

TECHNOLOGICAL TREATMENTS TO OBTAIN HIGH-QUALITY FOOD PRODUCTION

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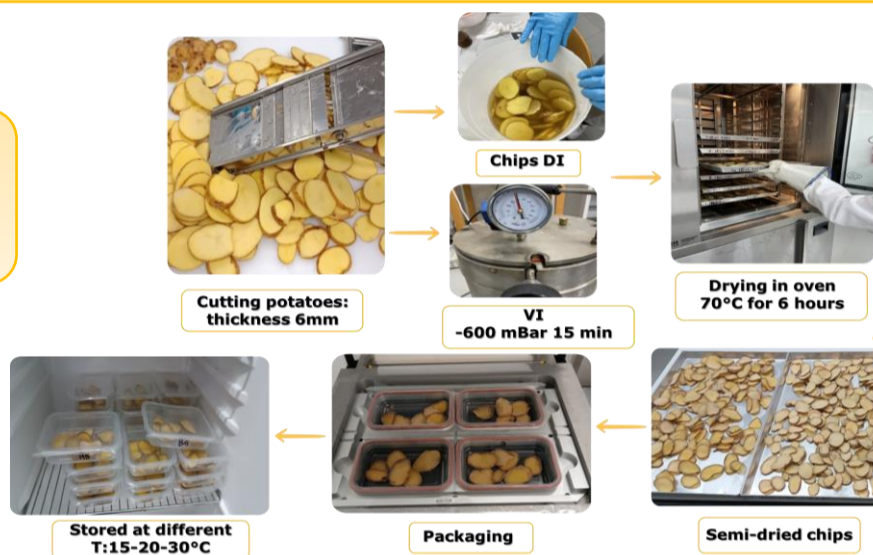
INTRODUCTION

The aim of this research is to evaluate the effects of applying vacuum impregnation and dipping using natural antioxidants on the Protected Geographical Indication (PGI) potato from Sila. These methods are intended to reduce the degradation phenomena that occur following the processing of vegetable-base foodstuffs and to enhance their nutritional content. Vacuum impregnation (VI) and dipping tests (DI) were carried out using a solution of water and calcium chloride (CaCl_2 2% w/v) and an aqueous solution enriched with the addition of an antioxidant extract (2% w/v) derived from bergamot pomace (*Citrus bergamia* Risso). Subsequently, the potato slices were cooked to a semi-dry state.

MATERIALS AND METHODS

- ❖ **A:** Control (dipping in water solution)
- ❖ **B:** VI solution AE 2% and CaCl_2 2%
- ❖ **C:** VI solution AE 2%
- ❖ **D:** DI AE 2% and CaCl_2 2%
- ❖ **E:** DI AE 2%

- ✓ Color CIEL*a*b*
- ✓ Texture analysis (Zhao et al., 2022)
- ✓ MC (%) and a_w
- ✓ TPC (Burgos et al. 2013)
- ✓ DPPH (Yamaguchi et al. 1998)



RESULTS

The current study explained the importance of vacuum impregnation pretreatment combined with the addition of an antioxidant extract for the preservation of a new semidry local product

Table 1: Antioxidant characterization of AE

PARAMETERS	RESULTS
TPC (mg L ⁻¹ GAE)	13856.2±267.2
TFC (g L ⁻¹ CE)	3285.1±69.4
DPPH (μmol Trolox mL ⁻¹)	35.7±1.9
ABTS (μmol Trolox mL ⁻¹)	5.9±0.3
Neoferiocitrin (mg L ⁻¹)	2093.70±45.34
Naringin (mg L ⁻¹)	1346.71±9.04
Neohesperidin (mg L ⁻¹)	106.72±4.93

Table 2: Colour parameters of fresh and semidry potatoes slices

	L*			a*			b*		
	Fresh	Semi-dry	Sign	Fresh	Semi-dry	Sign	Fresh	Semi-dry	Sign
A	61.0±3.2 ^b	56.5±3.0 ^a	**	0.1±0.0	1.3±0.9 ^b	**	19.9±3.2 ^c	11.3±1.4 ^c	**
B	65.6±3.0 ^a	57.2±3.4 ^a	**	0.2±0.0	2.7±0.7 ^a	**	24.8±2.5 ^a	19.7±1.9 ^a	**
C	63.0±3.2 ^{ab}	47±12.1 ^c	**	0.1±0.0	2.2±1.1 ^{ab}	**	20.4±2.8 ^{bc}	17.6±1.8 ^{ab}	**
D	63.5±2.7 ^{ab}	53.8±5.7 ^{ab}	**	0.1±0.0	2.4±0.8 ^a	**	22.6±2.3 ^{abc}	15.8±2.6 ^b	**
E	65.1±2.1 ^a	49.2±3.7 ^{bc}	**	0.3±0.0	3.0±1.0 ^a	**	22.8±2.8 ^{ab}	18.3±4.3 ^{ab}	**
Sign	**	**		n.s.	**		**	**	**

