Effect of Black Chokeberry Pomace on Ice Cream Antioxidant Properties and Color

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BACKGROUND

WHY FOOD BY-PRODUCTS?

- Large amount generated each year
- Environmental impact
- Rich in bioactive compounds (dietary fiber, polyphenols)

THE AIM OF RESEARCH: ice cream ENRICHMENT

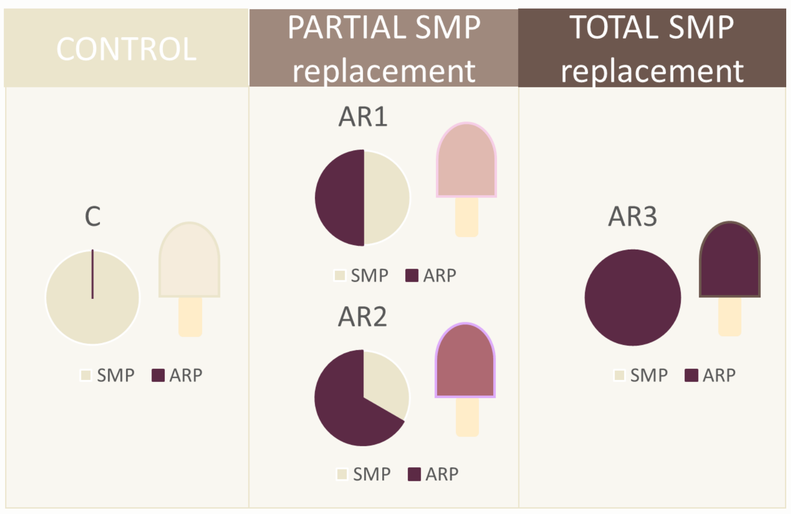
- Natural color and flavor enhancement
- Improved nutritional value
- Enhanced antioxidant activity

CHALLENGES

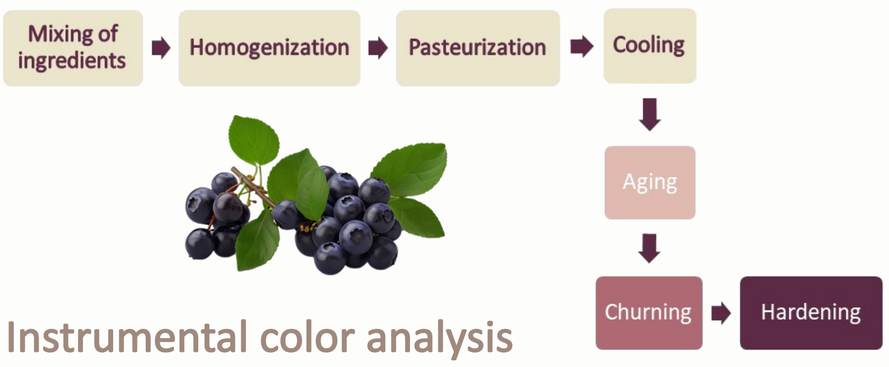
- Variability in by-product composition
- Impact on sensory properties
- Interactions with ice cream matrix (affecting physicochemical properties)

