

Autolysis of rice bran phytate in long-term study on batch fermentor

ABSTRACT

Microorganisms especially bacteria produce a diverse of phytate-degrading enzymes. Rice bran is excellent media for bacterial growth and enzymes secretion. The aim of the study was autolysis of rice bran phytate (6%) in long-term on batch fermentor (with constant agitator speed (300 rpm) and fixed air flow rate (0.5kg/cm²)). The phytase production in the fermentor was with gradual color change from initial light green to dense green during the fermentation processes. The pH and temperature changes during production of phytase in the rice bran media over 10 weeks were observed. Initial 3 weeks, a reduction in pH from pH 6 to pH 4.2. After the middle of 4thweek and 5thweek considerable increase in pH towards the neutral range was observed i.e. from pH 6.2 to pH 6.99. In the 5thand6thweeks the pH range was found to be pH 7 to pH 7.9. Starting from the beginning of 8thweek to 10thweek pH was in the near alkaline range pH 8-pH 8.2. The temperature of the media during the initial stages of fermentation for first 3 weeks was 22-25°C. Increase in temperature was noticed after the end of the third week. The remaining weeks from 3 to 10 the temperature range was 25°C-29°C. The temperature of the media inside the fermentor was in between 22°C and 29°C throughout the study (environment temperature 20-40°C). Enzymatic partitional hydrolyzed of rice bran phytate into lower myoinositolphosphates will have many health benefits applications.

Keyword: Autolysis; Fermentation; Phytate-degrading enzymes; Rice bran