

Development of Nutritionally Enriched Gluten Free Food Products and Synbiotics from Fagopyrum Esculentum: A Review

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ABSTRACT

Introduction: A substantial proportion of individuals across the globe have coeliac disease, IgE-mediated allergy, or non-coeliac gluten sensitivity. Fagopyrum esculentum has garnered scientists' attention for its balanced amino acid composition and mineral content, functional phytonutrient profile along with the pseudocereal's compatibility with diverse processing methods, and its probiotic and prebiotic characteristics. Thus, the mounting need for plant-based, lactose- and gluten-free, gut-friendly alternatives rendered Fagopyrum esculentum appropriate for this research to develop nutritionally dense synbiotic functional food products.

Aim: This study aimed to develop and optimise recipes by adapting technological processes and enhancing them with prebiotics and probiotics, intended to produce a synbiotic functional food products with buckwheat as the primary ingredient constituent.

Materials and Methods: The study encompasses four phases of processing of Fagopyrum esculentum to remove antinutritional components, resurrection of probiotic culture, enumeration, and

co-culturing of synergistic strains. Next, prebiotic formulations produced from ayurvedic bio-actives were employed for cultivating microorganisms consequently led to the development and standardisation of variants followed by samples' organoleptic assessment employing a 9-point Hedonic scale thereafter statistical analysis using MAHP and TOPSIS methods and top-ranked products' nutritional, physicochemical, microbiological, and antioxidant profiles were investigated.

Results: The mean of all the product samples varied significantly at $p < 0.01$ confidence level with F values 13.31, 9.47, 14.18 and 10.93 of products (Jelly, Chocolate, Granola bar, Thandai, respectively). The attributes colour and texture/consistency of all the product samples varied significantly at $p < 0.001$ confidence level.

Conclusion: The developed products resolve lacunae in functional bovine milk and gluten-free space by not only offering nutritious vegan appetising alternatives, but also possess therapeutic properties.

Keywords: Coeliac, Lactose-free, Buckwheat, Synbiotic

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