

Sustainable Sources of Antioxidants for Dairy: Application of Mediterranean Plant Extracts in Cheese Coatings

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Abstract

The use of sustainable, polyphenol-rich plant extracts such as particularly olive leaf, thyme, and green walnut husk extracts, offers promising opportunities for enhancing the oxidative stability of dairy products. This study evaluated the incorporation of olive leaf and thyme extracts into whey-protein/carrageenan edible coatings applied to semi-hard cheese during 20 days of ripening (12 °C; 78% RH). The extracts, characterised by total phenolic contents of 113.67 mg GAE/g dm (olive leaf) and 166.92 mg GAE/g dm (thyme), were incorporated at 0.1% (v/v) into the coating formulation. Physicochemical properties, colour parameters and antioxidant activity (FRAP) were monitored throughout ripening. The addition of plant extracts did not significantly affect cheese composition (protein, fat, dry matter, SFA), confirming good compatibility with the cheese matrix. Extract-enriched coatings induced distinct surface colour changes, attributable to the natural pigment and phenolic profile of the botanicals. Importantly, cheeses coated with olive leaf or thyme extract exhibited a significant increase in antioxidant activity compared with the control, demonstrating effective polyphenol transfer and preserved functionality during ripening. These results highlight the potential of Mediterranean plant extracts as sustainable natural antioxidants for clean-label dairy innovation and by-product valorisation.

Keywords

Dairy coatings, olive leaf extract, thyme extract, clean-label innovation, by-product valorisation.

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