Review

Food Waste Biorefinery: Sustainable Strategy for Circular Bioeconomy

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PII: S0960-8524(17)31292-0
DOI: http://dx.doi.org/10.1016/j.biortech.2017.07.176
Reference: BITE 18596

To appear in: *Bioresource Technology*

Received Date: 18 May 2017
Revised Date: 28 July 2017
Accepted Date: 29 July 2017

Please cite this article as: Dahiya, S., Kumar, A.N., Chatterjee, J.S.S., Sarkar, O., Mohan, S.V., Food Waste Biorefinery: Sustainable Strategy for Circular Bioeconomy, *Bioresource Technology* (2017), doi: http://dx.doi.org/10.1016/j.biortech.2017.07.176

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Abstract

Enormous quantity of food waste (FW) is becoming a global concern. To address this persistent problem, sustainable intervention with green technologies is essential. FW can be used as potential feedstock in biological processes for the generation of various biobased products along with its remediation. Enabling bioprocesses like acidogenesis, fermentation, methanogenesis, solventogenesis, photosynthesis, oleaginous process, bio-electrogenesis, etc., that yields various products like biofuels, platform chemicals, bioelectricity, biomaterial, biofertilizers, animal feed, etc can be utilized for FW valorisation. In order to economise these bioprocesses, a biorefinery strategy needs to be adapted for the utilization of residual organic waste towards diverse product recovery. The present review highlights various enabling bioprocesses that can be employed for the generation of energy and various commodity chemicals in an integrated approach addressing sustainability. The waste biorefinery approach for FW needs optimization of the cascade of the individual bioprocesses for the transformation of linear economy to circular economy.

Keywords: Food waste; Valorisation; Bioenergy; Biobased products; Biorefinery