

Green Tea Beverages Contributes to Restoration of Body Fluid Balance to the Same Degree as Water Intake of Green Tea Beverages during Mild Dehydration Confirmed to Not Promote Urinary Excretion

ITO EN, Ltd. (President: Daisuke Honjo; headquartered in Shibuya-ku, Tokyo) has collaborated with Nara Women’s University to confirm that the intake of green tea beverages during mild dehydration restores the body’s fluid balance and that the caffeine in green tea beverages does not promote urinary excretion. These trial findings have been published in the academic journal European Journal of Nutrition^{*1}.

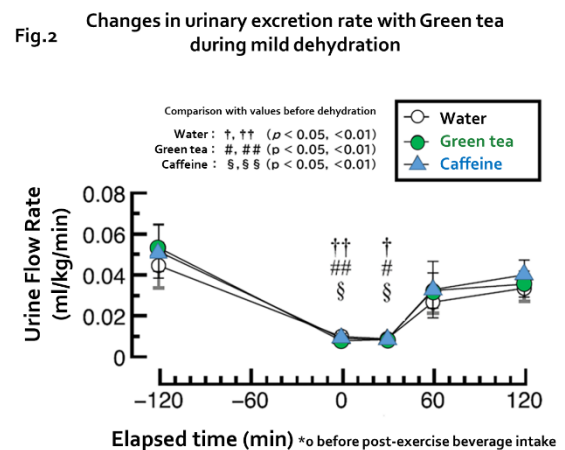
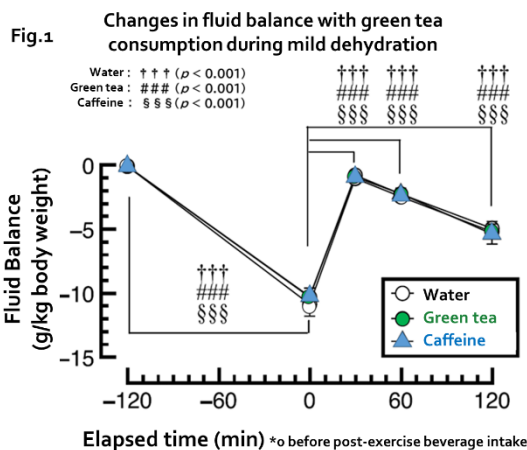
In recent years, heatstroke^{*2} has been known to happen not only during sports and other outdoor activities but also indoor and at night. Because of this, it is encouraged that you “frequently hydrate” even if you are not thirsty as a way to prevent dehydration, which increases the risk of heatstroke.

As such, Nara Women’s University and our research team have examined the effects of green tea beverages during mild heat dehydration on body fluid balance and renal water and electrolyte excretion responses through a randomized crossover study^{*3} to confirm whether green tea beverages containing caffeine are suitable for drinking during dehydration.

○Trial details

Healthy adult male and female participants did three 20-minute stepping exercises with 10-minute breaks in-between, inducing mild dehydration. After that, they would drink an amount of water equivalent to their fluid loss, green tea beverage, or water containing the same amount of caffeine as the green tea beverage (20 mg/100 ml; caffeinated water), followed by measurement of fluid balance, urine excretion rate, etc. two hours after ingestion.

The results showed that the exercise induced a hypohydration of about 1% of the participants’ body weight, and that by ingesting a volume of water equivalent to the water lost, the body fluid balance was temporarily restored to the state prior to dehydration. During the subsequent two hours, body fluid volume decreased again chiefly due to urine excretion. The water retention rate in the second hour after ingestion was 52.2 ± 4.2% for water, 51.0 ± 5.0% for green tea beverage, and 47.9 ± 6.2% for caffeinated water, indicating that there are no statistically significant difference between them, with each showing a significant recovery in body fluid volume from the dehydrated state (Figure 1). Moreover, the excretion rate of water and electrolytes from urine in the two hours after hydration was similar for water, green tea beverage, and caffeinated water, so the intake of green tea beverage or caffeinated water did not increase the urine excretion rate compared to water intake (Figure 2).



The results of this research **suggest that green tea beverages restore body fluid volume to the same degree as water when drunk for hydration during mild dehydration.** As such, we may expect green tea beverages also to contribute to hydration for the health maintenance of people of all ages. As a Health Creation Company, we will contribute to creating healthy and fulfilling lifestyles for customers and a sustainable society from various standpoints, not only conducting research that contributes to the development of products with health appeal, but also actively engaging in research that addresses customers' concerns and questions about health.

*1 Takamata A. et al., Effect of fluid replacement with green tea on body fluid balance and renal responses under mild thermal hypohydration: a randomized crossover study. *European Journal of Nutrition* | Published: 18 August 2023 (<https://doi.org/10.1007/s00394-023-03236-3>) Takamata A. et al., Effect of fluid replacement with green tea on body fluid balance and renal responses under mild thermal hypohydration: a randomized crossover study. *European Journal of Nutrition* | Published: 18 August 2023 (<https://doi.org/10.1007/s00394-023-03236-3>)

*2 Heat stroke is a condition where the balance of water and salt in the body gradually breaks down due to prolonged exposure to a hot and humid environment, causing thermoregulation to function poorly and heat to accumulate in the body. (From the Ministry of Health, Labour and Welfare, "For Heatstroke Prevention" leaflet)

*3 Randomized crossover trial. This is evaluation and comparison of the effects of multiple treatments and interventions by randomly alternating treatments and interventions among the participants.