

ENCAPSULATION OF CANDLENUT OIL TO PREVENT OXIDATION

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STATEMENT BY THE AUTHOR

I hereby declare that this submission is my own work and to the best of my knowledge, it contains no material previously published or written by another person, nor material which to a substantial extent has been accepted for the award of any other degree or diploma at any educational institution, except where due acknowledgement is made in the thesis.

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ABSTRACT

CANDLENUT OIL ENCAPSULATION TO PREVENT OXIDATION

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The aim of this research is to protect the omega-3, omega-6, and omega-6 PUFAs in candlenut oil through microencapsulation by spray-drying method. Cold expeller press machine was used for the candlenut oil extraction to maintain the omega fatty acids content. Four wall materials used were HPMC, Alginate, β -cyclodextrin, and gum arabic with the wall materials to oil ratio were 3:2, 1:1, and 2:3 respectively for the microencapsulation. Initially, viscosity of the microencapsulated candlenut oil emulsion was measured. Then, the emulsions were spray-dried to obtain the microencapsulated candlenut oil powder. Moisture content, wettability, microencapsulation efficiency (ME), and peroxide value (PV) for analysis were evaluated as the powder parameters. The data obtained showed that microencapsulation through spray-drying process was successful in protecting the candlenut oil against oxidation. Higher wall materials concentrations lead to higher viscosity and higher ME, except for alginate formulation with 3:2 ratio (A1). Thus, in terms of ME, β -cyclodextrin formulation with 3:2 ratio (C1) showed the best performance with 80.98%, while in terms of peroxide values, gum arabic formulation with 3:2 ratio (G1) showed the best performance with 0.69 meq/kg.

Keywords: Candlenut oil, Microencapsulation, HPMC, Alginate, β -cyclodextrin, gum arabic.



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DEDICATION

I dedicate this work to God almighty for which I will not be here without, my family, friends, and my lecturers, who have helped me through thick and thin. I would also like to dedicate my future self, who I trust will grow to be a successful and strong person.



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