InProVe – Innovative Processing of Vegetables and Potato

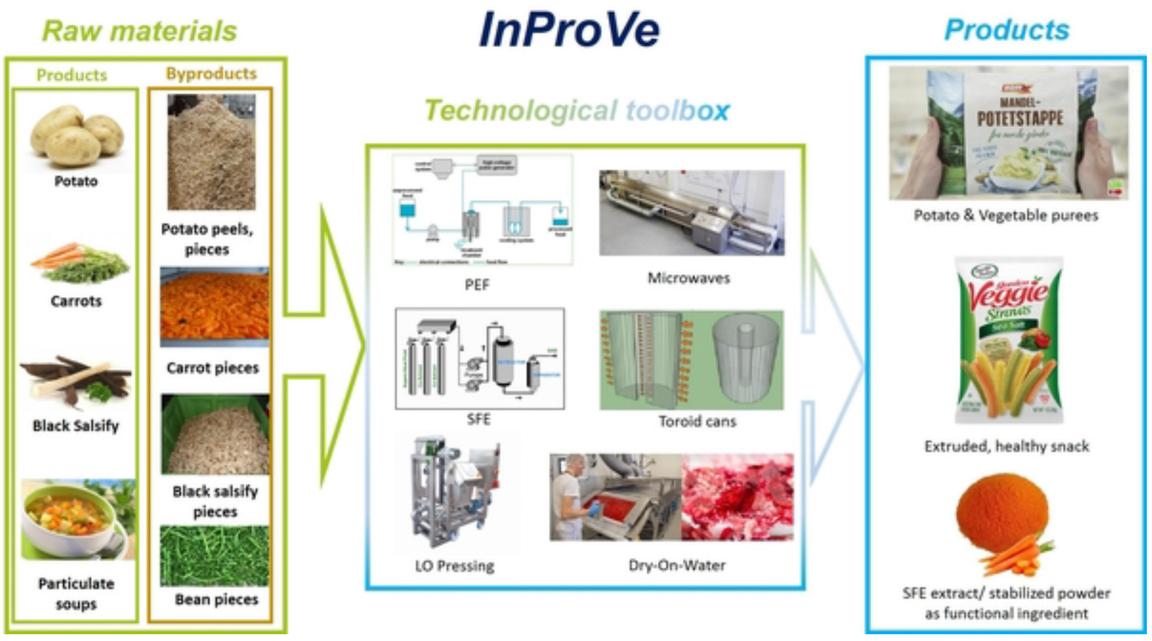
- Summary

The novel processing technologies, including **three types of Microwave Heating and Pulsed Electric Field (PEF)** will be utilized to demonstrate the potential to combine savings in energy and water consumption and improvement of sensorial and nutritional quality. Pre-treatment using PEF, and **Supercritical Fluid Extraction (SFE)** will add value to underutilized by-products and waste.

Innovative canning technology introducing modified can geometries will complement process design to further optimize energy efficiency.

Mathematical modelling and innovative process design will be used to optimize the conditions for the innovative processing technologies, with the aim to improve energy and cost efficiency. Modelling will also be used to predict how process design influences the kinetics of nutrient retention, functional properties of treated foods, and how they contribute towards desired properties and quality.

The project will increase consumers' access to safe, healthy and convenient food through novel energy efficient processing techniques and improve utilization of raw material, by-products and waste, for which valorisation strategies will be developed



Partners

For additional information , please see:

