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Impact of temperature and substrate concentration on degradation rates of acetate, propionate and hydrogen and their links to microbial community structure

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**Abstract:** The present study investigates the conversion of acetate, propionate and hydrogen consumption linked to the microbial community structure and related to temperature and substrate concentration. Biogas reactors were continuously fed with coffee powder (20 g-COD/L) or acetate (20, 40, and 60 g-COD/L) and operated for 193 days at 37 °C or 55 °C conditions. Starting HRT was 23 days which was then reduced to 7 days. The kinetics of acetate and propionate degradation and hydrogen consumption rates were measured in batch assays. At HRT 7 days, the degradation rate of propionate was higher in thermophilic batches, while acetate degradation rate was higher at mesophilic conditions. The gaseous hydrogen consumption in acetate reactors increased proportionally with temperature and substrate concentration, while the dissolved hydrogen was not affected. The relative high abundance of hydrogenotrophic methanogens

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