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A holistic approach for food waste management towards zero-solid disposal and energy/resource recovery

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Abstract

This study developed a holistic approach which was based on the ultra-fast hydrolysis of food waste with the fungal mash rich in various hydrolytic enzymes produced in situ from food waste as well. After the 8-h hydrolytic treatment, the solid residue and liquor were separated. It was found that the produced solid residue can meet all the requirements for biofertilizer in terms of NPK and heavy metal contents, while the separated liquor with high soluble organics concentration was further subject to anaerobic digestion for enhanced biomethane production. The results showed that 0.41 kg of biofertilizer with a moisture content of 76.9% and 54.4 L of biomethane could be produced from 1 kg of food waste. As such, it is expected that this study may lead to the paradigm shift in food waste management with the ultimate target of zero-solid discharge.

Keywords: Food waste, Fungal mash, Anaerobic digestion, Fertilizer, Zero-solid disposal.

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