

# The effect of added agents on hyaluronic acid production by *Streptococcus equi* subsp. *zooeidemicus* HAWU

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## ABSTRACT

Hyaluronic acid (HA) is a high molecular-weight polymer with repeating units of D-glucuronic acid and N-acetylglucosamine that are bound by alternating -1,3 and -1,4 bonds. Because of its special biocompatibility and moisture-holding function. It has been used as biomedical, cosmetic industry and else relevance field. Commercially, HA is produced through extraction from rooster combs or by microbial fermentation, but problems with this material include the likelihood of it being contaminated by viruses. The main aim of the research was to determine the effect of added agents on hyaluronic acid production by *streptococcus equi* subsp. *zooeidemicus* HAWU. The description of this divided in to third sections. The first section is focused on the effect of added agents (lactic acid, Soya beans extract, H<sub>2</sub>O<sub>2</sub>) on the production of HA by *S. equi* subsp. *zooeidemicus* HAWU. in the flask and 5-L jar fermentor. In the flask, the optimal temperature was 37 °C, which led to highest HA production (4.58 g/L). In a 5-L jar fermentor, we achieved maximum HA productivity (1.0 g/h/L) when the added agents. The second section is focused on the empirical kinetic model for the batch production of HA from *S. equi* subsp. *zooeidemicus* HAWU. By using Monod and Michaelis-Menten models, it was found that substrate inhibition for HA production when H<sub>2</sub>O<sub>2</sub> was greater than 1 μmol/g/L. Moreover, a model involved with *S. equi* subsp. *zooeidemicus* HAWU growth, and HA accumulation combined non-growth-associated and growth-associated contributions, and consumption of glucose on the logistic and Luedeking-Piret equation was developed. The results predicted by the model were good agreement with the experimental observations. The third section is focused on the potential applications of HA as humectant was also study in this research and, the results show that HA has high moisture-absorption and moisture-retention capacities.

Keywords : *Streptococcus equi* subsp. *zooeidemicus* HAWU、Hyaluronic acid、Fermentation kinetics、Moisture-absorption、Moisture-retention

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