Formulation and Quality Evaluation of a Synbiotic Concentrated Type Yogurt Incorporating Chickpea Flour and Wood Apple Pulp Powder

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Yogurt is a fermented dairy product containing probiotics important for digestive health. Chickpea is a protein and fiber-rich legume with prebiotic effects. Developing a probiotic yogurt incorporating chickpeas could produce a synbiotic product and can boost gut bacteria. Therefore, the objective of this study was to formulate a synbiotic concentrated type of yogurt with chickpea flour and wood apple pulp powder. A preliminary study was conducted to determine the amount of wood apple powder to be added. Using the selected wood apple percentage (7.5%), 4 formulations were developed with 0%, 1%, 2.5%, and 5% chickpea flour. The pH, titratable acidity, viscosity, percentage of susceptibility to syneresis, percentage of water holding capacity, the viability of probiotic organisms, and sensory attributes of yogurts and the moisture content, crude fiber, ash, crude protein, and crude fat of formulations were determined. The results demonstrated that chickpea flour stimulated the growth of *lactobacilli* after 14 days of storage. The numbers of viable probiotic bacteria in treatments were in the range of 6.2-7.9 log CFU/mL for *lactobacilli* in *Rogosa* agar media. During refrigerated storage, probiotics maintained a viable count above the minimum therapeutic level (10^6 CFU/g) in all yogurt formulas. There was no significant difference ($P>0.05$) in the pH and acidity among the treatments. However, with increasing chickpea flour percentage, the viscosity, water holding capacity, total solids, ash content, crude protein content, and crude fiber content were increased. There was no significant difference ($P>0.05$) in sensory properties comparing plain wood apple yogurt (0% chickpea flour) with 1%, 2.5%, and 5% chickpea flour added samples. Therefore, results suggest that a synbiotic concentrated type yogurt could be formulated by adding up to 5% chickpea flour to enhance protein and fiber content and wood apple pulp flour without adverse effects on the sensory and physicochemical properties.

Keywords: Chickpea, Concentrated type yogurt, Probiotic, Synbiotic, Wood apple

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