

## CALCIUM ALGINATE ENTRAPPED LACTOBACILLUS CASEI FOR CONTINUOUS LACTIC ACID PRODUCTION

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When *Lactobacillus casei* was grown in nutrient medium (medium contained  $\text{g l}^{-1}$  ; glucose 150; yeast extract, 10;  $\text{K}_2\text{HPO}_4$ , 0.5;  $\text{KH}_2\text{PO}_4$ , 0.5 and sodium citrate, 1.0 and salt solution 1.0 ml; salt solution contained  $\text{g l}^{-1}$  ;  $\text{MgSO}_4\cdot\text{H}_2\text{O}$ , 50.0;  $\text{MnSO}_4\cdot\text{H}_2\text{O}$ , 3.1;  $\text{FeSO}_4\cdot 7\text{H}_2\text{O}$ , 2.0 and ascorbic acid 5.0) at  $42^\circ\text{C}$  and pH 6.5, maximum lactic acid ( $140.2 \text{ g l}^{-1}$ ) was produced at 38 h. Cells harvested in log phase (18 h) were entrapped in calcium alginate ( $10 \text{ g l}^{-1}$ ). When the beads were packed in a thermostated ( $42^\circ\text{C}$ ) column ( $20 \times 2 \text{ cm}$ ), optimum flow for maximum lactic acid yield (74%) was  $18 \text{ ml h}^{-1}$ . At this flow rate productivity obtained was  $21.2 \text{ g l}^{-1}$ . With increase in the flow rate, viable cells in the beads were decreased. However cell number was more than that present initially. When different concentrations of glucose in the range of 50 to  $250 \text{ g l}^{-1}$  was passed at  $18 \text{ ml h}^{-1}$ , maximum lactic acid yield (81.6%) was obtained at the glucose concentration of  $125 \text{ g l}^{-1}$ . With an increase in glucose concentration from 50 to  $100 \text{ g l}^{-1}$ , viable cells in the beads were increased and further increase in glucose concentration in the feed decreased the viable cell number in the beads. When the nutrient medium containing  $125 \text{ g l}^{-1}$  glucose was passed continuously, steady state was observed after 3 days and continued for 17 days.

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