

*Saccharomyces cerevisiae* commonly known as brewers or baker's yeast is widely used in the food or beverage industry. One difficulty of producing yeast with high yield is that ethanol starts to produce in certain situation which causes high loss due to that ethanol can be substrate for yeast but is toxic which reduces the yield of yeast. This phenomenon is the so-called Crabtree effect. Understanding cellular regulation of metabolism is a major challenge in systems biology. Recent results show that the regulation is not controlled via enzyme levels only, but by non-obvious combinations of hierarchical (enzyme and gene levels) and metabolic (allosteric interaction and mass action) regulation. To understand the regulation which might causes the Crabtree effect, the feasibility analysis is applied which is an extension of metabolic flux analysis. For feasibility analysis, the feasible enzyme space is created which means the analysis deals with the possible enzyme level. The model used in this work includes the metabolic flux balances and the reaction kinetics. The investigation starts from the linear unconstrained optimization to the nonlinear constrained optimization with different scenarios which describe the possible situations the cell might be in. As a result, some regulation of the metabolism in different scenarios and the regulation which might lead to the Crabtree effect are interpreted.