PO108 - 24987 - BREWERY SPENT YEAST INSOLUBLE RESIDUE AS MICROCARRIERS FOR BIOACTIVE COMPOUNDS

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Keywords: Yeast cell wall, Incorporation of bioactive compounds, *Saccharomyces pastorianus*

Abstract

Brewery spent yeast (BSY), the second major by-product of beer industry, have been reported as a suitable source of immunostimulatory substances, such as glucans and mannoproteins. These cell wall compounds may be extracted by hot water followed by exhaustive alkali treatments, resulting in another by-product: an insoluble residue (BSYIR) with preserved spherical cell wall structure. Whereas yeasts and yeast cell wall particles have been reported as natural microcapsules, this study aims to evaluate the use of the *Saccharomyces pastorianus* BSYIR as a GRAS hollow microcarrier for incorporation of bioactive compounds. Alkali extractions increased the cell surface hydrophobicity, by shifting the water contact angle from 39° to 111°. On the other hand, the extractions did not cause a great impact on cell surface charge which ranged from 10.7 to -39.2 mV and from 6.2 to -32.1 mV for BSY and BSYIR, respectively, when ranging the pH from 2.3 to 8.9. Both materials showed neutral charge at pH 4 and higher net surface charge density near pH 8. Hydrophobic or electrostatic interactions between BSYIR and four model bioactive compounds (β-carotene, tryptophan, bovine serum albumin and lactoferrin) were evaluated. After preliminary tests, a Central Composite Rotatable Design was run for each compound except tryptophan which showed no detectable incorporation into BSYIR. Lactoferrin exhibited the highest incorporation efficiency (79.5%) and yield (29.8%) at optimized conditions (pH 6.0, 33 °C and 0.55 lactoferrin/BSYIR mass ratio (w/w)) suggesting the occurrence of electrostatic interaction once compounds were oppositely charged at this pH. β-carotene and albumin were suggested to have hydrophobic interactions with BSYIR, although the determination of incorporation efficiency and yield might be masked by some precipitation out of the matrix. These results may guide further studies of bioactive

compound immobilization onto or into BSYIR, system coating and stability, as well as bioactive release.

Acknowledgements

The authors thank CNPq (Brazil), CAPES (Brazil), SAE (UNICAMP, Brazil) and FCT (Portugal) for scholarships, research grants and financial support; Unicer Bebidas SA (Portugal) and FrieslandCampina Domo (The Netherlands) for donation of brewery spent yeast and lactoferrin, respectively.