Sodium

Sodium supplementation is important especially to ultra-endurance athletes. Costa et al. (2013) noted that ultra-endurance runners need to ration water at least 12L/day (or 3.17 gallons/day) to maintain euhydration. However, it is difficult for ultra-endurance athletes (e.g. running, cycling, hiking, etc.) to maintain proper hydration not only because of equipment/supplies logistics, but also because of suppressed appetite, race-time nerves, gastric distress, fluid-intake disinterest, and physical stress of the event (Costa et al., 2013). It is important to include adequate sodium in foods or fluids (700 to 1200 mg/L) to stimulate fluid intake, help glucose and water absorption, maintenance of homeostasis, and avoid hyponatraemia which tends to be riskier amongst slower runners averaging less than 8km/hr (Costa et al., 2013). Geesman et al. (2014) also noted a fluid intake of 300-500ml/hr (10-17 fluid ounces/hr) may be adequate to maintain hydration for ultra-endurance athletes in temperate conditions.

Sodium is also important to help with glucose absorption. Jeukendrup (2014) noted that current theories believe glucose absorption is attenuated by the sodium-dependent transporter (SGLT1) which reaches saturation at around 60 g/hr. Different carbohydrates metabolize along different paths. For example, fructose absorption relies on GLUT5 which is not sodium-dependent. Jentjens et al. (as cited in Jeukendrup, 2013) studied the absorption of glucose and glucose:fructose mix on a group of cyclists exercising at moderate intensity and found that using the multiple transport exogenous carbohydrate, the 1 g/min oxidation rate barrier could be broken. Jentjens and Jeukendrup (as cited in Jeukendrup, 2013) found that an exogenous glucose:fructose mix ingested at 2.4 g/min yielded 65% higher oxidation rates (peaking at 1.75 g/min) over glucose only. Glucose:fructose far exceeded other tests with glucose:sucrose, maltodextrin:fructose, glucose:maltose, and glucose:sucrose:fructose (Jeukendrup, 2013). Maltodextrin:fructose which is less "sweet tasting" (and therefore more palatable and viable alternative to glucose:fructose) also performed very well with oxidation rates of 1.5g/min when consumed at 1.8g/min (Jeukendrup, 2013).

Maintaining adequate hydration and nutrition is important during any exercise.

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