

Use of Agro-Industrial Residue Wheat Bran to Induce Phytase Production by *Aspergillus japonicus* in Air-lift Bioreactor and pH Growth Influence

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Phosphorus is stored as phytic acid in vegetables and it can be used as phosphorus source by animals after phytase action. So, it has high biotechnological potential as animal ration additive. In industrial production, the fermentation scale, carbon source and pH growth have crucial importance in the levels and cost of enzyme production. The aim of this work was to verify the scale of phytase production using wheat bran as carbon source and also verify the pH growth influence on the production profiles. The microorganism was incubated in flasks containing 25, 50, 100 and 500 mL of modified Czapeck medium, supplied with 1 % wheat bran, at 30 °C, 100 rpm for 96 h and in air-lift bioreactor with 6 L (0.1 vvm air-supply). The phytase activity was measured according to modified Yin et al. (2007), using phytic acid dodecasodium as substrate. An enzymatic unit was defined as the amount of μmols of phosphorus released by mL in the assay conditions. The protein was measured according to Bradford (1976), using BSA as standard. *A. japonicus* showed high enzymatic production when the culture volume was increased from 25 mL (flasks) to 6000 mL (bioreactor). Moreover, the phytase showed high activity at pHs 3.5, 6.0 and 7.5. After standardizing the pHs of activity, fermentations using the same pHs were performed to verify if there were alterations on the production profile. The results showed several alterations in the studied pHs. At the cultivation pHs 3.5 and 6.0 the best activity was observed at pH 7.5, and for the cultivation pH 7.5 the best activity was 6.0. Thus, it was concluded that wheat bran as carbon source has high biotechnological potential to industrially produce phytases in air-lift bioreactor, and that there is no direct relation between values of pH cultivation and pH activity.

Keywords: agro-industrial residue; phytases; *Aspergillus japonicus*; air-lift bioreactor; growth pH.

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