

Integration of PEF in food processing for improving food quality, safety and competitiveness

FieldFOOD newsletter no. 4

March 2018

Welcome to the fourth FieldFOOD newsletter!

The aim of newsletter is to provide regularly with a brief update of the progress of the FieldFOOD project. We hope that these newsletters serve as a valuable communication and reliable information platform to ensure that end users and beneficiaries of the PEF technology are fully aware and updated with respect to the advances of the project address to application of PEF to the food and drink industries.

FieldFOOD at the 2nd World Congress on Electroporation

FieldFOOD presented the main results obtained during the first two years of the project at the 2nd World Congress on Electroporation and Pulsed Electric Fields in Biology, Medicine and Food & Environmental Technologies.



The congress attracted 364 attendees from all over the world representing 32 countries and 5 continents. Seven presentations were giving by FieldFOOD partners in two special session on Monday 25th of September, covering an introduction to the project, the results from the pilot tests at the facilities of the industrial partners, the environmental impact and market opportunities.

Session 1

FieldFOOD: a H2020 innovation action for improving food processing by PEF

- **Introduction to FieldFOOD**, Javier Raso
- **On the integration of Pulsed Electric Fields technology in the tomato fruits processing**, Gianpiero Pataro
- **PEF assisted fruit juice preservation in FieldFOOD - Insights into industrial scale processing and optimization**, Matthias Schulz
- **Application of pulsed electric field in the apple juice/cider process**, Nigel Brunton



Coordinator FieldFOOD
Prof. Javier Raso
University of Zaragoza, Faculty of Veterinary Science, Spain
jraso@unizar.es



Dissemination manager
Dr. Jeroen Knol
European Federation of Food Science and Technology (EFFoST), The Netherlands
j.knol@effost.org

The FieldFOOD project

Until now the lack of industrial-scale equipment and the high costs have limited the commercial use of PEF technology in the food industry. The FieldFOOD project aims to develop flexible low-cost technology and methods. FieldFOOD started in April 2015 and lasts three years. Three universities, a research institute, a federation of food science and technology societies, a manufacturer of pulse power generators and several food processing companies are involved. You can find the results on our website and in our newsletters.



This project has received funding from the Horizon2020 Framework Programme of the European Union under grant agreement no. 635632





Session 2

FieldFOOD: a H2020 innovation action for improving food processing by PEF

- **Environmental impact assessment of the PEF technology incorporation in agri-food processing**, Victor Ferreira
- **PEF industrial equipment - modulators and transducers**, Duarte Rego
- **Market Opportunities and Consumer Acceptance of Foods Treated with Pulsed Electric Field**, Jeroen Knol

FieldFOOD annual meeting Berlin

On December 7 and 8, 2017, the FieldFOOD consortium gathered in Berlin at the Technical University of Berlin to discuss the current state of the project and the necessary decisions to realize the ambitions of FieldFOOD.

The project meeting focused mainly on the results of the last pilot tests with the PEF technology. The pilots took place in various product categories: tomatoes, olive oil, wine and fruit juices. The consortium partners active in these product categories presented the results of the PEF treatment which showed varying degrees of effectiveness.

The results obtained with tomatoes, showed that the application of a PEF treatment prior to the steam peeling reduced the energy input up to 28 %. Higher reductions were observed when less ripe tomatoes were treated in comparison with the more ripened tomatoes. In all the tomato varieties and maturity stages, the application of a PEF treatment improved the peeling.

The results of the application of PEF of this years pilot testing with olives, showed that the malaxation time can be reduced. Since the season was not over yet at the time of the meeting, the University of Zaragoza will perform more experiments to confirm these results.



Work packages

WP1 – Characterization of the raw material
University College Dublin,
Ireland
Nigel Brunton
nigel.brunton@ucd.ie

WP2– Process Design at Pilot Plant Scale
Technische Universität Berlin,
Germany
Cornelia Rauh
cornelia.rauh@tu-berlin.de

WP3– PEF Equipment Development
Energy Pulse Systems,
Portugal
Luis M. S. Redondo
luis.redondo@energypulsesystems.com

WP4– Integration of PEF in the Current Processing Lines
ProdAl scarl,
Italy
Giovanna Ferrari
gferrari@unisa.it

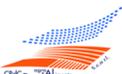
WP5– Industrial Validation
CIRCE,
Spain
name@fcirce.es

WP6– Dissemination, Technology Transfer and Communication
EFFoST,
The Netherlands
Jeroen Knol
j.knol@effost.org

WP7– Project Management
University of Zaragoza,
Spain
Javier Raso
jraso@unizar.es



This project has received funding from the Horizon2020 Framework Programme of the European Union under grant agreement no. 635632





FieldFOOD present at the 31st EFFoST International Conference

More than 100 attendants participated in the special session coordinated by three European projects (FieldFOOD, i3-food and HIPSTER) on innovative sustainable food processing within the 31st EFFoST International Conference held in Sitges (Spain) from November 14th to 16th.

