

**UJI KINERJA DAN FORMULASI *FOAM-MAT DRYING* UNTUK
PERCEPATAN PRODUKSI BUBUK EKSTRAK DAUN KELOR
(*Moringa oleifera* Lam.)**

INTISARI

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Daun kelor merupakan salah satu jenis produk tanaman yang dapat tumbuh di wilayah tropis dan menjadi komoditi yang terkenal di masyarakat karena memiliki karakteristik kandungan gizinya. Tanaman kelor telah banyak digunakan dalam bidang pangan dan kesehatan karena kandungan nutrisi yang beragam dibagian daun. Ekstraksi daun kelor dilakukan dalam meningkatkan kandungan bioaktif yang terkandung di dalamnya, komponen yang terekstrak perlu dilindungi untuk melindungi komponen ekstraksi dari paparan suhu tinggi. *Foam-mat drying* adalah metode yang terkenal dengan mempercepat proses pengeringan dengan mencegah komponen di dalamnya terdegradasi. Penelitian bertujuan guna menganalisis parameter sifat fisik selama proses *foam-mat drying* berlangsung berupa profil karakter *foam* selama *foam-mat drying*, profil kadar air, penentuan nilai difusivitas efektif selama pengeringan, profil warna, dan analisis jumlah *foam*. Pada enkapsulasi dilakukan dengan bahan *foaming* berupa *arabic gum* (AG), *xanthan gum* (XG), dan *whey protein isolate* (WPI) dengan variasi konsentrasi WPI sebesar 10%, 20%, dan 30% yang dikeringkan dengan tambahan *zeolite* pada suhu 70°C, 80°C, dan 90°C selama 2 jam. Selama karakterisasi *foam* didapatkan nilai *foam expansion* (FE) 0,25-0,41; *foam overrun* (FO) 0,25-0,41463; *air fraction* (AF) 0,2-0, 0,29310; dan *foam density* (FD) 0,00560-0,00802. Pada proses pengeringan menghasilkan sampel dengan kadar air *wet basis* dan *dry basis* pada rentang 54,62-12,83% dan 120,39-14,73%; nilai difusivitas efektif $7,44 \times 10^{-9}$ - $6,76 \times 10^{-9} \text{ m}^2/\text{s}$.; laju pengeringan (k) $1,16 \times 10^{-2}$ - $3,28 \times 10^{-4} \text{ m/s}$.; SSE 0,036-0,002; RMSE 0,063-0,015; X^2 0,006-0,0004 dengan nilai warna *lightness* 70,26-52,51; *redness* (-3,52)-0,06; *yellowness* 115,22-95,88; dan jumlah *foam* dalam rentang 47-14.

Kata kunci : daun kelor, *foam-mat drying*, kinetika pengeringan, bahan *foaming*

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**PERFORMANCE TEST AND FORMULATION OF FOAM-MAT DRYING
FOR ACCELERATED POWDER PRODUCTION OF MORINGA LEAF
EXTRACTS (*Moringa oleifera* Lam.)**

ABSTRACT

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Moringa leaves are a type of plant product that can grow in tropical areas and become a well-known commodity in the community because of its nutritional properties. Moringa plants have been widely used in the field of food and health because of the diverse nutritional content in the leaves. Moringa leaf extraction is carried out to increase the bioactive content contained in it, the extracted components need to be protected to protect the extracted components from exposure to high temperatures. Foam mat drying is a well-known method that accelerates the drying process by preventing the components from degradation. The research aims to analyze the physical property parameters during the foam-mat drying process in the form of foam character profile during foam-mat drying, moisture content profile, determination of effective diffusivity value during drying, color profile, and analysis of foam amount. Encapsulation was carried out with foaming agents such as gum arabic (AG), xanthan gum (XG) and whey protein isolate (WPI) with variations in WPI concentration of 10%, 20% and 30% which were dried with additional zeolite at 70°C, 80°C and 90°C for 2 hours. During the foam characterization, the values of foam expansion (FE) 0.25-0.41, foam overrun (FO) 0.25-0.41463, air fraction (AF) 0.2-0, 0.29310, and foam density (FD) 0.00560-0.00802 were obtained. The drying process produced samples with wet and dry basis moisture contents in the range of 54.62-12.83% and 120.39-14.73%; effective diffusivity values of 7.44×10^{-9} - 6.76×10^{-9} m²/s. drying rate (k) 1.16×10^{-2} - 3.28×10^{-4} m/s.; SSE 0.036-0.002; RMSE 0.063-0.015; X² 0.006-0.0004; having color values of lightness 70.26-52.51; redness (-3.52)-0.06; yellowness 115.22-95.88; and with total foam range around 47-14.

Keywords : *moringa leaves, foam-mat drying, dryer kinetic, agent foaming*

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