

RESEARCH ON IMPROVING BREAD QUALITY BY ADDING FRUITS FROM THE *PRUNUS* GENUS

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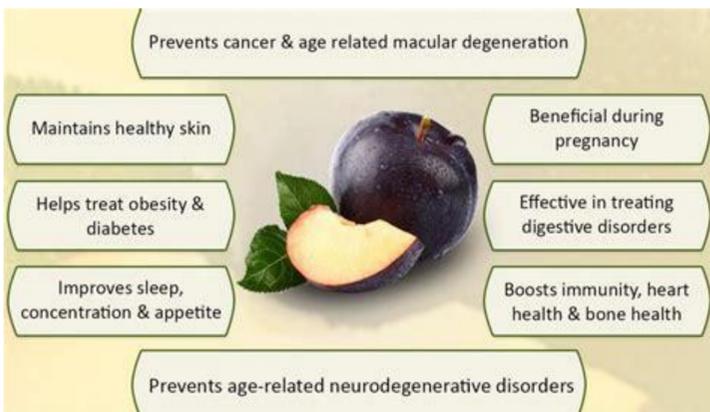


Introduction

Fruit's enhanced hydration properties, fermentability, phytochemical content, and balanced ratio of soluble and insoluble fibre make it a suitable fibre enrichment ingredient for bakery products. They can be processed to create jams, compotes, jellies, candied fruits, and baked items, or they can be consumed fresh or dried. The literature has extensively discussed the use of fruits from the *Prunus* genus in the food sector, including for making dough for extruded foods, creams, puddings, ice cream, and bakery and pastry products. This study aims to analyze the effect of the addition of dried plum flour on the physicochemical and sensory characteristics of bread, in order to determine the optimal incorporation percentage.

Materials and methods

Wheat flour type 650 and dried plum flour were used in the manufacturing processes. Plums flour was obtained by freeze-drying and grinding. Four bread variants were formulated: control (0% dried plum flour), and three variants with the addition of 5%, 10% and 15% dried plum flour, relative to the total flour mass. The following were analyzed: moisture, titratable acidity, fiber content, total phenolic compounds and antioxidant activity. Sensory analysis was performed using a semi-trained panel (n = 20), evaluating attributes such as: color, texture, porosity, taste, shell appearance and general acceptability, on a 9-point hedonic scale.

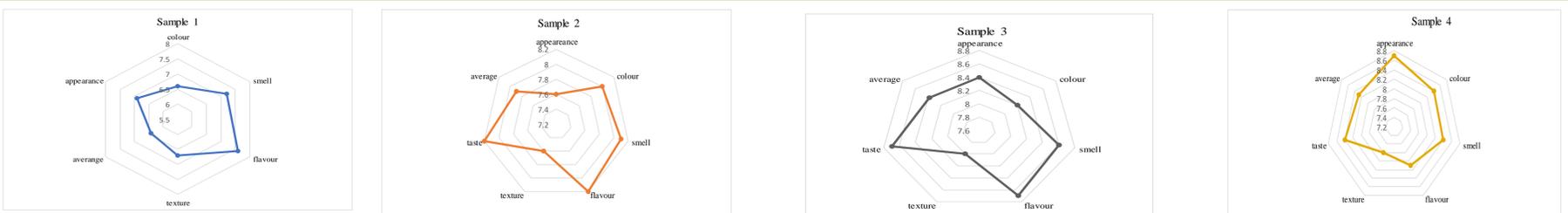


Functional properties and pharmacological effects of plums

Bread with dried plum flour

Results and discussion

The potential use of fruits from the *Prunus* genus in the creation of bakery products is also covered in detail in the paper. The addition of dried plum flour significantly influenced the physicochemical characteristics of the bread. The fiber content and antioxidant activity increased proportionally with the addition level, reaching maximum values in the variant with 15% dried plum flour. The moisture content was slightly higher in the samples with the addition, and the porosity of the core was optimal in the 5% and 10% variants. Sensory analysis revealed that the 5% variant obtained the highest score for texture and appearance of the crust, while the 10% and 15% variants were preferred by a segment of the tasters for the intense taste, specific to plums. No significant differences were recorded in terms of overall acceptability between the samples with 10% and 15% dried plum flour.



