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KEY WORD: YEAST / BIOMASS / PRODUCTION / FAT / WASTE-WATER

NOPPADOL BENCHAPATTARAPONG : PRODUCTION OF YEAST BIOMASS FROM FAT-CONTAINING WASTE-WATER. THESIS ADVISOR : ASSO.PROF. SONGSRI KULPREECHA, Ph.D. 170 pp. ISBN 974-637-159-2

Production of yeast biomass from waste-water containing fat for animal feed supplement and simultaneously as a remedy of such waste-water, was studied. Analysis of the waste-water shows that it contains 3.27 g/l of fat and has a moderately high level of 558 mg/l of BOD and 941 mg/l of COD in average. Seven yeast strains namely C 5045, C 5046, S 0001, T 0001, Y 8662, N 0001 and N 0002 were all capable of growing in this waste-water. Cultivations of all strains in the following three media, waste-water, waste-water plus either glycerol or glucose, were performed. It was found that Y 8662 could grow better than other strains in the first two media and reached about 2.58 g/l and 8.40 g/l maximum cell dry-weight, respectively. In waste-water containing glucose medium, S 0001 was the best to grow and gave a maximum cell dry-weight of 4.63 g/l. Cell compositions such as the cellular protein, amino acids and vitamin contents of yeast Y 8662, were appropriately determined and compared with other strains and other types of animal feed supplement. Consequently, 90.7% decrease in level of BOD and 88.3% in level of COD were observed after a 48-hours-cultivation. This greatly improved the quality of waste-water and put it in the range of standard value to be discharged to environment. In shake flask, from a cultivation in waste-water medium supplemented with 10 g/l  $(\text{NH}_4)_2\text{SO}_4$  and 1 g/l yeast extract using 15 h seed culture under the optimal conditions, 6.48 g/l maximum cell dry-weight,  $0.125 \text{ h}^{-1}$  of specific growth rate and 0.322 g/l/h. of biomass productivity were obtained. Optimum condition determined in this study for biomass production in a fermenter using Y 8662 were as follows ; Temperature  $30^\circ\text{C}$ , pH 5.0, agitation speed 600 rpm. and aeration rate 1 vvm. In a batch fermentation, 8.61 g/l of maximum cell dry-weight,  $0.138 \text{ h}^{-1}$  of specific growth rate and 0.438 g/l/h. of biomass productivity were achieved while all the fat content was used up within 42 h. The result also showed decreases in levels of BOD and COD to 97.9% and 94.2% respectively after 72 h. cultivation. In a continuous cultivation of Y 8662, the maximum biomass productivity observed at the dilution rate of  $0.218 \text{ h}^{-1}$  that gave about 10.07 g/l cell dry-weight, was up to 3.20 g/l/h. Efficiency of Y 8662 in term of biomass production appeared to be highest in the continuous fermentation followed by batch fermentation and shake flask culture respectively.

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