OMEGA-3 EMULSION FROM RUBBER (*HEVEA BRASILIENSIS*) SEEDS

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ABSTRACT

The formulation of omega-3 emulsion from rubber (*Hevea Brasiliensis*) seed oil must be based on the best performance of the emulsion formation in varying the type and composition of emulsifier used. By choosing rubber seed that has been a beneficial waste as the main resource in producing emulsion for food purpose, people can get one of the important sources of omega-3 that normally is supplied by the fish oil. The difference of them are the absentees of ecosapetanoic acids (EPA) and docosahaxaneoic acids (DHA) in the rubber seed oil, but still it has a significant value of linolenic acids (LNA) about 19.22%. Type of the emulsion is determined according to the HLB value of emulsifier. Emulsifier with a low HLB value lead to the formation water-in-oil (W/O) emulsion and the oil-in-water (O/W) is in another way around. The dilution method with water and oil is used for confirmation. Preparation of rubber seed oil (RSO) involved knocking the kernel, peeling, cutting, drying the rubber seed and extraction of oil by soxhlet extraction. Then, RSO is being mixed with distilled water and emulsifier including agents by homogenizer. Non-ionic emulsifier such as lecithin and span 80 will be chosen to use in the formulation. The best ratio of emulsifier and type of emulsion are investigated to produce a stable emulsion based on small droplet size, colour of the emulsion, low moisture content, moderate viscosity and slightly acidic pH value. From the analysis conducted, the best formulation selected is E2 with 50% distilled water, 6% lecithin of the total oil and 47% rubber seed oil (RSO).
ABSTRAK

Formulasi emulsi omega-3 daripada minyak biji getah (Hevea Brasiliensis) adalah berdasarkan pembentukan emulsi yang stabil di mana beberapa jenis pengemulsi dan komposisi emulsi yang berbeza telah digunakan. Biji-biji getah daripada pokok getah yang terbuang boleh memberi manfaat kepada manusia kerana ia mengandungi omega-3 yang kebiasaannya boleh didapati daripada minyak ikan yang merupakan makanan tambahan untuk kepentingan tubuh badan. Namun begitu, biji getah tidak mengandungi ecosapentanoic (EPA) dan asid docosahaxaneoic (DHA) tetapi masih mempunyai nilai asid linolenik (LNA) yang tinggi sebanyak 19.22%. Jenis emulsi yang akan terhasil ditentukan oleh nilai HLB pada pengemulsi. Nilai rendah membawa kepada pembentukan air dalam minyak (W/O) dan sebaliknya untuk pembentukan minyak dalam air (O/W). Namun begitu, ia perlu dipastikan dengan menggunakan metod pencairan dengan air dan minyak. Penyediaan minyak buah getah (RSO) merangkumi pemecahan kulit biji getah, pengupasan, pemotongan, pengeringan biji getah, pengekstrakan minyak dengan menggunakan soxhlet dan yang terakhir transesterifikasi. Selepas itu, RSO dicampur bersama air suling dan pengemulsi. Pengemulsi bukan ionik seperti lesitin dan span 80 digunakan dalam penggubalan emulsi. Nisbah kepekatan bahan dan jenis pengemulsi terbaik dikaji untuk menghasilkan emulsi yang stabil yang mempunyai karakteristik seperti saiz titisan yang kecil, warna emulsi yang tertentu, kandungan lembapan yang rendah, kelikatan yang sederhana dan nilai pH yang sederhana rendah. Daripada analisis yang dijalankan, formulasi yang terbaik adalah formulasi E2 yang mengandungi 50% air suling, 6% lesitin daripada berat minyak dan 47% minyak buah getah (RSO).
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<td>C</td>
<td>Carbon</td>
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<td>CHD</td>
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<td>cP</td>
<td>Centipoise</td>
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<td>d</td>
<td>Diameter</td>
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<td>$f_w$</td>
<td>fraction of the dispersed phase</td>
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<td>g</td>
<td>Gram</td>
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<td>GLC</td>
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