

Optimisation of Virgin Coconut Oil Extraction of Natural Pigment from Microalgae by Response Surface Methodology (RSM)

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The present study reports on the extraction of natural pigment from three different species of microalgae (*Arthrospira platensis*, *Nannochloropsis oculata*, and *Thalassiosira* sp). Response surface methodology (RSM) was used to investigate the effect of process variables on the extraction using virgin coconut oil (VCO). Two independent variables, temperature (50–60 °C) and extraction time (60–120 minutes), were investigated. According to the results, the optimal extraction condition with VCO were microalgae specific. For *Arthrospira platensis* and *Thalassiosira* sp, the ideal conditions were achieved at a temperature of 60 °C and an extraction period of 90 minutes; whereas, for *Nannochloropsis oculata*, the optimal conditions were achieved at a temperature of 59.83 °C for 88.09 minutes. The experimental results under ideal conditions were in good consistency with the predicted values, which showed that the extraction of pigments from microalgae using VCO will enhance the functionality of VCO itself and will be adaptable into products for functional foods.

Keywords: Virgin coconut oils, Microalgae, Carotenoids, Chlorophylls, RSM