This study examined fluid intake, weight changes, and palatability of water and a carbohydrate-electrolyte (ECHO) beverage in two groups of eight subjects performing 4 hours of simulated industrial work while wearing impermeable protective clothing. Subjects also rated the palatability of a flavorless orange-colored water and four commercially available orange-flavored fluid-replacement drinks. Subjects worked 30 min at 300 Kcal/hour (moderate work rate), followed by 30 min of rest for a total of 4 hours in each of three environments: 18, 23, 27°C wet bulb globe temperature (WBGT). Eight subjects drank water and eight drank an ECHO beverage (Drink 1). Mean sweat production was similar between groups at each WBGT (p > 0.05). Mean weight changes expressed as percentage of total body weight for the water drinking group were -0.25 (± 0.16) kg in 18°C, -0.55 (± 0.09) kg in 23°C, and -0.93 (± 0.13) kg in 27°C. Mean weight changes for the ECHO-drinking group were 0.49 (±0.12) kg in 18°C, 0.13 (±0.12) kg in 23°C, and -0.02(±0.14) kg in 27°C. Each change was significantly different from that of the water-drinking group at the same temperature (p<0.05). Mean pre- to post-trial palatability rating results for all temperatures revealed differences in taste perception with strong preferences for Drinks 1 and 2 (pre to post): Drink 1, 3.8 to 3.6; Drink 2, 3.8 to 3.7; Drink 3, 3.0 to 2.7, Drink 4 (water), 3.2 to 3.0, and Drink 5, 2.1 to 1.6. Drinks 1 and 2 were rated significantly more palatable (p<0.05) than Drink 3. all drinks had a reduced flavor appeal from 3.18 (+0.96) preratings to 2.92 (+1.01) postratings (p<0.05). Mean voluntary consumption during work across the three temperatures was 1561.5 mL (±720.1) for ECHO versus 1062.7 mL (± 666.4) for water (p=0.054). The water group experienced greater weight loss than the ECHO group, suggesting a greater rate of dehydration when water was used for fluid replacement.