

Optimal conditions for hepatitis B core antigen production in shaken flask fermentation

ABSTRACT

The effects of various environmental factors such as pH (5, 6, 7, 8 and 9), temperature (30, 37 and 40°C) and rotational speed (150, 200 and 250 rpm) on the growth and the hepatitis B core antigen (HBcAg) production of *Escherichia coli* W3110IQ were examined in the present study. The highest growth rate is achieved at PH 7, 37°C and at a rotational speed of 250 rpm which is 0.927 h⁻¹. The effect of pH on cell growth is more substantial compared to other parameters; it recorded a 123% different between the highest growth rate (0.927 h⁻¹) at pH 7 and lowest growth at pH 5. The highest protein yield is achieved at pH 9, rotational speed of 250 rpm and 40°C. The yield of protein at pH 7 is 154% higher compared to the lowest yield achieved at pH 5. There is about 28% different of the protein yield for the *E. coli* cultivated at 250 rpm compared to that at 150 rpm which has the lowest HBcAg yield. The yield of protein at 40°C is 38% higher compared to the lowest yield achieved, at 30°C.

Keyword: *E. coli*; Fermentation; HBcAg; pH; Rotational speed; Temperature