Valorization of stone fruit by assessing the acceptability and suitability for minimally-processing

Virginia Prieto-Santiago, Ingrid Aguiló-Aguayo, Angela Chic, Maribel Abadias*
IRTA, Postharvest, Parc Agroalimentari, Edifici Fruitcentre, Parc de Gardeny, 25003 Lleida, Spain

INTRODUCTION

The stone fruit sector is highly affected by overproduction and stable consumption, generating a large amount of waste. Along with the development of new varieties, valorization through processing into products that maintain their nutritional properties and are more attractive to the consumer is an opportunity for the agri-food sector, leading to the reduction of waste and favoring responsible consumption.

Fig.1. Sustainable Development Goals (SDGs)

Therefore, this work "Valorization of peaches and nectarines by assessing their acceptability and suitability for minimal processing" is aligned with 12 ("Responsible consumption and production") of "the Sustainable Development Goals (SDGs)".

OBJECTIVE

To valorize stone fruit through the evaluation of the suitability of ten nectarine and peach varieties for minimally-processing (fresh-cut)

MATERIAL AND METHODS

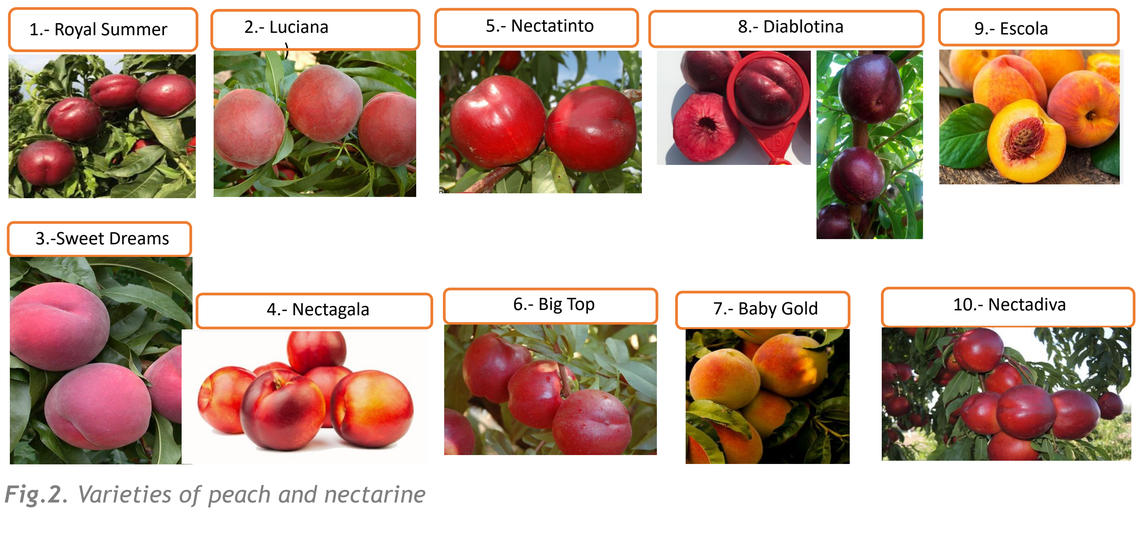

Fig.2. Varieties of peach and nectarine

Nectarines and peaches (Fig. 2) were harvested and stored at 0.5°C. In fresh-cut processing **(Fig. 3)**, the fruit was disinfected, peeled, cut, treated (With or without commercial treatment (NEC, Agricoat Naturseal, UK)), packed in polypropylene trays, sealed with a semi-permeable film and stored at 5°C for 10 days.

Physicochemical quality (firmness, soluble solids (SS), pH, titratable acidity (TA) and ripening index), sensorial acceptance and nutritional quality (polyphenol content (TPC) and antioxidant capacity (FRAP)) of the fresh-cut products was analysed after 1, 3, 6, 8 and 10 days of cold storage.

