

# Optimasi produksi lisat streptococcus macedonicus mbf10-2 dalam medium de man, rogose, dan sharpe mrs vegetone dengan response surface methodology = Optimization of lysate production of streptococcus macedonicus mbf 10 2 in vegetone de man rogose and sharpe mrs medium using response surface methodology

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## Abstrak

Lisat sel telah menarik perhatian untuk dijadikan bahan baku sediaan kesehatan karena struktur kimia jelas, parameter dosis aman, umur simpan lama, dan konten dari berbagai sinyal molekuler. Lisat sel dapat diperoleh dari Streptococcus macedonicus MBF 10-2 yang ditumbuhkan dalam medium de Man Rogosa dan Sharpe MRS Vegetone. Streptococcus macedonicus dipilih karena terbukti menghasilkan asam laktat yang bersifat sebagai pelembab, antimikroba dan meremajakan kulit, eksopolisakarida, peptida antimikroba macedocin dan macedovicin, komponen intraselular bersifat antioksidan, enzim dan asam organik. Kultur sel dioptimasi lama fermentasi dan komposisi mediumnya untuk memperoleh produksi lisat yang ideal. Rancangan percobaan menggunakan Rancangan Komposit Pusat CCD dengan Response Surface Methodology RSM software Design Expert 7.0.0 dengan tiga faktor: dekstrosa 1 ; 1,5 ; 2 ; 2,5 ; dan 3, proteose pepton vegetable 0,5 ; 0,75 ; 1 , 1,25 dan 1,5 serta lama fermentasi 15; 17; 19; 21 dan 23 jam. Analisis yang dilakukan: aktivitas Bacteriocin-Like Inhibitor Substance BLIS lisat sel dan pH lisat sel. Hasil perhitungan untuk respon aktivitas BLIS mengikuti persamaan model kuadratik dengan  $R^2=74,60$  dan untuk respon pH lisat juga mengikuti persamaan model kuadratik dengan  $R^2=78,73$ . Kondisi optimum produksi lisat menunjukkan konsentrasi dekstrosa optimal sebesar 2,5, proteose pepton vegetable optimal sebesar 1,25, lama fermentasi 17 jam dengan konsentrasi starter 10 dan nilai OD600nm 0,2 0,05.

Cell lysate has drawn attention to be raw material healthcare because of its clear chemical structure, safety dose parameters, long shelf life and the content of various signaling molecules. Cell lysate can be obtained from Streptococcus macedonicus MBF 10 2 in de Man Rogosa and Sharpe MRS Vegetone medium. Streptococcus macedonicus was chosen because has been proven to produce compounds such as lactic acid that has moisturizing, antimicrobial and rejuvenating effects on the skin, exopolysaccharide, antimicrobial peptide macedocin and macedovicin , antioxidant compounds, enzyme, and organic acid. Fermentation duration and medium composition of cell culture was optimized to obtain ideal cell lysate production. Central Composite Design CCD was used as Response Surface Methodology RSM Design Expert 7.0.0 obtained from software with three factors dextrose 1 1,5 2 2,5 and 3, proteose peptone vegetable 0,5 0,75 1 , 1,25 and 1,5 and fermentation process duration 15 17 19 21 and 23 hours. Analysis parameter was Bacteriocin Like Inhibitor Substance BLIS activity analysis and pH of cell lysate. The result of calculation showed BLIS activity response had quadratic model with  $R^2 74,60$  and pH lysate response also had quadratic with  $R^2 78,73$ . The optimum condition for lysate production shows optimal dextrose concentration 2,5 with optimal proteose peptone vegetable 1,25 , while optimal fermentation process duration was 17 hours with starter concentration was 10 and value OD600nm 0,2 0,05.