

PEMBUATAN SUPLEMEN PRO-VITAMIN A DALAM BENTUK NANOEMULSI DARI EKSTRAK WORTEL DAN *VIRGIN COCONUT OIL*

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INTISARI

Pembuatan suplemen pro-vitamin A dalam bentuk nanoemulsi dari ekstrak wortel dan *virgin coconut oil* telah dilaksanakan. Tujuan penelitian ini adalah pembuatan ekstrak wortel-VCO bebas alkohol dilakukan dengan metode maserasi dan teknik *one-pot*, penentuan perbandingan berat antara fase minyak (ekstrak wortel-VCO), fase air, surfaktan, dan HLB yang tepat untuk mendapatkan suplemen pro-vitamin A dalam bentuk nanoemulsi yang stabil menggunakan energi tinggi, dan mempelajari karakteristik suplemen pro-vitamin A dengan parameter meliputi β -karoten, ukuran droplet, pH, viskositas, turbiditas, mineral, dan stabilitas yang memiliki kandungan minimum konsumsi kebutuhan tubuh.

Suplemen pro-vitamin A dibuat menggunakan campuran dua surfaktan non ionik *food-grade* yaitu tween 80 dan span 80 dengan jumlah total penambahan sebanyak 1 % (b/v). Fase minyak yang digunakan berupa ekstrak wortel-VCO dan akuades sebagai fase air. Suplemen pro-vitamin A dibuat dengan energi tinggi. *Hydrophile-Lipophile Balance* (HLB) yang digunakan adalah 8,6 (formula A); 10,6 (formula B); dan 12,6 (formula C).

Hasil penelitian menunjukkan bahwa ekstrak wortel-VCO yang dihasilkan berbentuk cairan kental, berwarna jingga cerah, memiliki bau khas wortel, dan kandungan β -karoten sebesar 8573,97 μg . Suplemen pro-vitamin A yang dihasilkan merupakan jenis emulsi *Oil in Water* dan yang memiliki kestabilan tinggi terhadap sentrifugasi, pemanasan, maupun penyimpanan suhu ruang ditunjukkan pada formula C. Hasil karakterisasi diperoleh kandungan β -karoten sebesar 110,10 μg , ukuran droplet 26,52 nm, pH 7,02, viskositas 1,50 cP, turbiditas tanpa perlakuan, sentrifugasi, dan pemanasan berturut-turut 1,63; 3,22; 5,39 cm^{-1} serta kandungan mineral Zn, Ca, K dan Fe berturut-turut sebesar 0,32; 2,39; 0,51; 0,57 mg L^{-1} .

Kata kunci: HLB, nanoemulsi, pro-vitamin A, suplemen, VCO

PREPARATION OF PRO-VITAMIN A SUPPLEMENTS IN NANOEMULSION FORM FROM CARROT AND VIRGIN COCONUT OIL EXTRACT

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ABSTRACT

Preparation of pro-vitamin A supplements in nanoemulsion form from carrot and virgin coconut oil extract had been done. This research aimed to prepare the carrot-VCO extract without alcohol by maceration method and one-pot technique, determine the weight ratio between the oil phase (carrot-VCO extract), water phase, surfactant, and HLB with the exact value to get pro-vitamin A supplements in the form of stable nanoemulsions using high energy, and study the characteristics of pro-vitamin A supplements using parameters β -carotene, droplet size, pH, viscosity, turbidity, minerals, and stability which have a minimum content of consumption the human needs.

Pro-vitamin A supplements were made using the mixture of two food-grade non-ionic surfactants, tween 80 and span 80 with a total addition of 1 % (w/v). The oil phase used was carrot-VCO extract and aquadest as the water phase. Pro-vitamin A supplements were made with high energy. Hydrophile-Lipophile Balance (HLB) used was 8.6 (formula A); 10.6 (formula B); and 12.6 (formula C).

The results showed that the carrot-VCO extract produced was in the form of a thick liquid, bright orange in color, had a characteristic carrot odor, and the β -carotene was 8573.97 μg . The pro-vitamin A supplements produced that kind of *Oil in Water* emulsion and had a high stability of centrifugation, heating, and room temperature storage was shown in formula C. The characterization results obtained that β -carotene 110.10 μg , droplet size 26.52 nm, pH 7.02, viscosity 1.50 cP, turbidity without treatment, centrifugation, and heating were 1.63; 3.22; 5.39 cm^{-1} and the mineral content of Zn, Ca, K dan Fe is 0.32; 2.39; 0.51; 0.57 mg L^{-1} , respectively.

Key words: HLB, nanoemulsion, pro-vitamin A, supplements, VCO