

**TITLE:** USE OF AGRO-INDUSTRIAL RESIDUES FOR BACTERIAL BIOMASS PRODUCTION

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**Abstracts:**

The use of agro-industrial residues as raw materials for new products has been an alternative to policies of disposal management since the waste of these residues may represent loss of nutrients and biomass and its use proves to be an efficient tool against the loss of organic sources of carbohydrates. In recent years, the São Francisco valley has become a major producer of wines and other fermented beverages. Besides the high production it originates large quantities of residues, mainly grape and malt. This study aimed to evaluate the use of agro-industrial residues for bacterial biomass production. The byproducts used were from companies and institutions located in the city of Petrolina – PE. The *Bacillus subtilis* strain FO 5.5 was used in the work of fermentation process and it belongs to the culture collection of the Laboratory of Biotecnologia Microbiana (LBM), UNEB, Juazeiro, Brazil. The microorganism pre-inoculum was prepared using a solution containing peptone, glucose and sodium chloride used at constant agitation (160 rpm) for 14 hours. The raw materials were processed by autoclaving water at 120°C for 10 minutes. The 80 ml broth was prepared from 400 g of residue diluted in 1000 ml of distilled and sterilized water in sterile flasks in a environment previously sterile. The 10% of the inoculum was added to the broth and the flasks was maintained at constant agitation (160 rpm) at 37°C for 24 hours. The samples were collected in seven different times: one in time 0, five in every 2 hours, and the last one after 24 hours. The bacterial biomass production was obtained from measuring optical density (DO) at 600 nm. The tests were carried out in triplicate and the values analyzed using Student's T tests, analysis of variance (ANOVA) in BioEstat software. The strain of *B. Subtilis* was well-developed in the two fermentations used with no significant differences between the residues and the control containing standard medium. However, the fermentation with malt obtained higher values of DO between time 0 and 1 compared to the fermentation with the grape, rising from 0.979 to 2.052. In the other times tested, the production remained significantly constant in both residues analyzed. The dry biomass was higher in both fermentations (values between 0.09 and 0.1g) compared to the control (0.01g).

**Keywords:** fermentation, *Bacillus subtilis*, inoculum, residues.

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