

Rice, Soybean, and Finger Millet Milk-Incorporated Non-dairy Drinking Yoghurt Analogue with Desired Food Quality Attributes

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The development of non-dairy food products has been a growing trend as functional food to respond to the problems of cow's milk allergy, lactose intolerance, hypercholesterolemia and vegetarianism. During this study, a plant-based drinking yoghurt analogue was developed using rice (*Oryza sativa*) "Suwandal" with a milky taste and exquisite aroma, finger millet (*Eleusine coracana*) with high fibre, and soybean (*Glycine max*) with high protein with improved sensory characteristics. Each milk substitute was prepared by a wet grinding process with optimized water: bean/grain ratio (1:1). The sensory evaluation with 30 untrained panelists selected 25% soy milk: 25% rice milk: 25% finger millet milk ratio, 5% (w/v) sucrose, 2% (w/v) glucose, 3% (w/v) sago starch, 10% (v/v) pineapple pulp as the best formulation. Non-dairy yoghurt analogue was fermented with *Streptococcus thermophilus* and *Lactobacillus delbrueckii* sub sp. *Bulgaricus*. The proximate composition results indicate crude protein (12.03%), crude fat (0.11%), moisture (78.49%), crude ash (0.33%), crude fibre (1.30), and nitrogen-free carbohydrate (7.74%). As functional properties, total phenolic content (5.83 mg (GAE)/g) and DPPH scavenging activity (33.24 mg/mL) were analyzed. The physicochemical and microbial properties were evaluated for a storage period of 21 days. The initial day values revealed the pH (4.56), titratable acidity (0.51% of lactic acid), total soluble solid (13%), viscosity (19.52 mPa.s) and water holding capacity (64.68%). Furthermore, the viability of *Lactobacillus* remained above 10⁶ CFU/mL up to 14 days and after 14 days, yeast and mould count exceeded the safe level (10² CFU/mL). A shelf life study revealed that the product can be stored up to 14 days at 4 °C with desired food quality. In summary, the prepared cereal and legume blended novel non-dairy yoghurt analogue is a potential candidate to be used as a protein-rich, functional, non-dairy yoghurt analogue to consumers looking for dairy alternatives.

Keywords: Finger millet milk, Non-dairy, Rice milk, Soy milk, Yoghurt