

The effects of pH and initial glucose concentration on carbon material and energy balances in hydrogen-producing *Clostridium tyrobutyricum* JM1

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A carbon metabolism of newly-isolated *Clostridium tyrobutyricum* JM1 was investigated at varying pHs and initial glucose concentrations. Because an understanding of metabolic regulations was required to provide guidance for further effective metabolic design or optimization, in this case, maximizing hydrogen production, carbon material and energy balances by *C. tyrobutyricum* JM1 were determined and applied in anaerobic glucose metabolism. The overall carbon distribution suggested that pHs and initial glucose concentrations had strong influence on the stoichiometric coefficients of products and the molar production of ATP on the formation of biomass. *C. tyrobutyricum* JM1 had a high capacity for hydrogen production at pH 6.3 and initial glucose concentration of 222.4 mM with high concentrations of acetate and butyrate.