MATERIALS AND METHODS

Samples



Ice cream production



Instrumental color analysis

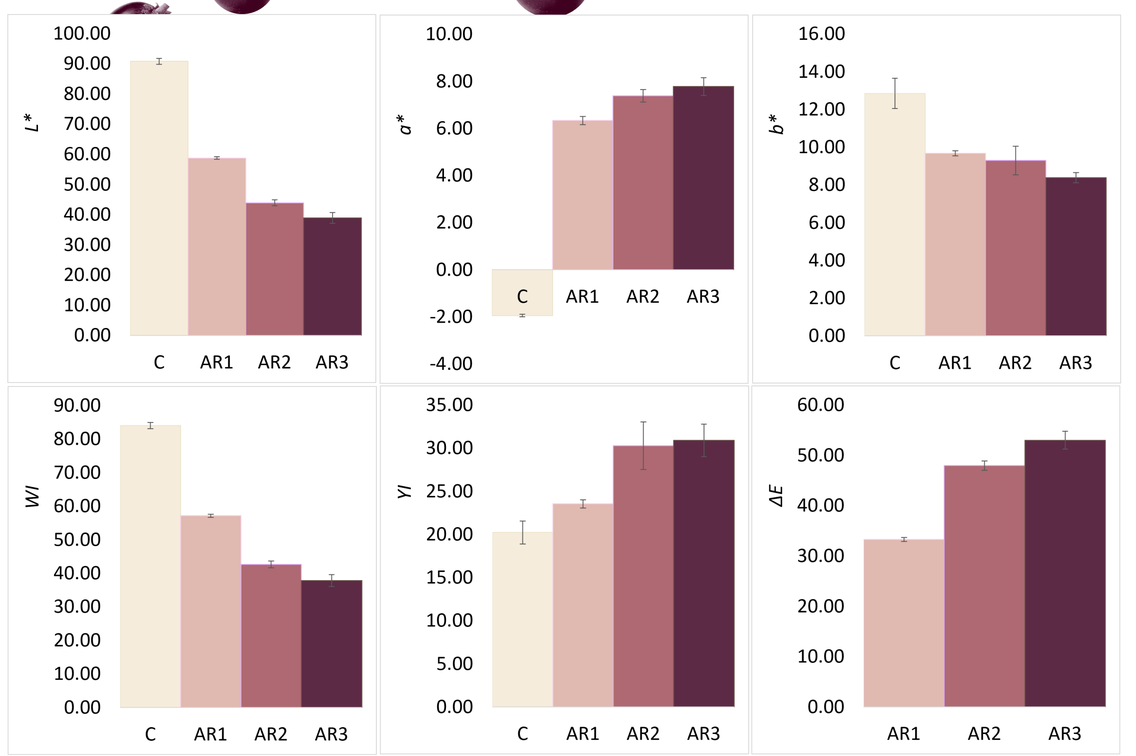
- *L**, *a** and *b** values
- Whiteness and yellowness index (*WI*, *YI*)
- Total color difference (*ΔE*)

Antioxidant properties

- Total phenolic content (TPC, Folin-Ciocalteu method)
- Antioxidant activity (DPPH, FRAP, ABTS assay)

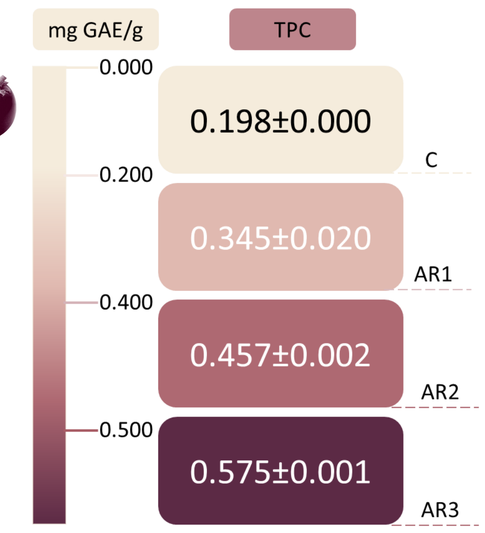
RESULTS

COLOR PROPERTIES



Pigments → **Reduced lightness, escalated redness (*a**)**

TOTAL PHENOLIC CONTENT



DOSE RESPONSE

Replacement of SMP proportionally elevated polyphenol concentration and antioxidant activity

ANTIOXIDANT PROPERTIES

STRONG INCREASE

Sample	DPPH assay (% DPPH inhibition)	ABTS assay (mg TE/g)	FRAP assay (mg TE/g)
C	14.42±0.26	0.35±0.00	0.29±0.00
AR1	34.90±1.61	7.44±0.27	2.38±0.04
AR2	44.13±3.60	11.14±0.36	3.64±0.02
AR3	46.24±1.86	17.37±0.25	5.05±0.13

TE = trolox equivalent

CONCLUSIONS

- Strong increase in antioxidant activity with higher chokeberry pomace content
  - Ice cream with functional properties
- Significant color change (polyphenols from chokeberry – anthocyanins)
  - Visually appealing product
- Promoting sustainable food systems and supporting circular economy

ACKNOWLEDGMENTS

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