

INVESTIGATION OF LOW TEMPERATURE HEAT TREATMENT AND UV IRRADIATION OF DIFFERENT CULTIVATED MUSHROOMS

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Heat treatment of food at low temperatures for extended durations is a well-established technology in food production. The essence of the "sous vide" technique involves heat treating food in sealed, preferably vacuum-sealed, heat-resistant plastic bags at low temperatures for extended periods, sometimes up to 50-70 hours, significantly lower than traditional cooking temperatures. The sous vide method for preparing mushrooms is widely recognized for enhancing flavour and aroma profiles in ready meals. In this study, we explore the effects of heat treatment and UV irradiation on mushroom powders, focusing on their vitamin D and ergosterol content. Specifically, we investigate changes in the vitamin D and ergosterol content of mushrooms during sous vide processing as a result of heat treatment. Additionally, we develop UV irradiation techniques to enhance the vitamin D content of mushrooms. We establish suitable sample preparation methods and liquid chromatographic procedures for quantifying the vitamin D and ergosterol content of mushrooms. Our findings indicate that sous vide processing of mushrooms at temperatures of 70 °C or lower does not result in significant changes in their vitamin D and ergosterol content. However, at 105 °C, or baking temperatures, we observe a decrease or stagnation in ergosterol content alongside an increase in vitamin D content. Furthermore, we demonstrate that the vitamin D content of mushroom powders can be significantly augmented using UV-B or UV-C light sources. By optimizing the irradiation conditions, including UV source power and the quantity of irradiated mushrooms, we can maximize the vitamin D content of mushroom powders. Acknowledgement: This research was supported by grant 2020-1.1.2-PIACI-KFI-2020-00100 from the National Research, Development and Innovation Office, Hungary. Additional backing came from the Doctoral Student Scholarship Program of the Co-operative Doctoral Program of the Ministry of Innovation and Technology, funded by the National Research, Development and Innovation Fund (grant No. KDP-2023-C2298833 to J. Bajzát).