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BOOK OF ABSTRACTS

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Influence of Salt Content, Degree of Proteolysis and Aeration on the Production of a Polymer via Fermentation of Whey-related Media by *Rahnella aquatilis*

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Utilization of whey as fermentation feedstock has been attempted widely by the dairy industry. Production of lactan, a polysaccharide composed of mannose, galactose and galacturonic acid (at the molar ratio 5:3:2), starting from a semi-defined medium containing lactose via fermentation under aerobic conditions with *Rahnella aquatilis* was described previously. In this communication, the effect of salt, previous hydrolysis and aeration were studied during the polysaccharide production from whey in alternative fermentation media: hydrolyzed whey (under (i) aerobic and (ii) anaerobic conditions), hydrolyzed whey with 2.0% NaCl (w/v) (iii) and 0.5% NaCl (w/v) (iv), and plain whey (v).

The growth of biomass and the variation in concentration of organic acids, lactose, peptides and free amino acids were monitored. The polysaccharide production and the variation of viscosity of were also followed throughout 48 h of fermentation. Under the different conditions tested, *Rahnella aquatilis* showed a maximum specific growth rate of 0.61 h⁻¹, 0.60 h⁻¹, 0.61 h⁻¹, 0.64 h⁻¹, and 0.46 h⁻¹ for hydrolyzed whey under aerobiosis and under anaerobiosis, hydrolyzed whey with 2.0% NaCl (w/v) and 0.5% NaCl, and plain whey, respectively; the final yields of the various organic acids were: 0.07, 0.18, 0.07, 0.04 and 0.05 (g/g_{lactose}) for acetic acid; 0.06, 0.07, 0.00, 0.04 and 0.02 (g/g_{lactose}) for lactic acid; 0.08, 0.09, 0.03, 0.04 and 0.04 (g/g_{lactose}) for formic acid; 0.01, 0.04, 0.01, 0.01 and 0.02 (g/g_{lactose}) for succinic acid; and 0.11, 0.09, 0.14, 0.19 and 0.00 (g/g_{lactose}) for acetoin. Lactose was almost completely depleted during the 48 h of fermentation for hydrolyzed whey; however, lactose was only partly consumed in plain whey (final yield of 0.48 g/g_{lactose}). Small peptides (< 2,000 Da) and most free amino acids were consumed by 24 h in hydrolyzed whey fermented under anaerobiosis and plain whey, but these peptides were present until the end of fermentation in the remaining media. *R. aquatilis* showed similar behavior in free amino acid consumption in hydrolyzed whey with NaCl and hydrolyzed whey fermented under aerobiosis. Plain whey yielded very low concentrations of free amino acids throughout the whole fermentation. The yield of polysaccharide was 0.56, 0.26, 0.39, 0.40 and 0.44 g/g_{lactose} for hydrolyzed whey fermented under aerobiosis and under anaerobiosis, hydrolyzed whey with 2.0% NaCl (w/v) and 0.5% NaCl, and plain whey, respectively.