https://inproveproject.eu/

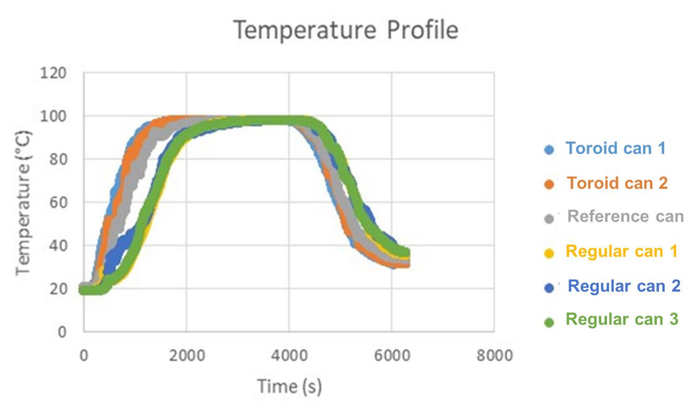
- Main objective

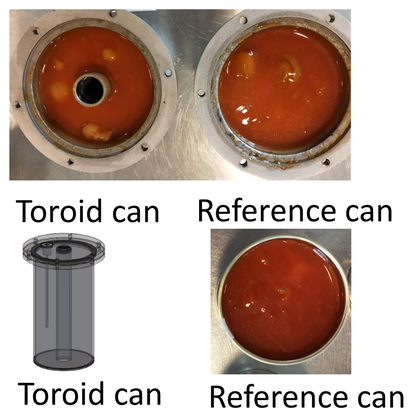
Improve the utilization of raw materials and derived by-products by using innovative processing technologies for the development of healthy ingredients and food products that are relevant for the current market (vegan, natural, plant-based, easy to use….)

- Preliminary Results

Banning canning is a misunderstanding

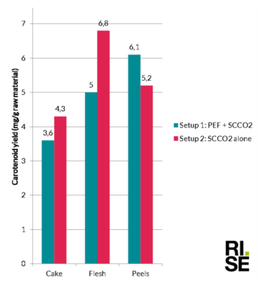
In canning heat transfer rate is mainly influenced by **container shape** & **product type**. Since convective heat transfer coefficient is assumed infinite, this leaves container geometry the only option to increase heat transfer rate and decrease process time for further quality improvement. A recent innovation is the use of **toroidal cans** for a significant heating rate increase for both solid and liquid food products.





Use of PFE and SC-CO_2 for extraction of phytochemicals

PEF was evaluated as pre-treatment before SC-CO2 extraction to recover carotenoids from carrot by-products. Follow-up experiments are planned with other by-products.

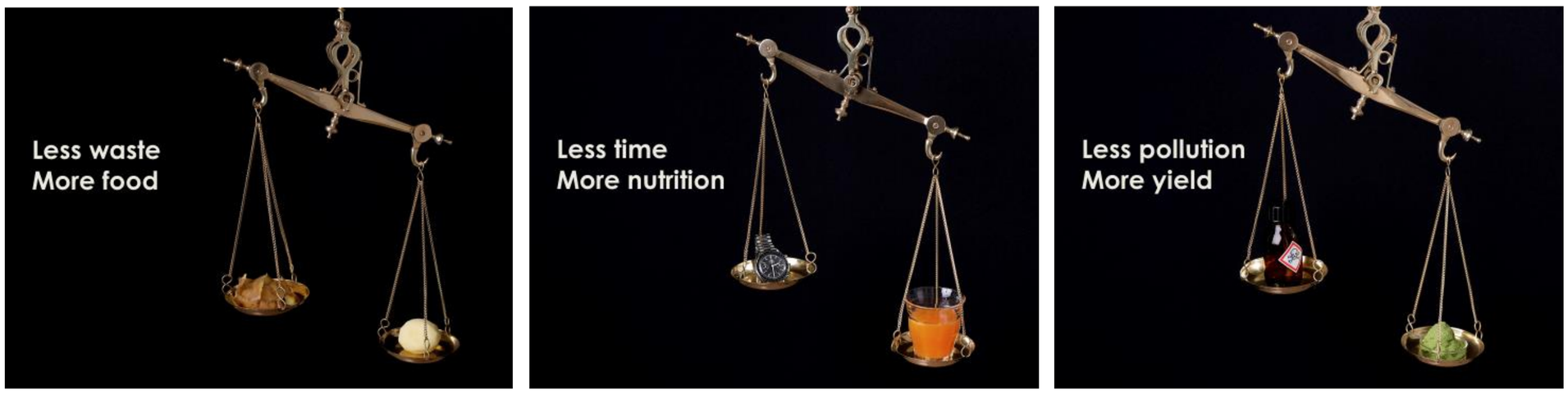


Use of HMEC for texturizing plant-derived ingredients

Protein-rich by-products will be evaluated as raw materials in a high-moisture extrusion cooking process

