

Hyper-Production of Lysine through Fermentation and Its Biological Evaluation on Broiler Chicks

Authors : Shagufta Gulraiz, Abu Saeed Hashmi, Muhammad Mohsin Javed

Abstract : Lysine required for poultry feed is imported in Pakistan to fulfil the desired dietary needs. Present study was designed to produce maximum lysine by utilizing cheap sources to save the foreign exchange. To achieve the goal of lysine production through fermentation, large scale production of lysine was carried out in 7.5 L stirred glass vessel fermenter with wild and mutant *Brevibacterium flavum* (B. flavum) using all pre-optimized conditions. The identification of produced lysine was carried out by TLC and amino acid analyzer. Toxicity evaluation of produced lysine was performed before feeding to broiler chicks. During biological trial concentrated fermented broth having 8% lysine was used in poultry rations as a source of Lysine for test birds. Fermenter scale studies showed that the maximum lysine (20.8 g/L) was produced at 250 rpm, 1.5 vvm aeration, 6.0% inoculum under controlled pH conditions after 56 h of fermentation with wild culture but mutant (BFENU2) gave maximum yield of lysine 36.3 g/L under optimized condition after 48 h. Amino acid profiling showed 1.826% Lysine in fermented broth by wild B. flavum and 2.644% by mutant strain (BFENU2). Toxicity evaluation report showed that the produced lysine is safe for consumption by broilers. Biological evaluation results showed that produced lysine was equally good as commercial lysine in terms of weight gain, feed intake and feed conversion ratio. A cheap and practical bioprocess of Lysine production was concluded, that can be exploited commercially in Pakistan to save foreign exchange.

Keywords : lysine, fermentation, broiler chicks, biological evaluation

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