



Newsletter No. 57

The time for raising our glass to toast with wine obtained with grapes treated by PEF is approaching

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The 18th General Assembly of the International Organisation of Vine and Wine (OIV) held on 26 November 2020 in Paris approved the use of the PEF technology in the production process of red and white wine. In the last years, this application of PEF technology has been investigated by researchers of different countries (Austria, France, Germany, Italy, New Zealand, Spain), demonstrating the benefits of PEF in different grape varieties. More than 50 papers and documents have been published on the topic so far.

The OIV is a technical and scientific intergovernmental organisation which aims to inform, assist, harmonise, standardise, and support the oenological sector. The OIV is currently comprised of 47 member states across five continents. These countries are responsible for 85 % of global production and 80 % of the consumption of wine in the world. To achieve its goals, the OIV works through a network of over 1,000 experts from around the world. All final decisions of the OIV are made via the consensus of the OIV member states.

The effects of PEF present an answer to some of the wineries' most important current demands, such as the improvement of energy efficiency and sustainability. Red winemaking requires a stage called maceration-fermentation in which the solid parts of the grape berries remain in contact with the fermenting must for several (7-10) days. In this stage, that represents the stage with the highest requirements in terms of energy and manpower during red winemaking, polyphenols that are mainly located in the grape skins release to the fermenting must. Polyphenols are responsible for the sensory properties (colour, flavour, astringency, and bitterness) and aging behaviour of red wine, but also of the beneficial effects for health attributed to the moderate consumption of wine.

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The electroporation of the grape skins increases the extraction rate of phenolic compounds during the maceration-fermentation step resulting in energy savings and higher production capacity of the wineries without the need to invest in the acquisition of new maceration- fermentation tanks.

In the case of white wine, wineries can also take advantage of PEF to improve the extraction of varietal aroma precursors that are located in the skin of some white grape berries. This attractive effect may prevent the use of macerating enzymes and/or save energy by shortening the duration of cold maceration in the production of white wine.

The process for the approval of the PEF technology began in 2018 at the request of the Spanish delegation with support of the French delegation. The results were presented to the experts of the OIV by the researchers of the University of Zaragoza (Spain) and of the L'institut Français de la Vigne et du Vin V'Innopôle to overcome the 8 stages that require the adoption of a Resolution.

PEF can be regarded as a technology with several uses for wineries in view of its ability to improve different operations conducted therein. The capability of PEF to inactivate spoilage microorganisms while preserving physicochemical and sensorial properties of must and wines may help enhance wine quality by guaranteeing reproducible fermentations and reducing or replacing the use of SO₂ for wine stabilization. On the other hand, It has been also demonstrated that PEF triggers yeast autolysis, thereby accelerating the release of mannoproteins from cell walls and decreasing the duration of aging on lees. Due to the interest of these applications for the wineries, the process for its approval by the OIV started in 2020.

The acceptance of the PEF technology by the OIV along with the current availability of commercial PEF units capable of responding to the processing capacity demanded by the wineries constitute solid arguments for a rapid implementation of the technology in the wineries.

Forthcoming events

7th School on Pulsed Electric Field Applications in Food and Biotechnology

Zaragoza, May 31 – June 2, 2021

<https://pefschool2021.electroporation.net>

4th World Congress on Electroporation and Pulsed Electric Fields in Biology, Medicine, and Food & Environmental Technologies

Copenhagen, September 19 – 23, 2021

<https://wc2021.electroporation.net>

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Wine obtained from PEF-treated grapes.

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