IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.301
Volume 3, Issue 1, August 2023

Effects of Solar Drying Process Parameters on the Quality of Edible Mushrooms: A Review

Amit Choudhary[1] and Dr. Munna Verma[2]
Research Scholar, department of Mechanical Engineering, Bhagwant University, Ajmer, Rajasthan, India[1]
Assistant Professor, Department of Mechanical Engineering, Bhagwant University, Ajmer, Rajasthan, India[2]
amitchoudhary1989@gmail.com

Abstract: *Edible mushrooms are highly valued for their nutritional and culinary benefits. It is commonly consumed worldwide because they are a potential non-animal source of vitamins. Drying is a widely used preservation method to extend their shelf life and retain their valuable properties. Solar dryers have the potential to revolutionize mushroom processing by providing a sustainable, cost-effective, and nutritionally rich solution. The drying process significantly impacts the quality attributes of mushrooms, such as texture, color, flavor, and nutritional content. The present research work provides a comprehensive review of the effects of drying process parameters for the drying of edible mushrooms in the case of various solar drying methods. Each method involves distinct process parameters, such as temperature, air velocity, relative humidity, and drying time. These parameters influence the drying rate, drying kinetics, and overall product quality. Several studies have shown that the choice of drying method and specific process parameters can greatly affect the final product quality.*

Keywords: Solar Drying; Process Parameter; Dried Mushroom; Solar energy

REFERENCES

[1]. G. Cardwell, J. F. Bornman, A. P. James, & L. J. Black, "A review of mushrooms as a potential source of dietary vitamin D" Nutrients, 10(10), 1498, 2018.
[2]. R. M. Chugh, P. Mittal, N. MP, T. Arora, T. Bhattacharya, H. Chopra, et al., "Fungal mushrooms: A natural compound with therapeutic applications" Frontiers in Pharmacology, 13, 2022.
[3]. G. Cardwell, J.F. Bornman, A.P. James, A. Daly, G. Dabos, P. Adorno, J. Jakobsen, E. Dunlop, L.J. Black, "Effect of household cooking on the retention of vitamin D2 and 25-hydroxyvitamin D2 in pulse UV-irradiated, air-dried button mushrooms (Agaricus bisporus)" Food Chemistry, 424, 136387, 2023.
[4]. A. ELkhadraoui, S. Kooli, I. Hamdi, A. Farhat, "Experimental investigation and economic evaluation of a new mixed-mode solar greenhouse dryer for drying of red pepper and grape. Renew" Energy, 77, 1–8, 2015.
[5]. M.A. Hossain, B.M.A.A. Amer, K. Gottschalk, "Hybrid solar dryer for quality dried tomato" Dry. Technol., 26, 1591–1601, 2008.
[6]. V. J. Jasinghe, C. O. Perera, & S. S. Sablini, "Kinetics of the conversion of ergosterol in edible mushrooms" Journal of Food Engineering, 79, 864–869, 2007.
[7]. A. Kamarulzaman, M. Hasanuzzaman, N.A. Rahim, "Global advancement of solar drying technologies and its future prospects: A review" 2021. https://doi.org/10.1016/j.solener.2021.04.056.
[8]. G. A. Martinez-Medina, M. L. Chavez-Gonzalez, D. K. Verma, L. A. Prado-Barragan, J. L. Martínez-Hernandez, A. C Flores-Gallegos, "Bio-funcional components in mushrooms, a health opportunity: Ergothionine and huitlacohe as recent trends" Jousssrnal of Functional Foods, 77, 104326, 2021.
[9]. A. Mezrhab, L. Elfarh, H. Naji, D, Lemonnier, "Computation of surface radiation and natural convection in a heated horticultural greenhouse" Appl. Energy, 87, 894–900, 2010.
[10]. K. Musembi, P.P. Tripathy, S.L. Shrivastava, "Heat transfer analysis during mixed-mode solar drying of potato cylinders incorporating shrinkage: Numerical simulation and experimental validation" Food Bioprod. Process, 109, 107–121, 2018.

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[11]. M.N. Musembi, K.S. Kiptoo, N. Yuichi, "Design and analysis of solar dryer for midlatitude region" Energy Procedia, 100, 98–110, 2016.

[12]. M. Mohanraj, "Performance of a solar-ambient hybrid source heat pump drier for copra drying under hot-humid weather conditions" Energy Sustain. Dev., 23, 165–169, 2014.

[13]. S. Mishra, S. Verma, S. Chowdhury, G. Dwivedi, "Analysis of recent developments in greenhouse dryer on various parameters- a review" Mater. Today Proc., 2020. https://doi.org/10.1016/j.matpr.2020.07.429.

[14]. J. Perez-Moreno, A. Guerin-Laguette, A.C. Rinaldi, F. Yu, A. Verbeken, F. Hernandez-Santiago, "Edible mycorrhizal fungi of the world: What is their role in forest sustainability, food security, biocultural conservation and climate change?" Plants, People, Planet, 3(5), 471–490, 2021.

[15]. T.S.S.B. Rao, S. Murugan, "Solar drying of medicinal herbs: A review" 2021. https://doi.org/10.1016/j.solener.2021.05.065.

[16]. S.V.V. Ramana, S. Iniyanb, Ranko Goic, "A review of solar drying technologies" 2012. https://doi:10.1016/j.rser.2012.01.007.

[17]. C. Schunko., X. Li., B. Klappoth., F. Lesi., V. Porcher., A. Porcuna-Ferrer ., V. Reyes-García., "Local communities' perceptions of wild edible plant and mushroom change: A systematic review" 2022. https://doi.org/10.1016/j.gfs.2021.100601.

[18]. T. Thanaraj, N.D.A. Dharmasena, U. Samarajeewa, "Original article Comparison of drying behaviour, quality and yield of copra processed in either a solar hybrid dryer on in an improved copra kiln" Int. J. Food Sci. Technol., 42, 125–132, 2007.

[19]. M. Verma, C. Loha , A.N. Sinha, P.K. Chatterjee, "Drying of biomass for utilising in co-firing with coal and its impact on environment – A review" Journal of Renewable and Sustainable Energy Reviews, 2016. http://dx.doi.org/10.1016/j.rser.2016.12.101