

Altitude training: Study puts some data behind conventional wisdom

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Altitude training is a popular technique among athletes preparing for a competition, especially expert runners. Much research has been conducted on how to do it, at what altitude to train, how to modify workouts and how long to stay at altitude. However, a major unanswered question is when should an athlete return from altitude to compete?

Coaches of elite runners generally take one of two sides.

"They either believe an athlete should compete within 48 hours of coming back from altitude or in the 18- to 22-day range after returning," said Robert Chapman, <u>exercise physiologist</u> in the School of Health, Physical Education and Recreation at Indiana University Bloomington. "But there is little scientific evidence showing why these coaches' opinions are valid."

His study, discussed on Thursday during the American College of <u>Sports</u> <u>Medicine</u> annual meeting on Thursday, suggests that both camps might be right.

About the study:

• Six elite distance runners lived in Flagstaff, Ariz., for 28 days at an altitude of 2,150 meters. They followed a "live high, train low" altitude training program, which means that although the athletes lived at a high altitude, they trained at 1,000 meters to do



harder and faster workouts a few times per week. After returning from the 28-day camp, the runners were tested over the course of 26 days. Researchers focused on testing <u>heart rate</u>, running economy and mechanics.

• <u>Physiological data</u> shows that what most coaches say is true. Several variables showed that 48 hours is a good time to compete based on breathing results, while Day 7 and 13 showed more difficulty.

Chapman said this might be attributed to a concept referred to as ventilatory acclimatization.

"At altitude, a person breathes more, and that extra breathing stays with you when you come back down from altitude. Extra breathing uses more muscles, more energy, and the body has to work more to regulate <u>blood</u> <u>flow</u>," he said.

This study suggests that an athlete may perform best at 18 to 22 days because the extra breathing goes away and the body gets re-acclimated to a lower altitude.

"This research will help athletes plan for major competitions," says lead author Abby Laymon, graduate student in the School of HPER's Department of Kinesiology. "For example, if an athlete is training for the Olympic trials, they can count backwards and plan their workout accordingly to perform their best after <u>altitude</u> training."

More information: The study, "Time-course of changes in cardiorespiratory measures post-altitude training: Implications for competitive endurance performance," was discussed on Thursday during the High Altitude/Hypoxia I session.



Provided by Indiana University

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