كلية الزراعة
قسم الهندسة الزراعية

جامعة الفيوم

البحث الخامس

مشترك - منشور بمجلة دولية ((غير مستخلص من رسالة))

عنوان البحث:

Effect of different drying methods on kinetics, energy-economic analysis, and quality attributes of dried Panax-notoginseng

تأثير طرق التجفيف المختلفة على حركية التجفيف والتحليل الحرارى والاقتصادي والخصائص النوعية لجذور الجنسنج الصينى المجففة

Abstract:

The present research investigated two drying systems for Panax-notoginseng (PNG) root, namely the hybrid indirect solar-electric drying (HISED) and oven drying (OD) to reach the desired moisture level in 13–6 h and 16–9 h at drying temperatures ranging from 60 to 90°C, respectively. Increasing drying temperature increased the diffusivity of PNG slices. HISED revealed a specific energy consumption (*SEC*) of 1.75 $kWh{\cdot}kg^{-1}$ lower than 18.35 $kWh{\cdot}kg^{-1}$ using OD. Low thermal efficiency ranged from 12.18 % to 13.22 % and 11.87–15.26 %, respectively, for HISED and OD. The estimated payback period (*P*) of the HISED and OD is 0.05 and 0.17 years, respectively. The increase in the drying temperature from 60 to 90 °C increased the total color change (ΔE) of dried PNG and varied from 3.98 to 11.97 using HISED and 8.75–12.37 using OD. Similarly, with the increase in the drying temperature, the final shrinkage (*FS*) decreased from 78.4 % to 59.6 % and 76.8–54.3 % using HISED and OD, respectively. The SEM images proved the increase in drying rate by expanding the internal pores of the PNG root slices over the drying process when the drying temperature increased over drying time using HISED and OD. Better saponin contents were preserved using OD compared to HISED.

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