Statistical optimization of the induction of the induction of phytase production by Arabinose in a recombinant E. coli using response surface methodology

ABSTRACT

The production of phytase in a recombinant E.coli using the pBAD expression system was optimized using response surface methodology with full-factorial faced centered central composite design. The ampicilin and arabinose concentration in the cultivation media and the incubation temperature were optimized in order to maximize phytase production using 23 central composite experimental design. With this design the number of actual experiment performed could be reduced while allowing eludidation of possible interactions among these factors. The most significant parameter was shown to be the linear and quadratic effect of the incubation temperature. Optimal conditions for phytase production were determined to be 100 µg/ml ampicilin, 0.2 % arabinose and an incubation temperature of 37ºC. The production of phytase in the recombinant E. coli was scaled up to 100 ml and 1000 ml.

Keyword: Recombinant phytase; Statistical optimization; Cultivation conditions.