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Valorizing Biohydrogen, Volatile fatty acids and Biohythane

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**Pre-aeration of food waste to augment acidogenic process at higher organic load:
Valorizing Biohydrogen, Volatile fatty acids and Biohythane**

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Abstract

Application of pre-aeration (AS) to waste prior to feeding was evaluated on acidogenic process in a semi-pilot scale biosystem for the production of biobased products (biohydrogen, volatile fatty acids (VFA) and biohythane) from food waste. Oxygen assisted in pre-hydrolysis of waste along with the suppression of methanogenic activity which enhanced acidogenic product formation. AS operation resulted in 9.07% improvement in HCE and 10% more VFA production than the control. Increasing organic load (OL) improved the productivity. AS, also influenced concentration and composition of fatty acid. Highest fraction of acetic (5.3 g/l), butyric (0.7 g/l) and propionic acid (0.84 g/l) was achieved at higher OL (100 g COD/l) which positively influenced the degree of acidification (DOA). AS strategy showed positive influence on biofuel (Biohydrogen and biohythane) production along with the biosynthesis of short chain fatty acids functioning as a low-cost pretreatment strategy in a single stage bioprocess with simultaneous waste remediation.

Keywords: Biobased products, Bioethanol, Acetic acid, Propionic acid, Butyric acid.

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