Journal of Bioscience and Bioengineering
Volume 128, Issue 3, September 2019, Pages 296-301

High-energy ball milling treatment of soybean for *Bacillus thuringiensis* culture media

Ana Karin Navarro-Mtz [1], Rigoberto Martinez-Garcia [2], Michell Urzua-Valenzuela [3], Crisanto Roldan-Sabino [2], Mykola Kakazey [4], Erick Adrian Juarez-Arellano [5]

https://doi.org/10.1016/j.jbiosc.2019.02.010

Soybean meal has been intensively used as a substrate in culture media for several microorganisms. However, the fermentable sugar containing the soybean needs to be released from the solid matrix through different processes. Against this backdrop, the present study explores the use of high-energy ball milling as a one-step treatment method for expedited production of fermentable sugars of textured soybean. The best result is observed after only 5 min of milling, obtaining 34.1 times more fermentable sugars than untreated textured soybean, and 2.5 times more than commercially used soybean meal. Notably, the textured soybean ball-milled has been used as a substrate for Bacillus thuringiensis var. *kurstaki* HD-73 fermentation. The cell and spore production is also compared with a standard Rowe media. The maximum cell concentration obtained in the entire fermentation process using ball-milled textured soybean media is found to be higher than the concentration obtained using the standard Rowe media. In addition, it is observed that there is a direct correlation between maximum cell production and reducing sugar concentration generated by the high-energy ball milling treatment. No fermentation inhibitors or by-products are generated during the physical treatment.