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Sodium phosphate loading improves laboratory cycling time-trial performance in trained cyclists.

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Sodium phosphate loading has been reported to increase maximal oxygen uptake (6-12%), however its influence on endurance performance has been ambiguous. The aim of this study was to examine the influence of sodium phosphate loading on laboratory 16.1km cycling time-trial performance. Six trained male cyclists (V O(2) peak, 64.1+/-2.8mlkg(-1)min(-1); mean+/-S.D.) took part in a randomised double-blind crossover study. Upon completion of a control trial (C), participants ingested either 1g of tribasic dodecahydrate sodium phosphate (SP) or lactose placebo (P) four times daily for 6 days prior to performing a 16.1km (10 mile) cycling time-trial under laboratory conditions. Power output and heart rate were continually recorded throughout each test, and at two points during each time-trial expired air samples and capillary blood samples were taken. There was a 14-day period between each of the supplemented time-trials. After SP loading mean power was greater than for P and C (C, 322+/-15W; P, 317+/-16W; SP, 347+/-19W; ANOVA, $P<0.05$) and time to complete the 16.1km was shorter than P, but not C (ANOVA, $P<0.05$). During the SP trial, relative to the P, mean changes were mean power output +9.8+/-8.0% (+/-95% confidence interval); time -3.0+/-2.9%. There was a tendency towards higher V O(2) after SP loading (ANOVA, $P=0.07$). Heart rate, V (E), RER and blood lactate concentration were not significantly affected by SP loading. Sodium phosphate loading significantly improved mean power output and 16.1km time-trial performance of trained cyclists under laboratory conditions with functional increases in oxygen uptake.