

TITLE: PRODUCTION OF *B. atrophaeus* ATCC 9372 SPORES USING WHEY AS AN ALTERNATIVE MEDIA

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ABSTRACT

Approximately 85% of the milk used to make cheese results in whey, a by-product rich in nutrients as lactose, proteins, lipids and mineral salts. In Brazil, 40% of whey generated by the dairy industry is disposed off as effluent without previous treatment, being a pollutant that impacts in environment. *Bacillus atrophaeus* spores are widely used as biological indicators for sterilization processes and are also well known as a system that express active biomolecules. Therefore, studies that can optimize *Bacillus* spores development and reduce whey's waste impact on environment should be regarded more carefully. The objective of this work is to evaluate the use of whey as a cultivation medium to obtain spores of *Bacillus atrophaeus*, as a way to better make use of its nutrients contributing to reduction of pollutants. A matrix suspension was made using a 10 mL aliquot of *Bacillus atrophaeus* ATCC 9372 spores suspension that was thermally activated at 80°C for 10 minutes, transferred to Roux flask containing 200 mL of Plate Count Agar (PCA) and incubated at 37°C for 6 days. The industrial whey was diluted into reverse osmosis water to performed media with 66%, 50% and 25% of whey, being pH values of 4.88, pH 5.06 and pH 5.03, respectively, besides a 100% of whey (pH 5.01) and sterilized at 121°C for 20 minutes. A 100 mL volume of each media was transferred to Erlenmeyer flask, inoculated with 0.1g/L of *Bacillus* biomass and incubated at 37°C /100 rpm for 6 days. All cultivation conditions presented viable spores, which final concentration ranged from 8.70×10^6 spores / mL to 1.80×10^7 spores / mL, for concentrations of 25% of whey (pH 8.84 (± 0.07) and 0.089 (± 0.003) mOsm / kg) and 100% of whey (pH 9.01 (± 0.01) and 0.300 (± 0.001) mOsm / kg), correspondingly. Results demonstrated that whey can be used to grow and sporulate *Bacillus atrophaeus* cells, proposing the reuse of a processing waste to obtain products of pharmaceutical and industrial interest.

Keywords: *Bacillus atrophaeus* spores, reuse, whey

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