

INTISARI

Penelitian ini bertujuan untuk mengetahui pengaruh fotooksidasi selama penyimpanan terhadap karakteristik mikrokapsul karotenoid dari *Spirulina platensis* yang dienkapsulasi dengan enkapsulan gum arab dan konsentrat protein *whey*. Rasio gum arab dan konsentrat protein *whey* yang digunakan yaitu 2:1. Tahapan penelitian ini meliputi ekstraksi karotenoid *Spirulina platensis*, pembuatan fraksi minyak dan fraksi air dengan perbandingan 1:9, pembuatan emulsi, proses *spray drying*, dan penyimpanan dengan fotooksidasi selama 5 hari. Penelitian ini menggunakan Rancangan Acak Lengkap dengan dua faktor yaitu jenis sampel (ekstrak dan mikrokapsul) dan kondisi penyimpanan (gelap dan terang). Parameter yang diamati meliputi kadar air, aktivitas air, karotenoid total, karotenoid permukaan, retensi karotenoid, efisiensi enkapsulasi, kelarutan bubuk, warna, ukuran partikel, dan morfologi partikel. Hasil penelitian menunjukkan bahwa kombinasi jenis sampel dan kondisi penyimpanan mempengaruhi stabilitas karotenoid selama fotooksidasi. Perlakuan mikroenkapsulasi dapat mempertahankan stabilitas karotenoid selama fotooksidasi dibanding dengan ekstrak tanpa enkapsulasi, dengan penurunan karotenoid total masing-masing sebesar 39% dan 65,02%. Stabilitas tertinggi karotenoid *Spirulina platensis* setelah dipengaruhi fotooksidasi yaitu mikrokapsul karotenoid yang disimpan pada botol gelap dengan penurunan karotenoid total, efisiensi, dan retensi masing-masing sebesar 39%; 32,32%; dan 39%, sedangkan stabilitas terendah karotenoid *Spirulina platensis* yaitu sampel ekstrak karotenoid yang disimpan pada botol terang dengan penurunan parameter karotenoid total sebesar 65,02%.

Kata kunci : fotooksidasi, mikrokapsul karotenoid, *Spirulina platensis*, gum arab, konsentrat protein *whey*

ABSTRACT

This research aims to determine the effect of photooxidation during storage to the characteristics of the carotenoid microcapsules of *Spirulina platensis* encapsulated with gum arabic and whey protein concentrate. The ratio of gum arabic and whey protein concentrate was 2:1. The steps of this research included the extraction of carotenoids *Spirulina platensis*, the preparation of oil and water fraction with the ratio was 1:9, the preparation of emulsion, spray drying process, and photooxidation storage for 5 days. This research used a completely randomized design with two factors namely sample types (extract and microcapsules) and storage conditions (dark and bright). Parameters observed included water content, water activity, total carotenoids, carotenoid surface, retention of carotenoid, encapsulation efficiency, powder solubility, colour, particle size, and particle morphology. The results showed that the combinations of sample types and storage conditions affected the stability of carotenoids during photooxidation storage. Microencapsulated treatments can maintain carotenoid stability during photooxidation storage compared with extracts without encapsulation with a total carotenoid reduction of 39% and 65.02% respectively. Once *Spirulina platensis* was affected by photooxidation storage, the highest stability of carotenoid was obtained by microcapsules stored in the dark bottles which the decreasing of total carotenoids, encapsulation efficiency, and retention of carotenoid each at 39%; 32,32%; and 39% respectively, meanwhile the lowest stability of carotenoid *Spirulina platensis* was the sample of carotenoid extracts stored on a bright bottle with the decreasing of total carotenoids was 65,02%.

Keywords : carotenoid microencapsulated, gum arabic, photooxidation, *Spirulina platensis*, whey protein concentrate.