Table 3: Colour parameters of semidry potatoes during storage

Samples	L*			a*			b*		
	t0	tf	Sign	t0	tf	Sign	t0	tf	Sign
B	57.17±3.39 ^a	54.56±5.2 ^a	*	2.67±0.72 ^{ab}	1.66±0.31 ^c	**	19.66±1.82 ^a	10.29±1.84 ^c	**
C	46.79±3.38 ^c	56.17±3.8 ^a	**	2.24±1.04 ^b	4.14±0.72 ^a	**	17.65±1.81 ^{bc}	18.85±2.63 ^{ab}	**
D	53.81±5.56 ^b	51.13±4.02 ^b	*	2.36±0.78 ^b	3.76±0.81 ^a	**	15.83±2.21 ^c	19.11±2.72 ^a	**
E	49.23±3.64 ^c	57.34±6.13 ^a	**	3.04±0.96 ^a	3.2±0.63 ^b	n.s.	18.34±4.24 ^{ab}	17.13±3.16 ^b	ns
Sign	**	**		**	**		**	**	**
B	57.17±3.39 ^a	53.63±4.94 ^b	**	2.67±0.72 ^{ab}	3.34±1.02 ^a	**	19.66±1.82 ^a	15.97±2.35 ^b	**
C	46.79±3.38 ^c	46.27±3.96 ^c	n.s.	2.24±1.04 ^b	3.83±0.89 ^a	**	17.65±1.81 ^{bc}	16.2±3.53 ^b	*
D	53.81±5.56 ^b	53.17±3.92 ^b	n.s.	2.36±0.78 ^b	3.37±0.8 ^a	**	15.83±2.21 ^c	20.37±3.23 ^a	**
E	49.23±3.64 ^c	63.41±4.71 ^a	**	3.04±0.96 ^a	1.52±0.61 ^b	**	18.34±4.24 ^{ab}	13.55±2.13 ^c	**
Sign	**	**		**	**		**	**	**
B	57.17±3.39 ^a	54.52±6.95	n.s.	2.67±0.72 ^{ab}	3.92±0.95	**	19.66±1.82 ^a	15.21±2.29	**
C	46.79±3.38 ^c	53.74±6.25	**	2.24±1.04 ^b	3.76±0.84	**	17.65±1.81 ^{bc}	15.46±3.64	**
D	53.81±5.56 ^b			2.36±0.78 ^b			15.83±2.21 ^c		
E	49.23±3.64 ^c			3.04±0.96 ^a			18.34±4.24 ^{ab}		
Sign	**	ns		**	ns		**	ns	

Table 4: TPC and DPPH of fresh and semidry potatoes slices

	TPC (mg g ⁻¹ dw)			DPPH (μmol TE kg ⁻¹ dw)		
	Fresh	Semi-dry	Sign	Fresh	Semi-dry	Sign
A	41.1±0.8 ^c	76.9±0.5 ^b	**	60.7±4.0	129.0±1.9 ^b	**
B	48.5±0.8 ^b	78.7±2.8 ^b	**	63.8±3.7	128.5±1.1 ^b	**
C	54.7±0.6 ^a	88.0±2.3 ^a	**	76.4±8.8	204.3±1.6 ^a	**
D	42.1±1.2 ^c	76.0±0.3 ^b	**	65.4±4.2	131.8±5.6 ^b	**
E	44.3±0.2 ^c	90.35±2.0 ^a	**	67.1±4.0	208.4±6.5 ^a	**
Sign	**	**		n.s.	**	

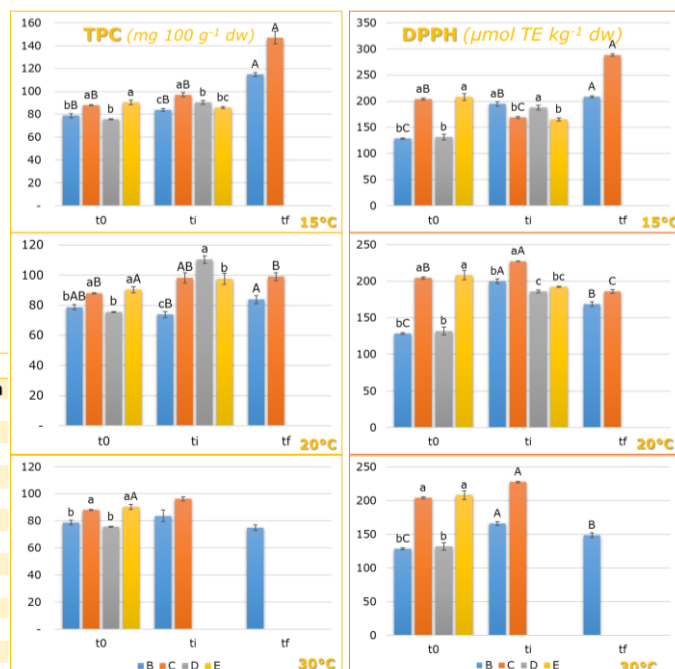


Figure 1: TPC and DPPH of semidry potatoes during storage (t0= initial time; ti: intermediate time; tf: final time)

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Zhao, W, Wang, Y, Ma, Y, Liang, H, & Zhao, X (2022). Effect of vacuum impregnation on enzymatic browning of fresh-cut potatoes during refrigerated storage. *International Journal of Food Science & Technology*, **57**: 983-994.