

Impact of 5 Days of Sprint Training in Hypoxia on Performance and Muscle Energy Substances.

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Abstract

The present study was designed to determine the effect of 5 consecutive days of repeated sprint training under hypoxia on anaerobic performance and energy substances. Nineteen male sprinters performed repeated sprints for 5 consecutive days under a hypoxic (HYPO; fraction of inspired oxygen [F_{iO_2}], 14.5%) or normoxic (NOR; F_{iO_2} , 20.9%) condition. Before and after the training period, 10-s maximal sprint, repeated sprint ability (5×6-s sprints), 30-s maximal sprint, and maximal oxygen uptake (VO_{2max}) tests were conducted. Muscle glycogen and PCr contents were evaluated using carbon magnetic resonance spectroscopy (^{13}C -MRS) and phosphorus magnetic resonance spectroscopy (^{31}P -MRS), respectively. The HYPO group showed significant increases in power output during the 10-s maximal sprint ($P=0.004$) and repeated sprint test ($P=0.004$), whereas the NOR group showed no significant change after the training period. Muscle glycogen and PCr contents increased significantly in both groups ($P<0.05$, respectively). However, relative increases were not significantly different between groups. These findings indicated that 5 consecutive days of repeated sprint training under hypoxic conditions increased maximal power output in competitive sprinters. Furthermore, short-term sprint training significantly augmented muscle glycogen and PCr contents with little added benefit from training in hypoxia.