Abstract

Mountaineering is a physically demanding activity that leads to mountain anorexia at high altitudes (>2,500 m), reducing food intake and increasing the risk of inadequate energy, protein, and dietary fiber consumption. Combined with limited access to fresh foods, these challenges highlight the need for practical and nutrient-dense snacks suitable for mountain climbers. A dietary habits survey involving 44 mountain climbers showed snack choices were largely dominated by sugar-rich products, indicating the need for convenient and healthier snack alternatives. However, while chia seeds are highly nutritious, incorporating them can affect the sensory profile and stability of the food matrix due to their strong gelling capacity. Therefore, this study developed an innovative pear fruit leather enriched with chia seeds as a functional snack, while measuring its sensory acceptability (9-point hedonic scale and preference ranking) and its physicochemical stability over 28 days at 4 °C, 25 °C, and 35 °C. Chia seed concentration served as the independent variable, with three formulations evaluated: F1 (3.5 g), F2 (8 g), and F3 (12.8 g). Different levels of chia seeds affected appearance, firmness, and stickiness ($p < 0.05$) according to repeated-measures ANOVA, whereas flavor, chewiness, granularity, overall liking, and preference ranking showed no significant differences. Increasing chia seed concentration significantly affected color, puncture force, moisture content, water activity, and pH, with F1 and F2 exhibiting minimal changes in stability. Therefore, incorporating up to 8 g of chia seeds demonstrates the most favorable balance between sensory acceptance and physicochemical stability and is recommended for further development and commercialization.

Keywords: *chia seeds, fruit leather, mountaineering, physicochemical stability, sensory evaluation*