Production of Highly-Concentrated Lactic Acid From Date Juice *via* Fed-Batch Fermentation of *Lactobacillus rhamnosus*

천승우, Minsung Choi, Saeed M. Al-Zahrani[1], 이상엽*
KAIST; [1]King Saud University
(leesy@kaist.ac.kr*)

Arabic date, a biomass which is excessively overproduced and wasted in Arabic countries such as Saudi Arabia and Iraq, is mainly composed of sugars (70-80 wt%). In this study, fed-batch fermentation process by a kinetic model was developed for the efficient production of lactic acid at a high concentration using Arabic date juice. EXCEL was used to develop a kinetic model of *Lactobacillus rhamnosus* growth in batch fermentation, and the parameters for the model was obtained. Several fed-batch fermentations were conducted under fedding strategies such as pulsed feeding, exponential feeding, or modified exponential feeding to complete the model. This new model was then used to perform feed-forward controlled fed-batch fermentation, which resulted in the production of 171.79 g/L of lactic acid with the productivity and yield of 1.58 g/L/h[This work was supported by the Technology Development Program to Solve Climate Changes on Systems Metabolic Engineering for Biorefineries from the Ministry of Science, ICT and Future Planning through the National Research Foundation of Korea (NRF-2012M1A2A2026556). Further support by King Saud University is appreciated.].