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## Cardboard proportions and total solids contents as driving factors in dry co-fermentation of food waste

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### Abstract

This study evaluated the influence of the co-substrate proportions (0-60 % of cardboard in dry basis) and the initial total solid contents (20-40 %) on the batch fermentation performance. Maximum hydrogen yields were obtained when mono-fermenting food waste at high solids contents (89 ml H<sub>2</sub>·gVS<sup>-1</sup>). The hydrogen yields were lower when increasing the proportions of cardboard. The lower hydrogen yields at higher proportions of cardboard were translated into higher yields of caproic acid (up to 70.1 gCOD·kgCOD<sub>bio</sub><sup>-1</sup>), produced by consumption of acetic acid and hydrogen. The highest substrate conversions were achieved at low proportions of cardboard, indicating a stabilization effect due to higher buffering capacities in co-fermentation. *Clostridiales* were predominant in all operational conditions. This study opens up new possibilities for using the cardboard proportions for controlling the production of high added-value products in dry co-fermentation of food waste.

### Keywords

Biohydrogen; Biorefinery; High solids; Dark fermentation; Mixed culture

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