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Effects of plant-based beverage consumption on serum levels of thyroid hormones

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Consumption of functional beverages has a significant impact on human health. This study aimed to develop a new plant-based beverage that incorporates extracts from cruciferous vegetables and pumpkin, offering a new formulation in the beverage industry with potential health-promoting properties. To achieve this, hydroethanolic (70%) extracts were prepared from selected plants, and their antioxidant capacity was assessed using the DPPH method. In addition, the physicochemical, microbial, and sensory characteristics of the beverage samples were evaluated. To investigate the effects of these beverages on thyroid function in humans, serum levels of thyroid-stimulating hormone (TSH) and thyroxine (T_4) were measured before and after a one-month consumption period. The results demonstrated a high level of free radical scavenging activity by the extracts, particularly at a concentration of 800 µg/mL. In the analysis of the beverages' antioxidant activity, increasing the extract concentration enhanced antioxidant properties. Prolonged storage (up to 90 days) led to a gradual decline in these properties. Assessment of thyroid hormone levels revealed no significant change in serum T_4 after one month of beverage consumption ($P > 0.05$). Although TSH levels decreased during the consumption period, they remained within the normal reference range (0.32–5.2 mU/L) before and after the intervention. Overall, the findings suggest that the developed herbal beverage possesses notable antioxidant activity due to the presence of bioactive compounds and may contribute to human health. Furthermore, it appears to exert no adverse effects on thyroid gland function.

Keywords: Antioxidant activity, Plant extract, Functional foods, Thyroid gland hormones