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The effects of training on aerobic power and excess post exercise oxygen consumption

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The purpose of this study was to investigate the effects of training on aerobic power and the relationship to excess post exercise oxygen consumption (EPOC) after supramaximal exercise. Ten untrained males participated in a six week training study. The subjects performed pre and post training VO₂max tests and anaerobic speed tests (ASTs). EPOC volume and EPOC rate components (t_1 and t_2) as well as blood lactate responses were measured following a two minute supramaximal exercise test. Significant differences were evident between pre and post training VO₂max (46.38 ± 3.74 ml.kg⁻¹.min⁻¹ vs. 51.82 ± 5.21 ml.kg⁻¹.min⁻¹ and 3.61 ± 0.42 l.min⁻¹ vs. 4.00 ± 0.44 l.min⁻¹; $P < 0.05$). EPOC volume was significantly decreased following training (9.13 ± 1.68 l vs. 7.49 ± 1.73 l; $P < 0.05$). Significant differences were found between pre and post training t_1 (2.69 ± 0.19 min vs. 2.29 ± 0.33 min; $P < 0.05$) and t_2 (43.74 ± 5.12 min vs. 39.63 ± 4.24 min; $P < 0.05$). Blood lactate response was significantly decreased following training (15.28 ± 1.80 mmol.l⁻¹ vs. 13.36 ± 1.55 mmol.l⁻¹; $P < 0.05$). A significant relationship was found between the change in VO₂max and the change in blood lactate concentration ($r = 0.73$; $P < 0.05$). No significant relationships were evident between VO₂max, EPOC volume, or EPOC recovery rates ($P > 0.05$). Findings indicated that aerobic training could decrease the VO₂ recovery volume and rate, as well as decrease the blood lactate response associated with anaerobic exercise. However, the rate and magnitude of the recovery VO₂ from supramaximal work appear to be independent of VO₂max.

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