Sensory analysis of bread samples

Texture parameters of the bread samples with different levels of dried plum flour

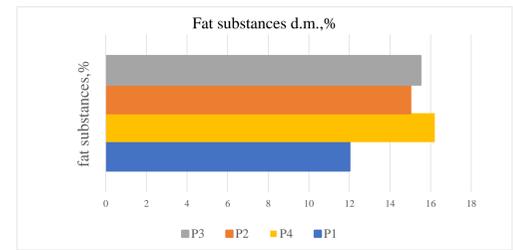
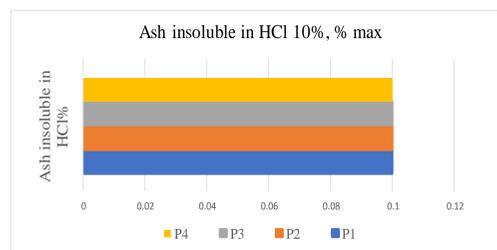
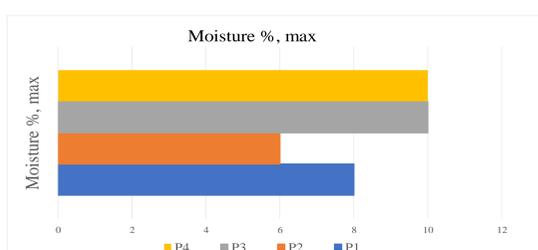
Bread samples	Firmness (N)	Gumminess (N)	Cohesiveness (Adimensional)	Chewiness (J)	Resilience (adimensional)
P1 control	9.55±3.05 ^a	7.28±1.72 ^c	0.48±0.03 ^d	7.28±1.72 ^c	1.94±0.04 ^d
P2	9.21±4.05 ^a	7.05±1.57 ^c	0.46±0.02 ^b	7.05±1.07 ^c	1.82±0.06 ^c
P3	8.7±1.58 ^a	6.20±3.05 ^b	0.38±0.03 ^c	6.20±3.05 ^b	1.61±0.05 ^d
P4	8.46±3.55 ^a	5.48±4.02 ^b	0.31±0.02 ^a	5.48±2.02 ^b	1.43±0.03 ^a

The results are the mean standard deviation (n=3). Bread samples(P1-P4), means values in the same column followed by different letters are significantly different (p<0.05).

Alveograph parameters of the dough samples

Dough samples	P[mm]	L[mm]	G(mm)	W[10 ⁻⁴ J]	P/L
P1- control	86±2.51 ^a	87±1.15 ^c	18.2±0.28 ^b	241±5.42 ^d	0.99±0.05 ^a
P2	91±1.15 ^b	78±4.62 ^b	16.8±0.30 ^b	136±6.32 ^d	1.78±0.15 ^b
P3	124±1.15 ^b	64±2.0.8 ^a	15.1±0.60 ^{ab}	132±5.28 ^c	1.86±0.25 ^d
P4	141±1.52 ^b	52±2.88 ^a	14.2±0.37 ^b	128±4.58 ^{ab}	1.92±0.24 ^d

P, maximum pressure; L; dough extensibility; G index of swelling; W baking strength; P/L configuration ratio of the alveograph curve. The results are the mean ±standard deviation (n=3).



Physical-chemical properties of the finished product

Conclusions

The addition of dried plum flour in bread formulation favorably influences both the nutritional value and the sensory properties of the final product. The level of 15% proved to be optimal, providing a balance between functional intake and sensory acceptability, without negatively affecting the technological qualities of the bread. These results support the use of dried plum flour in the development of value-added bakery products, in line with current requirements for healthy and sustainable nutrition. Research will continue to capitalize on other options for adding *Prunus domestica* fruits to bakery products.