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ABSTRACT BOOK

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3D Printed Rigid Food Packaging Based on Polylactic Acid Modified with Nano-Silver for the Storage of Cow Cheese

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Abstract:

Polylactic acid (PLA) is a biodegradable biopolymer obtained from renewable resources, such as corn, wheat or potatoes starch (Balla et al. 2021). It can replace polymers of petroleum origin, thus reducingthe gas emissions. Due to its compatibility with different compounds, PLA can be modified either by surface deposition or by incorporation. Among the modified agents are silver ions that exert antimicrobialactivity (Balla et al. 2021). The purpose of this study was to prepare a rigid biodegradable packaging of PLA by 3D printing (Figure 1), to modify it with nano-Ag and to test its preservative action while keeping fresh cow cheese inrefrigerated conditions. The results showed that the rigid packaging PLA-nano-Ag preserved the organoleptic characteristics of the cow cheese until day 12 of storage, compared to the unmodified PLA, where the cheese showed slight changes from day 6 of storage followed by sharp deterioration (Figure 2).Also, the lowest variation in the cheese moisture and acidity was recorded in the case of cheese kept in therigid packaging PLA-nano-Ag, due to the nano-silver`s antimicrobial effect. According to the Romanian Standard (SR 1981 / January 2008), the cow cheese can be stored in safety conditions for a maximum of 10 days in the unchanged PLA package and in the PLA-nano-Ag package more than 12 days.

Phycocyanin Enrichment of Minimally Processed Organic Apples

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Abstract:

Recently microalgae have become promising resources to obtain functional ingredients to be used to increase the nutritional value to foods. Spirulina platensis, also known as spirulina or Arthrospira, is a blue-green filamentous prokaryotic cyanobacterium with a protein content of 55–70%, which includes the entire range of essential amino acids, many vitamins, minerals, essential fatty acids and pigments such as phycocyanin. In the present study the phycocyanin was used to enrich organic fruits. For this purpose, apple tissues were selected for trials and a solution containing phycocyanin extracted from the microalgae Arthrospira platensis was used to obtain a nutrient-enriched product. The optimised vacuum impregnation (VI) process (200 mbars, 20 min) resulted in an impregnation yield of around 25%, in agreement with the level of porosity of the apple variety selected (Golden Delicious). The enriched apples were stored under refrigerated conditions and their shelf-life was monitored for 10 days. Various quality-related and nutritional analytical determinations were carried out throughout the storage period. In addition, the microbiological quality of the MP apples was monitored for 10 days in refrigerated conditions. Based on the physical and microbiological determinations, the shelf-life of the product was set at 7 days, which is in line with similar products already on the market, but not enriched with Arthrospira platensis. The authors acknowledge the financial support for this research provided by transnational funding bodies, partners of the H2020 ERA-NETs SUSFOOD2 and CORE Organic Cofunds, under the Joint SUSFOOD2/CORE Organic Call 2019 (MILDSUSFRUIT).