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Turning rice waste into opportunity: Circular economy approaches for food waste reduction
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Abstract
Food waste presents a significant challenge, highlighting the need for sustainable solutions within a circular economy framework. This study examines the potential of upcycling post-consumer rice waste into high-value rice crackers, analyses customer preferences, and assesses the costs and benefits of these products. In an experimental framework, a Face-Centered Central Composite Design was used to optimise and validate a three-phase process. Under optimal treatment conditions, the produced crackers are crisp and safe to consume. The consumer survey revealed a high level of acceptance and preference for the circular economy model. The cost-benefit analysis indicated economic viability, with higher net gains compared to conventional crackers. This study addresses gaps in rice waste management and illustrates the potential for utilising post-consumer waste to mitigate food waste, thereby contributing to the Sustainable Development Goals. Recommendations for policy and directions for future research are presented to improve food security and sustainability. © 2025 The Authors

Author Keywords
Circular economy; Food waste management; Rice waste; Sustainability; Treatment

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