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Influence of Plant-Based Powders on the Quality of Blueberry Jam

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Abstract

This study aims to develop and characterize different formulations of blueberry jam (*Vaccinium myrtillus* L.) incorporating rosehip (*Rosa canina* L.) and apple peel (*Malus domestica* Borkh.) powders at concentrations of 2% and 4%. The influence of these additions on the physicochemical, antioxidant and sensory properties of the jam was evaluated.

Keywords: blueberry jam, rosehip powder, apple peel powder, physicochemical properties, antioxidant activity, sensory evaluation.

1. Introduction

- Blueberries are a rich source of polyphenols, anthocyanins and antioxidants.
- **Rosehip** powder is valued for its high vitamin C and phenolic content.
- **Apple peel powder** provides dietary fiber and bioactive compounds.
- The addition of these plant-based powders can improve the functional and sensory quality of blueberry jam.

2. Materials and Methods

- **Raw materials:** blueberries (*Vaccinium myrtillus* L.), rosehip powder (*Rosa canina* L.), apple peel powder (*Malus domestica Borkh.*), sugar, lemon juice.
- **Formulations:** control (BJ-C) and four experimental variants with 2% and 4% rosehip powder (BJ-RP2, BJ-RP4) and apple peel powder (BJ-AP2, BJ-AP4).
- **Analyses:** moisture, dry matter, °Brix, pH, titratable acidity, ash, total phenolic content (TPC), antioxidant activity (DPPH), sensory evaluation (15 assessors, 1–5 scale).

Technological process for blueberry jam

Reception of raw materials (blueberries, rosehip and apple peel powders)
↓
Sorting and washing the blueberries
↓
Formulation (mixing of ingredients according to recipe)
↓
Thermal processing (boiling to ~65 °Brix)
↓
Hot filling and sealing (glass jars)
↓
Cooling and storage (5–20 °C)

Experimental formulations

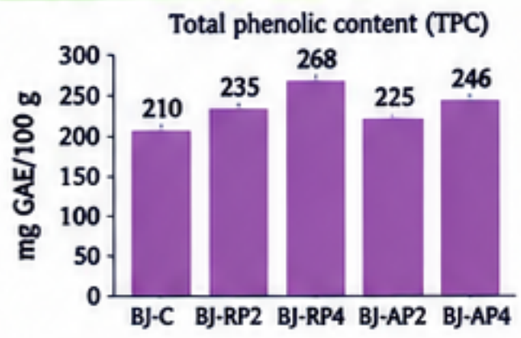
Code	Formulation	Plant-based powder (% w/w)
BJ-C	Blueberry jam (control)	–
BJ-RP2	Blueberry jam + rosehip powder	2%
BJ-RP4	Blueberry jam + rosehip powder	4%
BJ-AP2	Blueberry jam + apple peel powder	2%
BJ-AP4	Blueberry jam + apple peel powder	4%

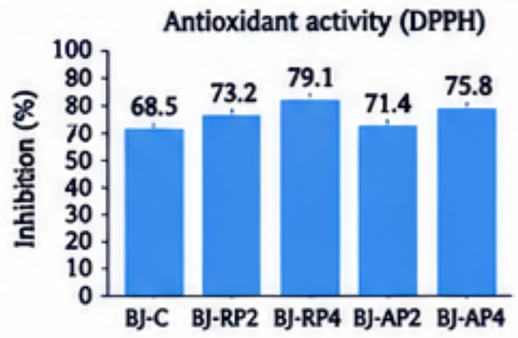
3. Results and Discussion

3.1. Physicochemical properties of blueberry jam

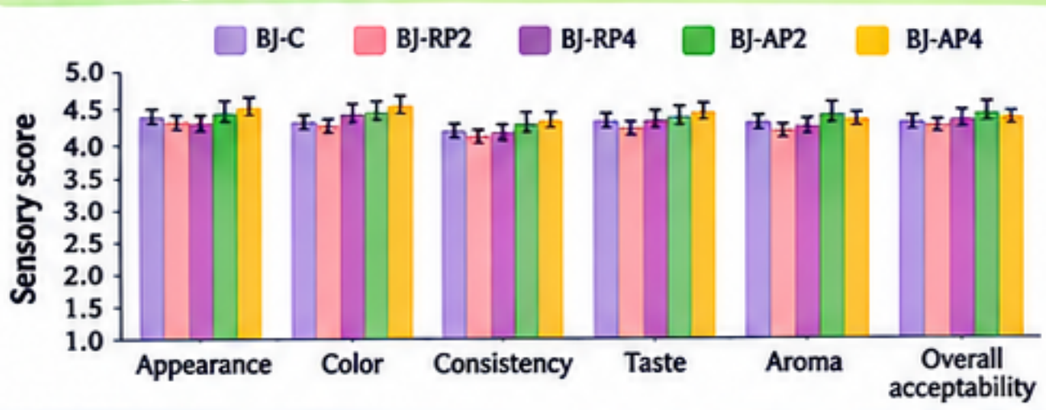
Parameter	BJ-C	BJ-RP2	BJ-RP4	BJ-AP2	BJ-AP4
Moisture (%)	34.8	33.5	32.1	33.9	32.8
Dry matter (%)	65.2	66.5	67.9	66.1	67.2
°Brix (%)	64.5	65.1	65.8	64.9	65.4
pH	3.25	3.18	3.10	3.29	3.32
Titratable acidity (% citric acid)	0.82	0.91	1.02	0.79	0.76
Ash (%)	0.38	0.42	0.47	0.40	0.44

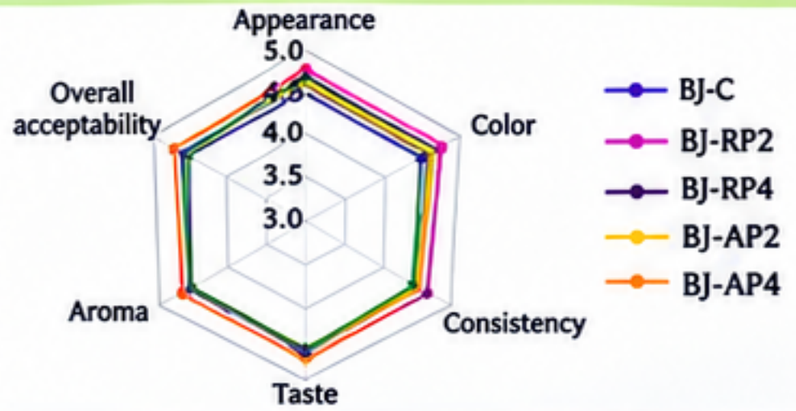
3.2. Bioactive potential





3.3. Sensory evaluation





4. Conclusions

- The addition of rosehip and apple peel powders improved the bioactive potential of blueberry jam, increasing the total phenolic content and antioxidant activity.
- Physicochemical properties were slightly influenced, with a decrease in moisture and an increase in dry matter and °Brix.
- The highest overall acceptability was obtained for the variant with 2% rosehip powder (BJ-RP2).
- Plant-based powders are valuable ingredients for developing blueberry jams with enhanced functional and sensory qualities.

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