

Intisari

Tujuan penelitian ini adalah mengetahui karakteristik mikrokapsul karotenoid *Spirulina platensis* yang dienkapsulasi dengan sodium kaseinat dan gum arab serta mendapatkan produk mikrokapsul yang memiliki retensi dan efisiensi enkapsulasi yang tinggi. Mikroenkapsulasi terdiri dari fraksi air dan fraksi minyak (10:1). Kombinasi konsentrasi ekstrak karotenoid yang digunakan yakni 0,09%, 0,18%, 0,27%, 0,36% dan 0,45% dari volume total (b/v). Pembuatan fraksi air dilakukan dengan melarutkan bahan enkapsulan yang terdiri dari gum arab dan sodium kaseinat (2:1) dalam 100 ml akuades. Pembuatan fraksi minyak dilakukan dengan melarutkan ekstrak karotenoid sesuai dengan kombinasi perlakuan dalam 10 ml *Virgin Coconut Oil* (VCO). Fraksi air dan fraksi minyak kemudian dicampur menggunakan *homogenizer* dengan kecepatan 24.000 rpm selama 1 menit. Emulsi dikeringkan menggunakan *spray dryer*. Penelitian ini dilakukan dengan Rancangan Acak Lengkap dengan 3 ulangan. Variabel yang diukur adalah rendemen, kadar air, aktivitas air, karotenoid total, karotenoid permukaan, efisiensi enkapsulasi, retensi karotenoid, kelarutan, warna, ukuran partikel dan morfologi partikel. Konsentrasi ekstrak karotenoid berpengaruh nyata ($p < 0,05$) terhadap karotenoid total, karotenoid permukaan, efisiensi enkapsulasi, dan retensi karotenoid. Perlakuan terbaik adalah kombinasi ekstrak karotenoid sebesar 0,45% dengan nilai rendemen 12,30%, kadar air 4,57, aktivitas air 0,33, karotenoid total 3,42 $\mu\text{g}/\text{mg}$, karotenoid permukaan 5,11 $\mu\text{g}/\text{mg}$, efisiensi enkapsulasi 33,21%, retensi karotenoid 13,02%, kelarutan 77,2% dan ukuran partikel 1,778 μm .

Kata kunci : gum arab, karotenoid, mikroenkapsulasi, sodium kaseinat, *Spirulina platensis*

Abstract

The purposes of this study were to determine the effect of *Spirulina platensis* carotenoid concentration to characteristic of microcapsules with arabic gum and sodium caseinate as encapsulating materials and got a carotenoid microcapsules which had high retention and efficiency. Microcapsules were obtained by water and oil fractions (10:1). Concentration of carotenoid extract were 0.09%, 0.18%, 0.27%, 0.36% and 0.45% of the total volume (w/v). Water fractions were prepared by dissolving arabic gum : sodium caseinate (2:1) as encapsulating materials, up to total volume of 100 ml. Oil fractions were obtained by dissolving carotenoid extracts into Virgin Coconut Oil (VCO) up to volume of 10 ml. The oil and water fractions were homogenized with high speed homogenizer of 24,000 rpm for 1 minute. The emulsion was dried using spray dryer. This research was conducted by Completely Randomized Design in three replications. The microcapsules were measured on yield, moisture content, water activity, total carotenoids, surface carotenoids, encapsulating efficiency, carotenoids retention, solubility, color, particle size and particle morphology. The carotenoid extract concentration had the significant effect ($p < 0.05$) to total carotenoids, surface carotenoids, encapsulating efficiency, and carotenoids retention. The best treatment was at the concentration of 0,45%. It had 12.30% yield, 4.57% moisture content, 0.33 water activity, 3.42 ug / mg total carotenoids, 5.11 ug / mg surface carotenoids, 33.21% encapsulating efficiency, 13.02% carotenoids retention, 77.2% solubility and 1.788 μm particle size.

Keywords: arabic gum, carotenoid, microencapsulation, sodium caseinate, *Spirulina platensis*