TITLE: CELL VIABILITY OPTIMIZATION OF *Lactobacillus reuteri* DSM 17938 IN FERMENTED COCONUT MILK BASED DRINK

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ABSTRACT:

The probiotic microorganism *Lactobacillus reuteri* can improve the intestinal microbial balance and produce beneficial effects to the individuals' health, when consumed in adequate doses on a daily basis. Fermented products available on the market are often restricted to milk matrices, so the consumption of vegetable milks is a viable alternative for individuals who do not appreciate or have a restriction on the consumption of these foods. Coconut milk consists of a liquid extracted from the mature coconut (*Cocos nucifera* L.) endosperm and can be mixed with water for consumption as a beverage. The objective of the study was to verify the influence of coconut pulp concentration and temperature on cell production and acidity after fermentation by *Lactobacillus reuteri* DSM 17938, using a central factorial centered design ($\alpha = \pm 1$). The effect of the variables: fermentation temperature (31 - 43 °C) and coconut pulp concentration (1:9 - 1:3 (w/v)) were analyzed by multiple regression and the polynomial model was developed to obtain optimal conditions for *L. reuteri* culture after 15 hours of fermentation. Cellular production was expressed in log CFU/mL and titratable acidity in % of total acidity. The initial inoculum was 6.51 log CFU/mL and the pH was set at 6.0 ± 0.2 for all fermentations. The generated model was significant ($p<0.05$) and the multiple regression analysis was done in the experimental data to develop the polynomial model of second order, that had a coefficient of determination $R^2 = 0.91$. The prediction of the best conditions based on the model obtained for *L. reuteri* fermentation was at 34 °C and concentration 1:3 (m /v) of coconut pulp, generating an estimated growth of 9.13 log CFU/mL for the product. The final production of 2.1% of total acidity is necessary for maintaining the fermentation characteristics and microbiological stability of the fermented product. The results showed that the coconut milk substrate provides nutrients for the fermentation of *L. reuteri* without the need for supplementation and therefore, new products can be developed from this matrix in substitution to fermented milk.

Keywords: beverage; *Cocos nucifera* L., probiotic, response surface

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