INVESTIGATION OF NISIN PRODUCTION FROM LACTOCOCCUS LACTIS UTILIZING DILUTED SKIMMED MILK AS INEXPENSIVE CULTURE MEDIA

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**Background:** There is an extensive background of earlier works done to optimize nisin expression in *Lactococcus lactis*, and many of them have described commercial media as MRS and M17 broth for optimal cellular growth and nisin production. Since this peptide molecule has wide applications and is a high value-added good.\(^1\)\(^2\)

**Objectives:** This work shows the utilization of a low-cost growth media: diluted skimmed milk, for nisin production through fermentative process in bioreactor by *L. lactis* ATCC 11454.

**Methods:** *L. lactis* was assayed in a 2L bioreactor with 1.5L of diluted skimmed milk (2.27% total solids) with initial pH 6.8. The experimental conditions were:

i. air flow rate 0.5L.min\(^{-1}\) (30°C/100rpm/56h) and

ii. air flow rate 1.0L.min\(^{-1}\) (30°C/200rpm/56h), at uncontrolled pH.

Activity of released nisin in culture media was quantified by the agar diffusion assay, using *L. sakei* ATCC 15521 as a sensitive indicator microorganism and expressed in arbitrary units (AU.mL\(^{-1}\) of medium).

**Results:** The best results for diluted skimmed milk were detected after 16 hours (8.38x10\(^3\)AU.mL\(^{-1}\)) and 24 hours (1.12x10\(^3\)AU.mL\(^{-1}\)) of fermentation. It showed that the lowest condition of aeration and agitation improved nisin expression.

**Conclusion:** The utilization of diluted skimmed milk as cultivation media is an important factor to reduce the production costs of this important molecule.

**References:**
