

Thesis Title	Improving productivity of <i>Spirulina</i> production by adjusting light exposure frequency
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### Abstract

This research, improvement of *Spirulina platensis* productivity by adjusting light exposure frequency was studied. The research was based on these previous results, a cell could increase light utilization efficiency when existing in flashing light condition and cell growth rate could be increased by increasing light exposure frequency. This research was divided into 3 parts. The first part, the effect of mixing which alters the light exposure of cells was studied mathematically. The results showed that productivity increased from non-mixing system to mixing system and the level of light exposure frequency up to 2 Hz affected significantly on productivity. The second part was to confirm our mathematical procedure in the first part, productivity between laboratory and calculation was compared. The results showed that the difference of productivity between two methods was about 7%. Finally, we used mathematical procedure, which was referred to the first part, to propose an appropriate condition in mass algal cultivation in the present system (rate of vertical mixing is 3 cm/sec) and to propose a strategy for *Spirulina platensis* productivity improvement. The results showed that in the present system (rate of vertical mixing is 3 cm/sec) optimal initial OD<sub>560</sub> was up to the depth of system, i.e. optimal initial OD<sub>560</sub> was 0.2, 0.065 and 0.04 at 5-cm, 15-cm and 25-cm depth, respectively. And if we increase frequency of light exposure almost 2 Hz., productivity could be improved at least 12% (at 15-cm depth). However, in this

research, factors which might affect on productivity reduction such as photoinhibition, photorespiration were neglected. So the proposed result in the second part might be adjusted when applying to commercial scale.

Keywords : *Spirulina platensis* / light exposure frequency