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## OPTIMIZATION OF FRUIT DRYING PROCESSES: NOVEL STRATEGIES FOR COLOR STABILITY AND BIOACTIVE COMPOUND PRESERVATION

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This summary compares two drying strategies, analyzing their effects on the color, total polyphenol and flavonoid content, and antioxidant activity of dehydrated fruits. The first study, using Prata bananas, evaluated pretreatments before convective drying at 60°C. Osmotic Dehydration (OD) with coconut sugar caused the greatest color change (high  $\Delta E$ ), darkening the slices (reduction in  $L^*$ ), but increased the total flavonoid content (TFC) to 58.61 mg/100 g and maintained antioxidant activity (AA), due to the impregnation of compounds from the sugar. The Ethanol pretreatment with Vacuum Pulse (ETVP) resulted in the highest retention of total phenolics (TPC  $\approx$  1200 mg GAE/100 g) and antioxidant activity, in addition to minimizing the total color change ( $\Delta E$ ) compared to OD alone. The second study, with Granny Smith apples, investigated hybrid drying using Refractance Window with Microwaves (RW-MW) at 98°C. The RW-MW technique at 700 W/kg significantly preserved total phenolics (TPC of 9.95 mg GAE/g dry basis), representing 96% retention compared to the fresh fruit, and maintained the highest antioxidant activity (46.12  $\mu$ mol TE/g dry basis). The color change ( $\Delta E$ ) was lower (9.7) in the higher power treatment (1000 W/kg), with no significant differences between the methods. In conclusion, both approaches are effective for preserving bioactive compounds. The use of osmotic agents like coconut sugar (Article 1) can enrich the product, while fast techniques like RW-MW (Article 2) minimize thermal degradation. ETVP and RW-MW stand out for combining efficiency with high nutritional and sensory quality.

### Referências bibliográficas:

MACEDO, L. L. et al. Applying vacuum pulse during ethanol pretreatment to enhance the drying rate and quality of fresh and osmo-dehydrated banana slices using coconut sugar. Food Research International, v. 208, p. 116115, maio 2025.

RAMÍREZ, C. et al. Simultaneous application of refractance window and microwave drying: A novel hybrid technique for fruit dehydration to reducing drying time and improve bioactive compound retention. Future Foods, v. 12, p. 100709, dez. 2025.

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Orientador (a)

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