutritional ergogenic
- Precursor for nitric oxide (NO)
- NO₃ → nitrite (NO²) → NO
- Accentuated effect in hypoxia (³)

Dietary nitrate (NO₃⁻)

**Objectives**

The aim was to review the effect of acute and chronic exercise in hypoxia combined with nitrate supplementation on the performance of athletes.

**Methods**

- Reviews
  - Meta-analyses
  - Animal studies
  - Inaccessible full text
  - Without NO₃
  - Without adequately assessed performance

- Exposure to hypoxia combined with NO₃ supplementation:
  - Acute: 13 articles
  - Chronic: 2 articles

**Results**

Acute effect of both strategies combined

7 studies: NO ³ - attenuated the effects of hypoxia exposure (4,5,6,7,8,9,10)

Chronic effect of both strategies combined

↑ type IIa muscle fibers in sprint interval training: ↑ performance in short maximal exercise (17)

6 studies: Did not evidenced improvements in performance (11,12,13,14,15,16)

Endurance performance was unchanged after 5-6 weeks (17,18)

**Conclusion**

Considering the contradictory data and limitations found, further studies are needed to better understand the effect of acute and chronic exercise in hypoxia combined with nitrate supplementation on the performance of athletes.

**References**