

NISIN OBTENTION BY *LACTOCOCCUS LACTIS* USING DILUTED SKIMMED MILK IN BATCH CULTURES

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Nisin is produced by *Lactococcus lactis* and exhibits a broad spectrum of antibacterial activity against Gram-positive bacteria and their spores. For these reasons, this peptide has been applied in food conservation systems mostly as natural food biopreservatives in order to provide microbiologically stable foods. However, its cost remains high. Then, it is important to reduce production costs to stimulate its commercialization. The objective of the present study was to optimize large-scale production of this biomolecule in diluted skimmed milk aiming to diminish production costs. *Lactococcus lactis* subsp. *lactis* ATCC 11454 precultures were grown in 150mL MRS broth for 36h at 30°C. The inoculum was poured into 1500 mL of diluted skimmed milk at 25% of standard concentration (2.27g total solids) in 2L bioreactor (New Brunswick Scientific), at 30°C for 52 hours. The operated conditions were, 100 and 200 rpm of agitation, and 0.5 L. min⁻¹ air flow and without air injection. Nisin activity was quantified by agar diffusion assay, utilizing *Lactobacillus sakei* ATCC 15521 as sensitive indicator microorganism. Highest and lowest nisin activity was detected in conditions with 0.5 L.min⁻¹ air injection, after 16h (8.38x10³ AU.mL⁻¹) and 20h (1.04x10³ AU.mL⁻¹), 100 and 200 rpm, respectively. Incubations without air injection reached the best nisin activity after 36h (2.0x10³ AU.mL⁻¹) and 12h (2.88x10³ AU.mL⁻¹), 100 and 200rpm, respectively. Results showed that the time length of fermentative process can be reduced to 16 hours. From the viewpoint of its industrial importance, the diluted skimmed milk can be utilized as a less expensive substrate for nisin expression from cells.