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IMPROVING THE NUTRITIONAL QUALITY OF FODDER YEASTS BY ADDING MINERALS

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Abstract

The aim of this study was the diversification of fodder yeast assortments with viable economic effects while reducing the pollution to the environment by capitalisation of wastewaters with high monosaccharides content from pulp and paper industry. As inoculum, in the bioreactor, a mixture of two species of yeasts *Candida utilis* and *Candida arborea* (1:1 ratio) was used at 38°C, pH 5.5 and an air flow of 0.02 L/h was insured. Wastewaters from technological process of pulping of softwood with NaHSO₃, having a content of 59 g/L fermentable monosaccharides, as a main carbon source, were used. In order to obtain a biofort with a higher mineral content, the necessary quantities of iron, zinc and manganese salts of the fabrication recipe have been optimized by Response Surface Methodology according to an experimental program based on a mathematical model with protein, biomass and ash percentage as response functions. The optimized values were: 1.2 mg/L zinc sulphate, 1.0 mg/L manganese sulphate and 0.8 mg/L ferrous sulphate. In these conditions the final product had 55.86% protein content, 6.03 g/L biomass and 3.92% ash, w/w. The target minerals content in 3.72% ash (w/w) were: 0.09% Mn²⁺, 0.2% Zn²⁺, and 0.3% Fe²⁺. Analysis of variance (ANOVA) test confirmed the accuracy of the developed models.

Key words: *Candida arborea*, *Candida utilis*, fodder yeast, mathematical optimization, wastewater

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