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ALTERNATIVE PRODUCTION OF MICROBIOLOGICALLY SAFE FOODSTUFF WITH HIGH NUTRITIONAL VALUE BY SC-CO_2 DRYING PROCESS

Sara Spilimbergo, Filippo Michelino, Giovanni Lorenzon, Matteo Tobia Vizzotto, Marta Toffoletto, Gabriele Poloniato, Alessandro Zambon, Marina De Bernanrd and Stefano Dall'Acquac

University of Padova, Italy

Introduction: The present work investigates the feasibility of an innovative mild drying process using CO_2 at supercritical state (SC-CO_2).The efficiency of the process was proven in terms of microbiological and enzymatic stability, micronutrients preservation, water activity and colour in the treated products. Moreover, the possibility of further processing the dried samples into powder was investigated, in order to produce innovative food ingredients and additives.

Materials & Methods: Experiments were carried out on different food products using a high-pressure cell at 10-14 MPa, different temperatures, never higher than 50°C, and drying times to establish the influence of each parameter on the final results. SC-CO_2-dried samples were evaluated in terms of (i) mesophilic bacteria, pathogens, yeast and molds inactivation through standard plate count, (ii) enzymatic content through spectroscopic techniques, (iii) carotenoid, anthocyanin, vitamin and flavonoid concentration through HPLC and GC-mass instrumentation, (iv) water activity and (v) total color difference through reflectance probe.

Results & Conclusion: The results demonstrated that SC-CO_2 drying was a promising green drying technology that combines drying and pasteurization in just one single step with a significant impact on both safety and costs.

Biography

Giovanni *Lorenzon* is a Chemical Engineer graduated in 2017 with a master thesis on environmental-friendly strategies for the exploitation of beer's industrial residues through anaerobic digestion and nanocellulose synthesis. Since then, he worked as a Research Fellow in the Department of Chemical Engineering of the University of Padua, under the supervision of Prof. Sara Spilimbergo and Prof. Andrea Santomaso. His main research focus regards the optimization of the supercritical-CO_2 drying process, its exploitation for powder production and the subsequent particle analysis by means of computer-based simulations.

giovanni.lorenzon@unipd.it