

Morton, R. H.

Modelling human power and endurance. (English) Zbl 0717.92012
J. Math. Biol. 28, No. 1, 49-64 (1990).

A generalized three component hydraulic model has been proposed to represent the human bioenergetic processes relating internal energy stores to performance during exercise, and into recovery. Further development of the model allows testable predictions to be made. In particular, the author examines certain hypotheses of chemical fuel shortage as a subgroup of the potential causes of fatigue, and their implications for maximal power and for endurance. The assumption that the limitation to sustainable power is direct proportional to the glycogen store remaining, appears the most feasible. Based on this assumption, equations for the decline in maximum attainable power over time, the endurance at fixed workrates and the endurance at incremental tests (as a function of the increment slope) are obtained.

MSC:

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Keywords:

anaerobic threshold; energy metabolism; exercise performance; exhaustion; generalized three component hydraulic model; human bioenergetic processes; internal energy stores; chemical fuel shortage; fatigue; maximal power; endurance; glycogen store

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