Drink composition, voluntary drinking, and fluid balance in exercising, trained, heat-acclimatized boys

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This study examined the effects of beverage composition on the voluntary drinking pattern, body fluid balance, and thermoregulation of heat-acclimatized trained boys exercising intermittently in outdoor conditions (wet bulb globe temperature 30.4 ± 1.0°C). Twelve boys (age 13.4 ± 0.4 yr) performed two 3-h sessions, each consisting of four 20-min cycling bouts at 60% maximal aerobic power alternating with 25-min rest. One of two beverages was assigned: unflavored water (W) or flavored water plus 6% carbohydrate and 18 mmol/l Na (CNa). Drinking was ad libitum. Total intake was higher (P < 0.05) during CNa (1,943 ± 190 g) compared with W (1,470 ± 143 g). Euhydration was maintained with CNa (+0.18% body wt), but a mild dehydration resulted with W (-0.94% body wt; P < 0.05). Sweat loss, much higher than previously published for children of similar age, was similar between conditions (CNa = 1,644.7 ± 117.5; W = 1,750.2 ± 152.7 g). The increase in rectal temperature (CNa = 0.86 ± 0.3; W = 0.76 ± 0.1°C), heart rate, and all perceptual variables did not differ between conditions. In conclusion, a flavored carbohydrate-electrolyte drink prevents voluntary dehydration in trained heat-acclimatized boys exercising in a tropical climate despite their large sweat losses. Because hydration changes were minor, the thermoregulatory strain observed was similar between conditions.