Effects of Energy Drink Functional Ingredients on Running Performance

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The claims for the ergogenic effects of the functional ingredients of energy drinks such as caffeine, taurine, and glucose, by manufacturers are ambiguous. It is common for athletes to consume energy drinks prior to competition, yet the efficacy of the functional ingredients contained in these drinks remains to be determined, especially in short duration high intensity endurance events. **PURPOSE:** To evaluate the isolated and combined effects of caffeine, taurine, and glucose on exercise performance time as well as related physiological and perceptual responses. **METHODS:** Sixteen recreational endurance runners (10 men, 6 women, 20.88 ± 1.89 years, 69.79 ± 11.36 kg, 177.88 ± 9.22 cm; daily caffeine intake, 113.44 ± 115.99, weekly running distance of 36.11 ± 7.05 km) participated in a double blind, crossover, repeated measures study. Participants completed a 5-km running time trial on the treadmill for each visit. In the first session the subjects performed the test without drink (control trial). Subjects were randomly assigned to supplement with 500 ml of a commercially available energy drink, caffeine (160 mg), taurine (2g) and glucose (54g) 60 minutes before completing a 5-km time trial; separated by seven days. Time, heart rate, RPE (RPE-Overall; RPE-Chest; RPE-Legs), and affect were recorded at 500-m intervals during the 5-km time trial. Session RPE and session Affect were obtained 5 min following completion of the 5-km time trial. Time to complete the time trial was recorded. Differences between treatments were assessed using repeated measures and analysis of variance. **RESULTS:** Comparisons among the commercial drink, caffeine, taurine, glucose and the control condition did not show statistically significant differences in the results of the performed test (Control: 1415.12 ± 179.71 s; Energy drink: 1403.56 ± 171.41 s; Caffeine: 1400.06 ± 175.29 s; Taurine: 1418.31 ± 198.39 s; Glucose: 1405.31 ± 185.95; $P = .80$). There were no differences in heart rate, RPE, affect, session RPE, session affect, or the split times measured at 500-m intervals between the five 5-km time trials ($P > 0.05$). **CONCLUSION:** Although the effects of isolated and/or combined consumption of caffeine, taurine, and glucose before exercise were in the expected direction, they did not approach significance with a sample size of 16.

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