Ozone effect on some fruits and vegetables microbial contamination

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The use of ozone as a disinfectant agent has a potential application in the food industry, due to its powerful oxidising capacity. In 1997, ozone was decreted a Generally Recognised as Safe (GRAS) substance for use as a food and food processing disinfectant or sanitizer, as long as good manufacturing practices were provided. Fruits and vegetables are perishable foods and can be important sources of foodborne diseases, since they may be consumed uncooked or unprocessed. Preservation of their quality and safety usually involves technologies that prevent microbial growth. The objective of this work was to study the effect of ozone in aqueous solution on the safety of red bell peppers, strawberries and watercress, evaluated, respectively, by Listeria innocua, total mesophiles and total coliforms enumeration. A pilot plant ozone generator was used in experimental assays. Products were cut in small pieces and were emerged in ozonated water for 1, 2 and 3 minutes. Two different ozone concentrations were considered (0.25 and 2.00 ppm). Water washings for the same periods of time were carried out as control of the ozone treatments. Results showed that microbial reductions were similar to the ones obtained by water-washings. The ozone concentration effect was not significant as well as the time of treatment considered for the microorganisms/products studied. An exception was observed for mesophiles/strawberries for a 3 minutes ozone process. In this case, the ozone treatment was evident.

Lipase production by Yarrowia lipolytica under increased air pressure

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Lipases, triacylglycerol hydrolases, are generally produced by microorganisms from a lipidic carbon source (Gupta et al., 2004) and Yarrowia lipolytica was proposed as an alternative organism for lipase production (Pignede et al., 2000). In the present work, Yarrowia lipolytica was grown in a pressurized bioreactor in order to obtain a further insight on the influence of moderate total air pressure on yeast growth and lipase production. A stainless steel reactor was used were the variation of OTR with pressure could be modelled by the power function. Despite the OTR increase of 2.3-fold when the pressure varied from 4 bar up to 8 bar, no differences were observed in the cellular growth. An increase of the lipase activity at 8 bar of 5.5-fold and 2.3-fold was obtained compared with the experiments under atmospheric pressure and 4 bar, respectively. The rise of the total air pressure from 1 bar up to 8 bar led to a 4.8-fold improvement in the lipase productivity. Besides lipase production, protease secretion into the medium was observed. Protease activity was inhibited by air pressure of 8 bar, indicating that pressure has different effect on lipase and protease activities. Moreover, an influence on metabolism leading to organic acids secretion is anticipated by this work. Through an automatic image analysis technique it was observed that cell exposure to increased air pressure did not induce hyphae formation but led to a cell size decrease for the 8 bar cultures.