Fig.3. Fresh-cut nectarine and peach processing

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Contact: Isabel.abadias@irta.cat

RESULTS AND DISCUSSION

1 Varieties suitability for processing

- Peach varieties (Sweet Dream, Baby Gold and Escola), despite being more sensorially acceptable, presented a shorter shelf-life than the nectarine varieties (Table 1).
- The antioxidant capacity (FRAP) and the total polyphenol content (TPC) the of the "Diablotina" variety (red flesh) were significantly higher (between 2 and 10 times) than the other varieties (highlighted in pink).
- The nectarine varieties “BigTop” and “Luciana” could be considered suitable because of their extended shelf-life (8 days) and acceptability score (highlighted in green).

Table 1. Physico-chemical properties, shelf-life, acceptaoility scores and nutritional composition of the fresh-cut products obtained from the nectarines and peach varieties studied for proccessing.

Variety	Firmness (Kg)	SST (ºBrix)	pH	TA (g malic acid/L)	Rippening index	Shelf life (days)	Acceptability score (Day 1)	TPC (mg GAE/100g fresh weight)	AOX (FRAP) (mg AAE/100 g fresh weight)
BIG TOP	5.9	11.8	4.19	3.95	2.81	8	5.7	9.46	67.34
ROYAL SUMMER	5.3	10.0	2.88	4.36	3.46	6	6.1	9.98	43.12
BABY GOLD	2.6	10.9	4.59	3.83	2.37	3	7.0	18.96	110.00
DIABLOTINA	5.1	15.0	12.76	~	1.17	6	6.1	46.79	463.56
ESCOLA	5.3	10.1	6.41	3.76	1.58	6	6.6	18.33	125.96
NECTADIVA	3.6	18.3	2.34	4.46	7.80	1	~	20.97	136.81
NECTATINTO	3.2	16.2	2.81	4.4	5.76	6	5.1	27.41	200.77
LUCIANA	2.9	12.5	3.12	4.11	4.01	8	6.2	9.38	60.84
SWEET DREAM	2.3	11.5	2.67	4.32	4.31	6	6.0	13.64	126.42
NECTAGALA	6.3	10.3	3.81	4.06	2.71	6	4.4	14.32	153.05

2 Fresh-cut optimization

The application of an antioxidant coating (NEC) in the fresh-cut product improved visual appearance (Fig.4.A), acceptability scores (Fig.5.A) and nutritional properties (Fig.6) in “Big Top” nectarine.
However, the treatment with NEC led to a glassy appearance and artificial sweet flavors in “Luciana” (Fig.4.B) nectarine.

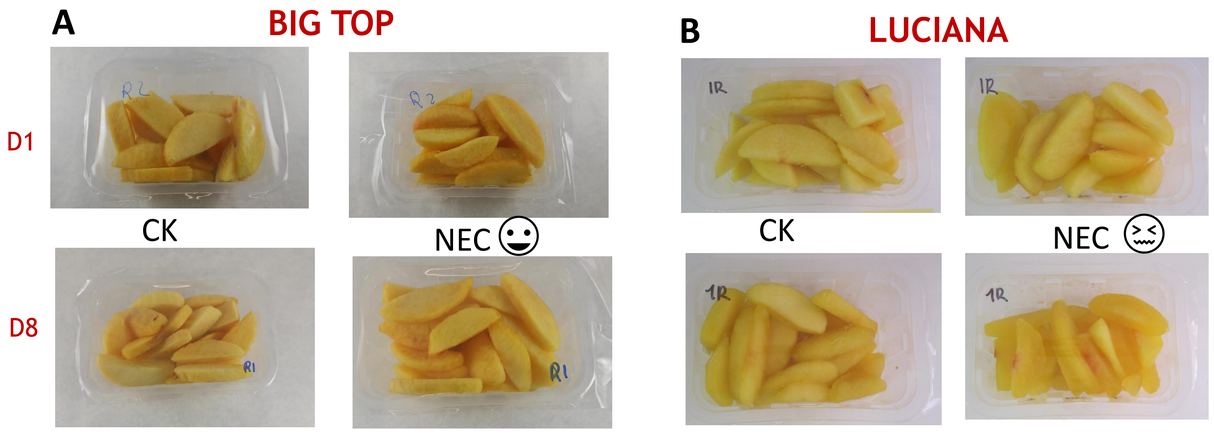

Fig. 4. Appearance of fresh-cut “Big Top” (A) and “Luciana” (B) after processing (D1) and after 8 days of storage at 5ºC (D8) with (NEC) and without (CK) “NEC” treatment.

