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Development of Tiger Nut Milk as Substitute to Soymilk: Physicochemical and Sensory Characteristics

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Structured Abstract

Background: The growing demand for plant-based milk substitutes has highlighted the limitations of soymilk, including soy allergies and concerns over genetically modified soybeans. Soymilk, while popular for its cost and nutritional value, presents challenges for individuals with soy allergies and raises health concerns due to the presence of antinutritional factors like trypsin inhibitors and phytic acid. This study explores tiger nut milk as a potential alternative to soymilk, leveraging the nutritional benefits of tiger nuts (*Cyperus esculentus L.*), which are rich in dietary fibre, healthy fats, vitamins, and minerals, and are naturally hypoallergenic.

Methods: The physicochemical properties and sensory characteristics of tiger nut milk and soymilk were rigorously compared. Key parameters such as moisture content, ash, fibre, fat, colour, pH, and viscosity were analysed using standard laboratory techniques. Moisture and ash content were determined by oven-drying and muffle furnace methods, respectively, while fibre and fat contents were assessed using Soxhlet extraction and chemical digestion techniques. Colour and pH were measured with a chroma meter and pH meter, respectively. Sensory evaluations were conducted with attributes like appearance, colour, odour, sweetness, texture, and overall acceptability using a 9-point hedonic scale.

Results: Tiger nut milk showed significantly higher fibre content (8.20%) than soymilk (3.39%), suggesting better digestive health benefits. Soymilk had a higher ash content (6.17%), indicating more minerals. Tiger nut milk had slightly lower moisture content (93.61%) compared to soymilk (94.70%), which may affect texture and shelf life. Tiger nut milk had higher fat content compared to soymilk. Colour analysis revealed that tiger nut milk had a darker hue, and viscosity measurements indicated that tiger nut milk was more viscous and had a thicker texture. Sensory tests showed that tiger nut milk was well-received, with high overall acceptability, similar to soymilk.

Conclusion: In conclusion, the findings suggest that tiger nut milk is a viable substitute for soymilk, offering comparable sensory qualities and enhanced nutritional benefits, particularly for individuals with soy allergies. This study supports the potential of tiger nut milk to diversify plant-based milk options and contribute to sustainable dietary practices, promoting healthier and more inclusive nutrition alternatives.

Keywords: Tiger nut milk, Soymilk substitute, Plant-based milk, Soy allergies, Hypoallergenic milk

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