CORE Organic Plus FP7-ERA-NET-618107
Ensuring quality and safety of organic food along the processing chain

**EcoBerries**

“Innovative and eco-sustainable processing and packaging for safe and high quality organic berry products with enhanced nutritional value”

http://coreorganicplus.org/research-projects/ecoberries/

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ECOBERRIES partners

- Chalmers University of Technology, Sweden
- NOFIMA, Norway
- UNIBO, University of Bologna, Italy
- USAMVB, University of Agronomic Science and Veterinary Medicine, Romania
- VTT, Technical Research Centre of Finland, Finland
- UMR-IATE, National Institute for Agricultural Research, France
- SP, Sweden
- GU/CRIFFC, Gaziantep University/Central Research Institute of Food and feed Control, Turkey

Kick-off meeting, Gothenburg; Sweden, February, 2015
Aim of the project:
To develop innovative, sustainable processing and packaging solutions to boost the manufacturing of organic berry products with high nutritional quality and low environmental impact.
Background

Sale of organic foods is one of the fastest growing market segments globally

✓ The number of foods made from organic raw materials is still limited

✓ Berries are very attractive for consumers in a variety of food products and snacks

✓ Berry production - an important agriculture and socio-economic opportunity for many European countries
Main activities

✓ Identify processing solutions to enhance the safety and overall quality and nutritional value of organic berries and products

✓ Use of innovative packaging technologies

✓ Adaption of traditional processing methods to organic requirements

✓ Development of new sustainable processing schemes

✓ Evaluate consumer perceptions

✓ Dissemination and knowledge transfer to relevant stakeholders
Schematic overview of the organisation of the work packages

WP1. Raw Materials
- VTT

WP2. Packaging & MAP
- UMR-IATE

WP3. Mild Drying technologies
- UNIBO

WP4. Added value products & ingredients
- SP

WP5. Shelf-life assessment and consumer studies
- USAMVB

WP6. Dissemination and technology transfer

WP7. Management
- Chalmers
WP1 activities

WP1 Characterization of cultivated berries

WP leader: VTT Ltd. Technical Research Centre of Finland
participants: Chalmers, Nofima

Objectives:
• Characterization of berries (strawberries, raspberries, black/red currant) from organic and conventional systems
• Evaluation of the impact of processing and storage on nutritional quality and safety aspects

Task 1.1: Chemical characterization (phenolic compounds, vitamins, etc.)

Task 1.2: Microbiological safety; comparison of differences in natural microbiota of the berries

Task 1.3: Bioactivity tests e.g. antioxidant activity and antimicrobial activity, in vitro accessibility.
**WP2 activities**

**WP2 New eco-efficient packaging solutions**

**WP leader:** UMR-IATE, National Institute for Agricultural Research  
**participants:** USAMVB; Nofima

**Objectives:**  
Identification of packaging solutions based in bio-sourced/biodegradable packaging material to extend the shelf-life of fresh berries and minimize waste.

**Task 2.1:** Literature studies to identify technologies to handle the berries before packaging to guarantee safety and quality of selected berries based on critical factors limiting shelf life.

**Task 2.2:** Determination of food packaging specifications for assessment of properties for packaging barriers, O2, CO2 and water vapour permeability.

**Task 2.3:** Identification of biodegradable packaging properties considering berry needs, cost, safety and environmental impact requirements and preferences of the stakeholders.
WP3 activities

WP3 Mild drying technologies for organic berries

**WP leader:** Univ. Bologna,

**participants:** SP, USAMVB, Gaziantep University (GU); GDAR / CRIFFC, Chalmers

**Objectives:**
Improvement of berry functionality by using organic pretreatments and processing at low temperature to maintain the nutritonal and sensorial properties. Application of mild technologies and intermediate drying processes to obtain semi-moist, osmotically treated and vacuum impregnated whole berries with high functionality and microwave dried extracts and powders with selected ingredients.

**Task 3.1:** Organic technologies for pretreatments to replace sulfites with natural compounds and to improve functionality of final semidried products

**Task 3.2:** Selection of organic technologies like mild concentration and drying technologies/direct formulation to enhance nutritional value of extracts and powders

**Task 3.3:** Organic technologies for dried berries. Validation of mild microwave/infrared technology according organic production requirements.

**Task 3.4:** Determination of mycotoxins in dried or semi-dry organic berry products, compared with conventional products. Assessment of the microbiological safety
WP4 activities

WP4 Added value berry preparations

**WP leader:** SP, Technical Research Institute of Sweden  
**participants:** UNIBO, VTT, Chalmers

**Objectives:**  
Evaluation of Innovative technologies to allow production of ingredients (purees with/without pieces) from berry raw materials and added-value berry products (snacks) by preserving the natural content of bioactive compounds while assuring safety, stability and bioaccessibility and low environmental impact.

