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I-CReST 2025:079-083 – High-Energy Ball Milling of Pineapple Pomace: The Finer, the Better?

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ABSTRACT

The agro-industrial processing of pineapple generates substantial amounts of pomace waste, which remains largely underutilized despite its rich fibrous and bioactive compounds. This study explores the conversion of pineapple pomace into functional powder via high-energy ball milling, aligning with circular economy principles and waste valorization strategies. The milled powders were characterized for morphological changes using scanning electron microscopy (SEM), while colour attributes were evaluated using a colorimeter. Hydration properties were also assessed to determine the suitability for food and material applications. Results revealed that prolonged milling significantly reduced particle size, improved surface homogeneity, and modified colour characteristics. While finer particles influenced hydration behaviour due to structural alterations, optimizing milling duration was found to be essential for achieving a functional balance tailored to specific applications. This work demonstrates the potential of ball-milled pineapple pomace as a sustainable, value-added biomaterial for food or material applications.

Keywords: Pineapple pomace; Waste; Milling; Powder