ESSR Journal Club

Covered Article: “Heat Versus Altitude Training for Endurance Performance at Sea Level”
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Definitions:
- **heat training** = The practice of supplementing usual training in temperate conditions (5-18°C) with ≥ 90 minutes/day of exercise completed at an intensity that elicits a core body temperature ≥ 38.5°C on ≥ 10 consecutive days.
- **altitude training** = The practice of living at an elevation of 2,000-2,500 m and training at elevations < 1,250 m (“live high-train low) for ≥ 3 weeks.

1) Explain the similar and distinct mechanisms by which heat training and altitude training may elevate hemoglobin mass.

2) What are some reasons why plasma volume expansion may provide a greater performance benefit to an untrained vs. an endurance-trained individual?

3) How do heat training and altitude training influence the variables included in the Fick equation (V̇O₂ = Q x a-V̇O₂ difference)? How might the time course of these adaptations differ for the two training modalities?

4) Prepare a list of considerations for advising an endurance athlete on whether (or not) they should undertake altitude training or heat training in preparation for competition.

5) Discuss the challenges (e.g., accessibility, time) to natural heat training and altitude training practices. Can you think of any strategies to overcome these challenges?

6) When would be an optimal time for an athlete to compete following altitude training and heat training? Explain why.

7) Discuss the importance of the non-hematological mechanisms associated with heat training vs. altitude training for improving endurance sea-level performance in temperate conditions.

8) Alamosa, Colorado is situated at an elevation of approximately 2,299 m and reaches temperatures that exceed 30°C in the summer months. Do you think training in this type of environment could result in a synergism or additive benefits for performance or would the two likely detract from overall performance gains? Explain why.

9) Draw a figure detailing the specific mechanisms contributing to plasma volume expansion following heat training and elevated hemoglobin mass following altitude training, respectively.