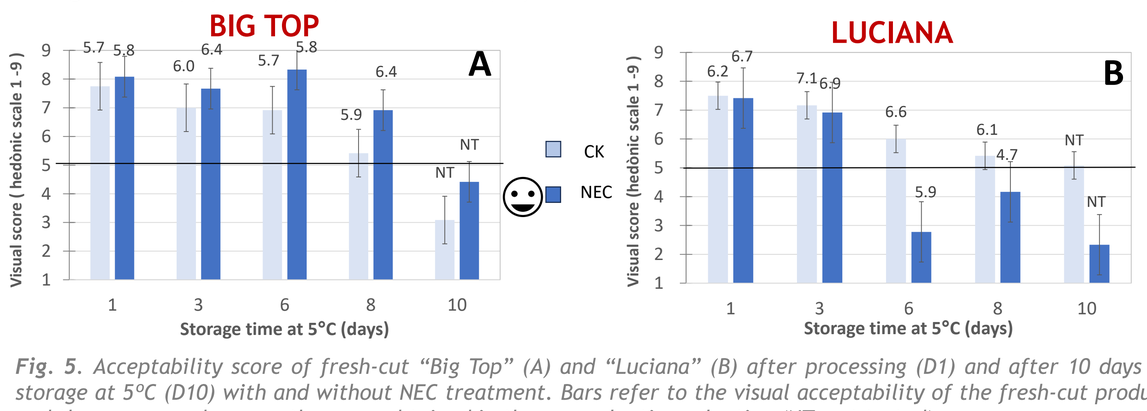

Fig. 5. Acceptability score of fresh-cut “Big Top” (A) and “Luciana” (B) after processing (D1) and after 10 days of storage at 5ºC (D10) with and without NEC treatment. Bars refer to the visual acceptability of the fresh-cut product and the upper numbers are the score obtained in the organoleptic evaluation (NT=not tasted).

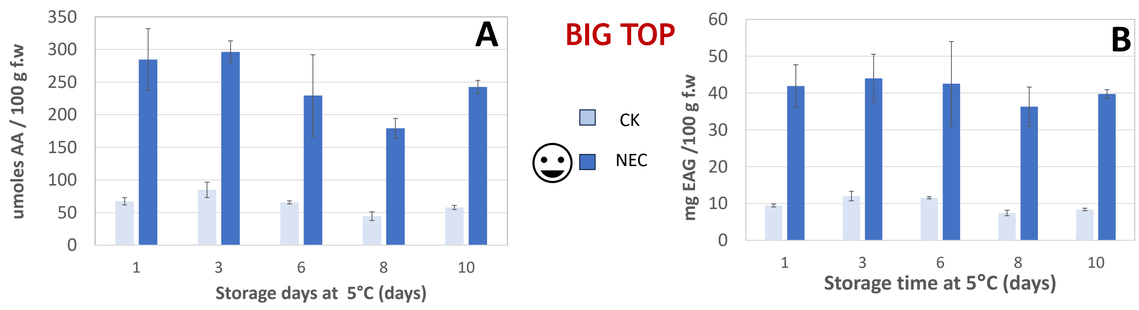

Fig. 6. Antioxidant capacity (FRAP- mg AAE/100 g fw) (A) and Total Polyphenol Content (TPC- mg EAG/100g f.w) (B) of fresh-cut “Big Top” after processing (D1) and after 10 days of storage at 5ºC (D10) with (NEC) and without (CK) “NEC” treatment.

CONCLUSIONS

- Nectarine varieties were more suitable for processing than peach varieties. "Big Top" and “Luciana” were the varieties that maintained the highest visual quality during its 8-day shelf life.
- The treatment with the antioxidant "NEC" improved the visual, sensory and nutritional quality of the fresh-cut product. However, a glassy appearance and artificial sweet flavours could appear in the fruit after the treatment with the antioxidant (NEC).