

Matrix effect: a challenge to enhance the bioavailability of functional bioactive compounds derived from okara, the byproduct of soymilk production

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The rising interest towards sustainable food production has led to the exploitation of byproducts. Despite the fact they are considered wastes, byproducts are still containing a high quantity of nutrients and bioactive compounds. In the last few years, the effects of these molecules on health and food processing have been deeply explored. However, the “matrix effect” exerted by the supramolecular organization hasn’t aroused the same interest. Highly processed byproducts present this structural reorganization that could affect the release of compounds during their digestion, absorption and function on the target.

This work aims to release the protein fraction and other interesting molecules from okara using several extraction methods to overcome the matrix effect. Okara, the soymilk processing byproduct, has a protein content representing about 30% of its dry weight and it is largely produced generating an environmental and economic problem. Different approaches have been performed to increase the bioavailability and bioactivity of functional components. The fractions obtained in this way have been tested on human colorectal adenocarcinoma cells (CaCo2). In particular, cytotoxicity activity has been analyzed by testing different concentrations. Also, the protective effects on cell inflammation have been studied on cells, and the amount of IL1 β expressed has been measured. Since the expression levels of NF κ B mirror the expression of chemokine IL8, the expression of IL8 was quantified by qRT-PCR to evaluate the anti-inflammatory effect of peptides. The study has shown that each treatment has a different impact on the release of compounds, which also influences their bioactivity.

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