

Abstract

The growing interest in plant-based foods has encouraged the development of protein-enriched snack products, including cereal bars. This study evaluated the effects of soy protein isolate (SPI), pea protein isolate (PPI), and oat protein isolate (OPI) on the physicochemical and sensory properties of cereal bars. Four formulations were prepared using a no-bake method, consisting of a control without protein isolate and three protein-fortified formulations containing SPI, PPI, or OPI. The cereal bars were analyzed for crude protein, moisture content, color, texture profile, hedonic liking, and ranking preference. The incorporation of plant protein isolates significantly increased crude protein content from $5.19 \pm 0.15\%$ in the control to $21.9 \pm 0.32\%$ in SPI, $17.5 \pm 0.15\%$ in PPI, and $20.1 \pm 0.25\%$ in OPI, while SPI also showed higher moisture content at $10.29 \pm 0.16\%$. Protein-fortified cereal bars showed higher hardness and chewiness than the control, and instrumental color values differed significantly among formulations. However, appearance and color liking were not significantly different. Sensory evaluation showed that overall liking scores were 6.36 ± 1.38 for the control, 6.56 ± 1.39 for SPI, 6.22 ± 1.58 for PPI, and 4.28 ± 1.91 for OPI, with OPI showing significantly lower overall liking and flavor-related scores. In the ranking test, SPI was most frequently selected as the preferred sample, whereas OPI was most frequently selected as the least preferred sample. Overall, SPI showed the most favorable balance under the conditions tested because it increased crude protein content while maintaining sensory liking comparable to the control and PPI formulations.

Keywords: *cereal bar, plant protein isolate, soy protein isolate, pea protein isolate, oat protein isolate, sensory liking*