

Calculating the best time to compete after altitude training

April 4 2014, by Stacy Brooks

Altitude training is a popular practice used by elite athletes to improve endurance in competitions, such as marathons and cycling races, that take place at sea level. Training at in a lower-oxygen environment (at elevations between 2,000–3,000 meters) jumpstarts the body's production of red blood cells. More red blood cells supply the muscles with more oxygen and increase endurance. Even after returning to sea level, the performance-enhancing physiological changes remain for days and weeks, providing athletes with an extra competitive edge during races.

While a number of studies focus on the optimal time to begin [altitude training](#) before competition, few address the best time to come down from altitude and how long athletes should wait to reacclimatize before competing. Robert F. Chapman et al. search for the answers in the new review article "Timing of return from altitude training for optimal sea level performance," published in the *Journal of Applied Physiology*.

From the authors: "We propose that the optimal time to compete after return to sea level after chronic altitude training will be influenced primarily by the interaction of three components: timing of the decay in [red blood cell](#) mass, consequences of ventilatory acclimatization, and alterations in biomechanical and neuromuscular factors associated with force production. As research efforts continue in the search to elucidate the best practices and application of altitude training for endurance performance, we believe the issue of timing of return to [sea level](#) prior to competition, largely ignored, deserves special focus."

More information: Robert F. Chapman, Abigail S. Laymon Stickford, Carsten Lundby, and Benjamin D. Levine. "Timing of return from altitude training for optimal sea level performance." *J Appl Physiol* April 1, 2014 116:(7) 837-843; published ahead of print December 12, 2013, [DOI: 10.1152/jappphysiol.00663.2013](https://doi.org/10.1152/jappphysiol.00663.2013)

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