

Fruit & Veg Processing

2nd Euro-Mediterranean Symposium



Avignon, 4-6 April 2016

2nd Euro-Mediterranean Symposium on Fruit and Vegetable Processing

An integrated view on sustainability and how it can interact with quality, safety and the consumers

Sustainable processing for high quality Fruit & Vegetables

Fruit and vegetables are an essential part of a balanced diet, both for nutrition, taste and diversity, and they are mostly consumed as processed products. How will we be able to meet the challenge of inventing more sustainable ways to process fruit and vegetables and deliver them to the consumers? How will we ensure that they allow at least the same levels of quality, of safety, of convenience and consumer acceptability? That they decrease losses and waste? That fruit and vegetable part in food patterns is maintained or increased?

This demands a new look at Fruit and Vegetables Processing to enhance its sustainability, i.e. decreasing losses and waste, inventing or identifying more sober processes, having a renewed look at fermentation and biopreservation, developing plant extracts to replace chemical additives, finding means to deal with different and more variably raw materials, ...

For this interdisciplinary research is needed, bridging the gaps between safety, quality, nutrition, production, consumer science and process engineering. Therefore this symposium will bring together these different aspects of research in the food science community, including academics, transfer organisation and R&D researcher of the fruit&veg processing industries.

The Symposium will consider the sustainability issues in the specific case of Fruit and Vegetables Processing, with particular focus on their specific research questions, linked to

- 1) New, sober processes that may be applied to stabilize fruit and vegetables while meeting consumer demands for "natural" foods;
- 2) their interest as sources of micronutriments, to questions on bioaccessibility of these same micronutrients;
- 3) The challenges due to intrinsic variability and fast evolution of the raw material;
- 4) The consumer interest, with disaffection in younger generations, with a fear of pesticide contamination.

Following the successful Fruit and Vegetables Processing symposium in 2011, it is now time to bring together the recent advances and identify the new challenges facing Fruit and Veg Processing, notably in terms of sustainability and adoption by the new generations.

Scientific and Organisation boards

The Symposium is organised by INRA and the University of Avignon, co-organisers : CTCPA and Optifel with support from Effost, Terralia and Agropolis.



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Health-beneficial and health-threatening compounds in organic apple juice depending on processing technology

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The demand for cloudy organic apple juice is increasing among health-conscious consumers in Europe. In several countries, rack-and-frame press (RFP) is traditionally used by small-scale apple farmers for juice production. Due to the slow process and exposure of mashed apples to the air, considerable amounts of ascorbic acid (AsA) and polyphenols are lost due to the oxidation. In order to make the processing faster, juice producers are implementing water press (WP) or belt press (BP). Little data is available discussing advantages and disadvantages of WP and BP in terms of juice quality.

The aim of the study was to evaluate the quality of cloudy organic apple juice processed by RFP, WP or BP in terms of sensory properties, content of health beneficial compounds (AsA, polyphenols and antioxidant capacity) as well as health-threatening compounds (mycotoxin patulin and main apple allergens).

'Cortland', 'Krista', 'Krameri tuviõun' and 'Talvenauding' apples grown in Estonian organic orchards were separately processed into juice by RFP, WP and BP. Juice was pasteurized at 85°C and packed into airtight 1.4-litre aluminium foil bags. Total soluble solids (TSS), titratable acidity (TA) and AsA content were determined from raw apples and from juice. Antioxidant capacity was determined from lyophilized apples and from juice; other quality parameters were determined only from juice.

For identification and quantification of polyphenols (chlorogenic acid, catechin, epicatechin, procyanidin B2, quercetin-3-D-galactoside, quercetin-3-D-glucoside, quercitrin, rutin and phloridzin), Shimadzu Nexera X2 LCMS-8040 system with electrospray ionisation was used. Patulin content was determined by HPLC. Descriptive sensory analysis was carried out by the trained sensory panel at the Aarhus University. The main apple allergens (Mal d 1 homologs) were determined at the Technische Universität München by using ELISA test. The antioxidant capacity measurements were performed by electron paramagnetic resonance approach at the CREA, IAA, Milan.

Patulin content was below detection limit (<4 µg/L) in all processed juices. Significant differences in juice quality were caused by cultivar properties and also by pressing methods. Juice processed from 'Cortland' apples had higher TSS/TA compared to other cultivars irrespectively of the pressing method, resulting the sweetest juice. AsA content was best retained in 'Krista' juice. As an average of pressing methods, highest content of chlorogenic acid, epicatechin and procyanidin B2 was retained in BP juices and the highest content of quercetin-3-D-glycoside and -galactoside and quercitrin in WP juices. The loss of most polyphenolic compounds was greatest in RFP juices.

Keywords: rack press, belt press, water press, polyphenols, quality

Acknowledgements: The FaVOR-DeNonDe project consortium acknowledges the financial support by CORE Organic Plus and Estonian Ministry of Rural Affairs