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Sugar beet hydrolisates as a carbon source for LAB

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The cost of raw materials is one of key factors that determine the economic viability of fermentation processes. Pure glucose, sucrose, starch, etc. are expensive feedstocks for lactic acid production. The choice of substrate is usually a question of geographic availability. An abundant but underexploited residue in Poland is sugar beet pulp, which remains after sucrose extraction. Its qualities include a very low lignin level (around 2% of dry matter) and high carbohydrate content (75% w/w of dry matter), including pectin (24–32%), cellulose (22–30%) and hemicellulose (22–30%). Its principal components can be converted into hexose and pentose feedstocks for use in various fermentation processes. Three collection strains (PCM, Wrocław, Poland) were used in the study: *Lactococcus lactis* 2379, *Lactobacillus acidophilus* 2510 and *Lactobacillus delbrueckii* 490, as well as the environmental isolate (from sugar beet pulp) *Lactobacillus plantarum* II. Aerobic cultivation of lactic acid bacteria was conducted at 37°C for 48 hours. The growth of bacteria was measured via spectrophotometric (optical density measurements) and plate count methods. Lactic acid production, the monosaccharide profile of sugar beet hydrolisates and sugar utilization profiles were measured by spectrophotometry using Assay Kits (Megazyme). All of the strains tested reached the stationary growth phase after around 30 hours of cultivation. However, the sugar utilization profiles and acidification dynamics were found to be strain-dependent. In our study, complete consumption of glucose and fructose and partial utilization of galactose (*Lactobacillus* strains) and arabinose (*Lb. delbrueckii* and *plantarum*) was observed with all four strains.

Biography

Marta Dudkiewicz has graduated from Lodz University of Technology (LUT) with BSc in Technical Microbiology and MSc in Fermentation Technology. The subject of her MSc thesis, which she completed in 2014 was "The utilization of sugar beet pulp hydrolysate for lactic acid fermentation". Currently, she is employed by Institute of Fermentation Technology and Microbiology (LUT), working as a scientist and researcher and doing research for Applied Research Programme – Project PBS1/B8/3/2012. She is a co-author of several articles which are going to be published soon.

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