**Task 4.1:** High pressure homogenization (extend product’s shelf-life and to modify mouth feel properties throughout the modulate change of the texture (viscosity) characteristics)

**Task 4.2:** Novel extrusion processing (short time, high shearing process, novel dry foods)

**Task 4.3:** 3D printing (mild shaping technology) will be applied to berry purees to produce innovative confectionary products without added sugar and high nutritional value.
WP5 activities

WP5 Shelf-life assessment, LCA and consumer studies

WP leader: USAMVB,
participants: Nofima, Chalmers, SP

Objectives:
Identify the most promising packaging solution by measuring different quality aspects, such as microbial spoilage, changes in colour, texture and nutritional content during storage experiments. Evaluation of consumer attitudes and preferences will be made to identify consumers' price sensitivity for berry products, together with the importance of organic and health claims associated with such products. Life Cycle assessment (LCA) studies will be made on selected products.

Task 5.1 Identification of relevant quality parameters
Task 5.2 Storage experiments using the identified parameters.
Task 5.3 Consumer acceptance/conjoint studies
Task 5.4 Environmental assessment studies
**WP5 activities**

**WP5 Shelf-life assessment, LCA and consumer studies**

**WP leader:** USAMVB,  
**participants:** Nofima, Chalmers, SP

<table>
<thead>
<tr>
<th>Task 5.1</th>
<th>Identification of relevant quality parameters</th>
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<tbody>
<tr>
<td>Task 5.2</td>
<td>Storage experiments using the identified parameters, including nutrients/phytochemicals. Storage experiments based on packaging solutions identified in WP2, one solution per product</td>
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<td>Task 5.3</td>
<td>Consumer acceptance/conjoint studies of berry products developed in WP3/WP4. The conjoint study will be conducted in Norway, Romania and Turkey, with a representative sample of at least 150 persons/country, allowing identifying consumer segments</td>
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<td>Task 5.4</td>
<td>Environmental assessment studies to compare environmental impact in the production of organic and conventional berry products</td>
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CONSUMPTION AND ATTITUDES REGARDING BERRIES-BASED PRODUCTS – COMPARATIVE ANALYSIS OF ROMANIA AND FRANCE

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Conclusions (I)

- The number of female participants was higher in Romania than in France.
- The French respondents were mostly young people, unemployed and single in comparison with Romania were the respondents were mostly young people, but employed and married.
- Both the Romanian and French respondents do their shopping once a week or more often, the favorite places for shopping the supermarkets and hypermarkets.
- Among the products based on berries listed in the questionnaire French prefer fresh berries, yogurt with berries and juice or smoothie with berries, while the Romanians prefer berries in jam, dried berries or in mixtures with breakfast cereals and yogurt.
The French and the Romanian groups who does not buy fresh berries products think that these products are perishable and are considered luxury and for them produce essentially the same benefits.

Both French and Romanian loyal consumers groups are aware and appreciates the sensory characteristics and nutrients content of these products and at the same time appreciate that these products may have benefits on health and help to maintain a healthy lifestyle.

Nearly all French consumers (approximately 94%) and Romanian majority of respondents (62%) participants in the survey consider the taste and naturalness of the product as the most important aspects when buying products based on berries.
Occasional fresh fruits buyers group, both French and Romanians, do their shopping once a week or less, but are still responsive and know the benefits of eating products based on berries but sometimes are influenced by price, income, convenience and accessibility.

One of the main conclusions is that market dynamics based berries products in Romania compared with one in France is still moderate and restrained by economic factors (income per person Romanian consumer significantly lower compared to average French consumer income per person in the EU).
WP6 Dissemination and technology transfer (All partners)

Objectives:
The information gained during the project will be integrated into concrete recommendations to allow the dissemination of knowledge across European research centres, breeders, farmers and (R&D) companies, during conferences, seminars and workshops and through publications in scientific journals and in trade journals.

Task 6.1 Provide stakeholder with project information through the website and leaflets

Task 6.2 Organize workshops

Task 6.3 Participate in international conferences and publish scientific papers

Task 6.4 Extension activities to reach farmers
Expected results and impacts

✓ Knowledge about the potential effects of production methods based on nutritional quality and safety aspects

✓ Identification of packaging solutions based on bio-sourced/biodegradable packaging material to extend the shelf-life

✓ Creation of new profitable value chains for organic berry products.

✓ Better cooperation between researchers, farmers, processing industries, commerce and consumer organizations
THANK YOU FOR YOUR ATTENTION
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