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

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Central Composite Design was used to optimise and validate a threephase 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 costbenefit 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.

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