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Effects of an Exogenous Ketone Supplement on Five-Kilometer Running Performance

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Athletes of all varieties are constantly trying to find ways to improve their performance. Recently, ketone supplements have emerged and may be used to rapidly increase ketone body availability, without the need to first adapt to a very low carbohydrate ketogenic diet. However, the extent to which these ketone bodies affect substrate metabolism during exercise and athletic performance remains to be determined. **PURPOSE:** To assess exercise performance time and related physiological, metabolic and perceptual responses of recreational endurance runners after ingestion of a commercially available oral ketone supplement. **METHODS:** Recreational endurance runners ($n = 10$; age: 20.8 ± 1.03 years; weight: 68.9 ± 5.6 kg; height: 175.6 ± 4.9 cm) participated in a double-blind, crossover, repeated-measures study where they were randomized to 300 mg kg⁻¹ body weight of an oral ketone supplement (KS) or a flavor matched placebo (PLA) 60 minutes prior to performing a 5-km running time trial (5KTT) on a treadmill. Time, heart rate, RPE, and affect, were recorded at 500-m intervals during the TT. Session RPE and affect were obtained post TT. Metabolic measures (RER, VO₂, VCO₂, and V_E) were measured during the 5-km. Plasma glucose, lactate and ketones were measured at baseline, 60 minutes post-supplement, and immediately following the TT. **RESULTS:** Plasma β -hydroxybutyrate (β HB) was elevated from baseline and throughout entire protocol in the KS condition ($p < 0.05$). Although, no significant differences ($p = 0.100$) were observed in TT performance, 8 of the 10 subjects ran faster ($p = 0.001$) during the KS (1443.9 ± 208.5 s) compared to PLA (1543.5 ± 242.2 s). No other differences ($p > 0.05$) were noted in any of the other physiological, metabolic or perceptual measures. **CONCLUSION:** Ingestion of a commercially available ketone supplement prior to exercise resulted in a significant elevation of plasma β HB within 60-min of consumption. No significant differences were noted in time for the 5-km between trials, however 80% of the subjects performed the TT faster during the KS condition and were deemed responders. When comparing KS to PLA in responders only, significantly faster times were noted when consuming the KS compared to PLA.

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