

Fruit & Veg Processing

2nd Euro-Mediterranean Symposium



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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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Fate of the main quality, nutraceutical and taste active compounds in conventional and organic tomatoes (*Solanum lycopersicum* L.) subjected to different drying techniques

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Tomato is well known for its large content in healthy compounds and it is widely used in the food processing industry. Drying is a very popular way to process tomatoes, also in small scale plants or as home-made technique. Processing can lead to positive modifications of the main quality and sensorial characteristics, however it can have a detrimental effect on nutraceutical compounds, affecting phytochemicals differently. In order to evaluate the fate of these compounds, fruits of a commercial variety ("Perbruzzo") and a local variety ("Saab-CRA"), from conventional and organic cultivations, were subjected to two drying techniques, one conventional in forced-air oven (OD samples), and one innovative in a miniaturized plant (<http://mieri.entecra.it>) utilizing solar irradiance (SD samples). Both kind of samples were compared to control freeze-dried (FD) samples. Sugars, organic acids, vitamin C and polyphenols were quantified by HPLC, while total carotenoids were determined by spectrophotometer. Selective extractions monitored by TLC analysis were performed in order to detect amino acids or small peptides (the putative taste-active compounds), whose identification is currently ongoing. The main sugars, i.e. glucose and fructose, decreased after drying, with a better retention in SD (60%) than in OD (5%) compared to FD. "Saab-CRA" showed a lower sugar loss with respect to "Perbruzzo". In OD samples, fructose was much more preserved than glucose (62% and 41%, respectively). Compared to FD, the organic acid content decreased in OD but not in SD. However the solar drying had a significant effect on the organic acid composition, since citric acid was reduced by 60% as expected, vitamin C was strongly depleted after drying, while carotenoids were well retained or increased in SD (+48%). Quercetin-derivatives appeared partially preserved in dried samples, particularly in OD (88% of retention compared to 50% in SD). Interestingly, in SD "Perbruzzo" maintained quercetins better than "Saab-CRA" (64% vs 36%), while in OD a greater retention was found in organic (99%) with respect to conventional (67%) samples. Naringenin-chalcone completely disappeared after both drying, while 5-hydroxymethyl-furfural, a marker of thermal process, appeared only in OD. These results highlight that compounds may be differently affected by the type of drying, as sugars and carotenoids are better preserved in SD, whereas quercetins are largely retained in OD. Consequently, the choice of the appropriate processing can be a key factor in preserving certain classes of quality or nutraceutical compounds.

Keywords: processing, small scale plants, quality changes, phytochemicals

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