

Preliminary Studies on the Production of Baker's Yeast Cell Mass

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This research work was a preliminary approach to analyze the possibility of increasing the baker's yeast (*S. cerevisiae*) production and evaluating the appropriate conditions to increase baker's yeast cell mass production. Initially, *S. cerevisiae* was grown at 30 °C and pH 5.0, in a fermentation medium containing sucrose, with varying concentrations of (gL⁻¹) 10, 20, 30, 40 and 50, along with yeast extract (2.5gL⁻¹), bacteriological peptone (1.15gL⁻¹), (NH₄)HPO₄ (0.25gL⁻¹) and MgSO₄.7H₂O (0.025gL⁻¹) at 300rpm (YPS medium). The maximum cell mass yields (dry weight) obtained were (gL⁻¹); 2.42, 2.75, 4.22, 4.24 and 4.43 respectively. The best sugar concentration for yeast cell mass production was 50gL⁻¹. To improve the oxygen supply of the medium, the media were either, mixed in a shaker (at 100rpm), mixed using an impeller (at 100rpm) or aerated (at 100bubbles/min) and the maximum dry weight of *S. cerevisiae* cells obtained were, 4.16, 4.04 and 5.52gL⁻¹ respectively. Aeration was selected for further studies. Volumetric scaling up with different medium volume: flask volume ratio of, 1:2 was maintained in 1, 2, 3, and 5L flasks, and the highest cell mass (dry weight) obtained were, 4.78, 5.13, 4.82 and 4.53gL⁻¹ respectively. Thus highest cell mass was obtained in the 2L flask containing 1L medium and it was selected as suitable condition for further studies. When the aeration rates were changed from 100, 150, and 200bubbles/min, the highest cell mass (dry weight) of 5.41gL⁻¹ was obtained at the aeration rate of 200bubbles/min.