

Abstract

Synbiotics, a combination of prebiotics and probiotics, offer promising benefits for improving gut health and enhancing immune function. However, conventional synbiotic food options can be inconvenient for modern consumers. This study aimed to develop a synbiotic powdered drink using jicama (*Pachyrhizus erosus*) as the functional prebiotic source, *L. acidophilus* as the probiotic, and skim milk as the protective carrier. Jicama was processed into powder form using the foam mat drying method, and its chemical properties, namely total carbohydrate, reducing sugar, and inulin content, were analyzed. Its prebiotic potential was also evaluated through microbial enumeration. The probiotic component was freeze-dried with varying skim milk concentrations (10%, 20%, 30%) and assessed for viability. Both components were then combined into a synbiotic formulation and analyzed for the moisture content, water activity, solubility, and color. Results showed that the drying process significantly influenced jicama's chemical characteristics, yielding 98.86 g/100g carbohydrate, 30.33 g/100g reducing sugar, and 6.98 g/100g inulin content. Jicama-derived inulin also demonstrated comparable growth-promoting effects on *L. acidophilus* to commercial inulin. All synbiotic formulations maintained viable probiotic counts above 10^{10} CFU/mL, with increasing skim milk concentration enhancing probiotic survival, solubility, and lightness while reducing moisture content. These findings support the use of jicama as an effective prebiotic source and skim milk as a protective medium for probiotic viability in powdered drink applications.

Keywords: *synbiotic powdered drink; jicama; Lactobacillus acidophilus; skim milk*