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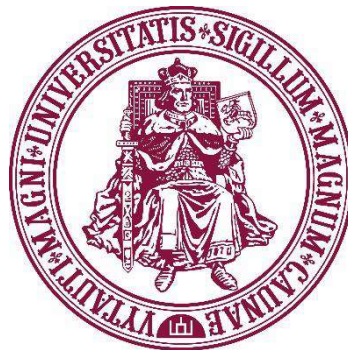
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ABSTRACT BOOK

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Application of Valorized Dairy and Cereal Industry By-Products for Nutraceutical Formulas Development

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Abstract

The zero-waste economy has many challenges, of which the most important is the need for attractive technologies for the effective recycling of by-products. One of challenges in dairy industry is to effectively use large quantities of dairy by-products, e.g., the milk permeate (MP). MP is a dairy industry by-product obtained during milk protein concentrate production. The aim of this study was to develop nutraceutical in chewing form (NC) preparations. The main ingredients used for the preparation of added-value nutraceuticals were MP (containing GOS), extruded and fermented wheat bran (containing $\geq 6.0_{\log 10}$ colony-forming unit CFU/g viable antimicrobial property showing the LAB strains), psyllium husk (PH) (source of desirable hydrocolloids), and apple by-products (AP) (source of phenolic compounds). Also, for the preparation of NC, gelatin and agar were tested. In the NC formulations, citric acid (CA) was replaced to ascorbic acid (AA) to obtain a desirable hard texture of samples with agar. The optimal quantities of bioactive ingredients were selected by performing an overall acceptability (OA) test and evaluating emotions induced by consumers. Moreover, viable LAB count during storage, colour, texture, and antioxidant characteristics were evaluated. The highest OA (score 8.5) was shown for samples consisting of MP, PH, AP, CA, and xylitol (XY), a very strong correlation was found between OA and the emotion “happy” ($r = 0.907^{**}$). After 14 days of storage, samples consisting of gelatin, MP, PH, AP, and CA showed a LAB count higher than $6.0_{\log 10}$ CFU/g, but higher antioxidant activity were found for the NC prepared with agar. Finally, it can be acknowledged that fermented MP, PH, and AP can be used for preparation of added-value NC in a sustainable manner.

Keywords: nutraceuticals, overall acceptability, emotions induced in consumers, milk permeate, psyllium husk, apple by-products.

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