Three FieldFOOD presentations were part of this special session:

- **A H2020 innovation action for demonstrating the viability of PEF in the food industry** (J. Raso, University of Zaragoza, Spain)
- **Application of pulsed electric fields technology in tomato fruits processing** (G. Ferrari, G. Pataro, N. Palo, University of Salerno, Italy)
- **Testing PEF in a winery for improving red winemaking** (I. Álvarez, University of Zaragoza, Spain)



It was a nice opportunity to listen the point of view from the three different projects working within new food technologies such as Pulsed Electric Field, High Pressure Thermal Sterilisation, and Low Shear Extrusion. At the end of the session there was nice dialogue and discussion with the audience in which the presenters, investors and project coordinators from 3 projects were able to answer the questions.

FieldFOOD juicing it up on Euronews

The 3- year EU project FieldFOOD has come to an end and media outlets are eager to share the results. Futuris, a Euronews programme that covers the leading scientific and technological research projects in Europe, reported on the FieldFOOD results.

They visited The Apple Farm in Cahir, Ireland, who had tested the portable, low cost PEF-technology in their apple cider and juice production line. They found that PEF can enhance juice extraction yield and increase shelf life through microbial inactivation. Euronews also visited the University of Zaragoza, where the PEF processes are being developed. The researchers at UNIZAR found that in wine-making, PEF-technology shortens the maceration time and enhances the extraction of the polyphenols and anthocyanins, resulting fruiter flavoured wines that are deeper in colour. The FieldFOOD project focused on developing equipment that is less expensive, to make the technology more accessible to food processing companies of all sizes. Professor Javier Raso from UNIZAR explains that there are also environment benefits, through reduced water and energy use, as well as benefits for consumers by having food products with improved sensory properties and increased nutritional value.

Video can be seen at <https://youtu.be/c32GbLVM1zM>

Scientific Advisory Board



Nuria Mª Arribas
Head of Research, Development and Innovation at FIAB and Secretary General at Spanish Technology Platform Food for Life



Dietrich Knorr
Emeritus Professor at the Department of Food Biotechnology and Food Process Engineering at the Technische Universität Berlin



Damijan Miklavcic
Professor at the Department of Biomedical Engineering at the University of Ljubljana



Brian McKenna
Emeritus Professor of Food Science at University College Dublin and Fellow International Academy of Food Science and Technology (IAFoST)



This project has received funding from the Horizon2020 Framework Programme of the European Union under grant agreement no. 635632



Universidad Zaragoza





A successful Anuga FoodTec for FieldFOOD

Anuga FoodTec was a very successful event for FieldFOOD, allowing the project partners to get together once more to speak about how the low-cost, flexible and portable Pulsed Electric Field (PEF) technology developed within the project can be easily implemented into existing processing lines.



The specifications of the PEF units make this technology more available for small and medium-sized enterprises, and food professionals from all over the world were very interested in testing the equipment in their own factories. Marcos Pereira and Duarte Rego, our project partners from Energy Pulse Systems addressed the questions from the visitors to our stand and demonstrated this mild processing technology. Visitors to the stand were also able to try red wine and olive oil prepared from PEF-treated Garnacha grapes and Arbequina olives. The increased extraction of polyphenols and anthocyanins from the grapes after PEF treatment gives the wine a much fruitier flavour and richer colour. PEF-treated olive also enhances the flavour and quality of the olive oil, having benefited from a reduced malaxation time.

The FieldFOOD stand was located in the Science Pavilion. This special section of Anuga was dedicated to universities, associations, and EU-projects focused on enhancing the application of scientific development in food industry. The Science Pavilion was the focal point of Science Day on Thursday 22 March, where recent developments in food science and technology were presented, including the outcomes of the FieldFOOD project as presented by the project coordinator Professor Javier Raso. FieldFOOD also had the opportunity to present their project results to a wider audience at the Speakers' Corners on Friday 23 March. Professor Giovanna Ferrari spoke about the advantages of PEF-technology specifically for the processing of tomatoes.

All sectors of the food and beverage industry were present at the Anuga FoodTec that is held every 3 years. This year, 1,479 exhibitors on 127.000 m2 exhibition space attracted approximately 46,000 visitors.



This project has received funding from the Horizon2020 Framework Programme of the European Union under grant agreement no. 635632

