

A low-angle, close-up shot of a person's legs and feet as they run on a track. The runner is wearing dark-colored athletic shoes with a prominent, light-colored, grid-like tread pattern on the soles. The background is heavily blurred, showing streaks of light and color, suggesting a fast-paced environment. A bright sun flare is visible in the upper left corner, casting a warm, golden glow over the scene. The overall composition is dynamic and energetic.

LONG-DISTANCE RUNNING

STRENGTH AND CONDITIONING TRAINING

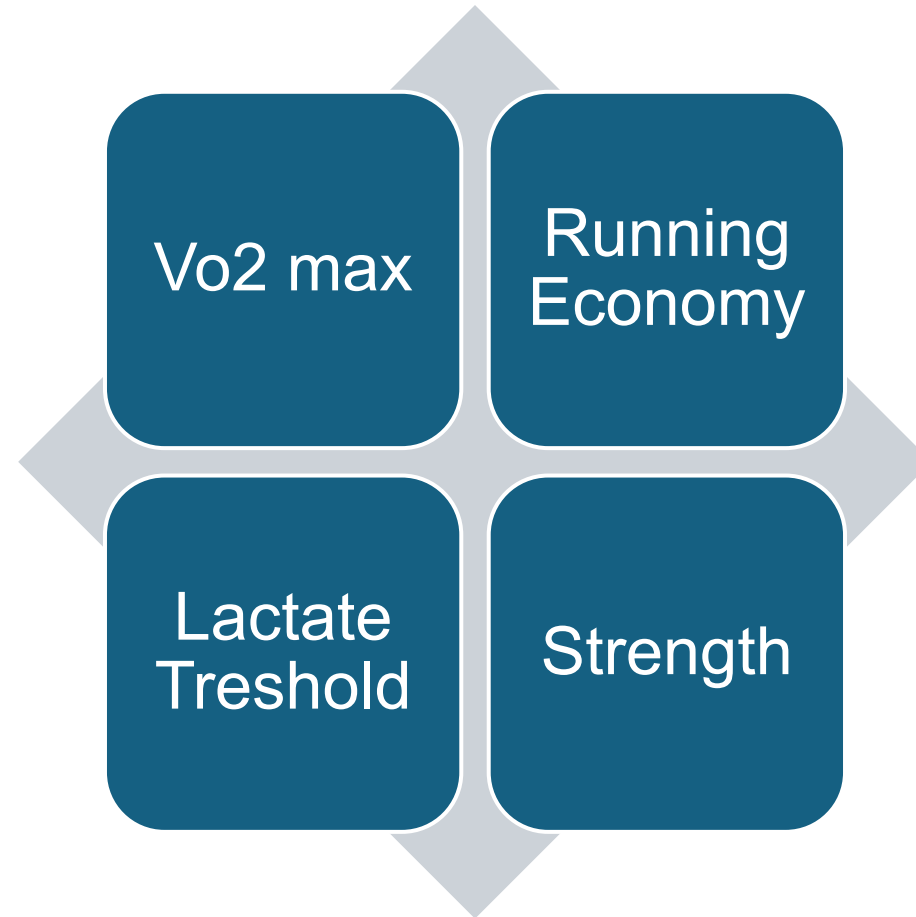


Introduction

Understanding the importance of strength training for long-distance runners

- Physiological determinants of performance
- Implementation of strength training in the training plan in different parts of the season
- The importance of strength training to avoid injuries

Physiological determinants of running performance



Venturini, E., & Giallauria, F. (2022). Factors Influencing Running Performance During a Marathon: Breaking the 2-h Barrier. *Frontiers in Cardiovascular Medicine*, 9(1). <https://doi.org/10.3389/fcvm.2022.856875>



What does training look like?

- 2-3 competitions
- 80/20
- Preparation period
- Competition period

Haugen, T., Sandbakk, Ø., Seiler, S., & Tønnessen, E. (2022). The Training Characteristics of World-Class Distance Runners: An Integration of Scientific Literature and Results-Proven Practice. *Sports Medicine - Open*, 8(1). <https://doi.org/10.1186/s40798-022-00438-7>

Preparation period

General preparation

- Building up mileage
- Mostly easy runs
- 2-3 strength training sessions

Specific preparation

- Increase of intensity
- Mostly easy runs
- 2-3 strength training sessions



Pre competative period and competition period



Why runners should do strength training

- Improved running economy
- Increased anaerobic capacity
- $\dot{V}O_2$ max?
- Increased strength
- Improved neuromuscular efficiency and delayed fatigue
- Improved competition performance
- Injury prevention

Blagrove, R. C., Howatson, G., & Hayes, P. R. (2017). Effects of Strength Training on the Physiological Determinants of Middle- and Long-Distance Running Performance: A Systematic Review. Sports Medicine, 48(5), 1117–1149. <https://doi.org/10.1007/s40279-017-0835-7>



Strength training for long-distance runners



Heavy strength training (1-6 reps at 80-90% of 1RM)



Plyometrics (box jumps and other jumping exercises)



Lower limb focus (Squats, deadlifts, calf raises, leg press etc.)



2-3 times per week

Frequent injuries and prevention

Overuse injuries

- Runners knee
- Shin splints
- Plantar fasciitis
- Ankle sprains
- Stress fractures

Resistance training

- Gradually increased load
- Frequent de-load weeks

Sources

- Blagrove, R. C., Howatson, G., & Hayes, P. R. (2017). Effects of Strength Training on the Physiological Determinants of Middle- and Long-Distance Running Performance: A Systematic Review. *Sports Medicine*, 48(5), 1117–1149. <https://doi.org/10.1007/s40279-017-0835-7>
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- Rønnestad, B. R., & Mujika, I. (2013). Optimizing strength training for running and cycling endurance performance: A review. *Scandinavian Journal of Medicine & Science in Sports*, 24(4), 603–612. <https://doi.org/10.1111/sms.12104>
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