- Preliminary Conclusions/potential impact

- New technologies represent opportunities to create higher added value out of agrifood by-products in a sustainable way
- The advantage of **toroid cans** for heat treatment of canned food products is clear, but effect is dependent on food matrix. Collected data will be used in future modelling and kinetic studies of relevant macro- en micronutrients, bioactives
- **PEF & SC-CO_2** are useful 'green' technologies to extract valuable phytochemicals
- **HMEC** is a interesting technology to turn plant-based ingredients into 'meat-like' products



MEFPROC – Improving Sustainability in Food Processing using Moderate Electric Fields (MEF) for Process Intensification and Smart Processing

Summary

The MEFPROC consortium aims to use Moderate Electric Fields (MEF) in food processes to improve their sustainability, in terms of reduced environmental impact, increased competitiveness, intensified processing, energy efficiency, enhanced product safety/quality and waste valorization. In MEF assisted processes, the volumetric heating which arises from direct application of electrical energy significantly reduces heating times at minimized energy and optimal temperatures compared with conventional heating. MEF processing combined with ultrasound (US) can further enhance mass transfer in extraction and impregnation processes.

The consortium consists of leading European researchers in electro-processing and US, MEF and US equipment manufacturers and also food manufacturers. All RPO partners in this consortium have chosen applications based on their background and experience and the interests of their 'partner' food manufacturers and collaborating equipment manufacturers. MEFPROC is designed to bridge gaps in scientific and technical knowledge between these stakeholders.

The project uses an innovative technology development strategy ('innovation hubs') to stimulate the uptake of MEF by the food industry. Consultations, trials and developments will take place with food manufacturers, RPOs and equipment manufacturers working together in a 'hands on' fashion. This will focus and prioritize potential MEF applications, identifying viable areas where the technology can be commercially applied in the food sector. The application of MEF (or US assisted MEF) on different food processing operations (blanching, cooking, pasteurization, extraction, impregnation) is the focus. In the first half of the project, partners have been working on developing, realizing and testing new MEF (and US assisted MEF) systems within their laboratories. The cross disciplinary and inter institutional collaboration is working well with knowledge and equipment sharing, personnel interchange and transfer of results between WPs evident already despite the delay in funding for most partners in the consortium.

Preliminary Conclusions

- MEF is a 'green processing' technology with significant commercial potential in the future of food processing.
- Further research is necessary to optimize the processing conditions for the food systems/applications under investigation.
- Advanced modelling and control will be central to commercial uptake of MEF technology.
- More research is needed to understand the decision-making processes of managers regarding technology uptake and consumer acceptance of products produced by new processing technologies.

Main Objectives

- To demonstrate MEF (or US assisted MEF) efficacy in food processing and waste valorization
- To develop new more efficient and sustainable MEF processes
- To increase awareness of MEF in the food manufacturing sector and to combine RPO, Equipment and Food Manufacturing expertise to assess MEF processes in commercial context

Preliminary Results

- MEF systems have been designed, realised (Fig 1) and tested for heat and mass transfer. A US transducer compatible with use in MEF fields for combined MEF/US application has been designed (Fig 2) and is undergoing validation.
- Products tested to date include roccula, meat, heterogenous meat/potato mixtures, fruit mashes and root vegetables.
- Results show significant potential for process intensification including improved energy efficiency and product quality (e.g. improved freezing tolerance with up to 65% survival rates vs 0% following a conventional freeze/thaw cycle). The process conditions employed fall well within the MEF domain (20 V/cm, 5 Hz, 2000 ms) which are readily realizable in a commercial setting. MEF produced identical survival rates to a more capital-intensive PEF process (Fig 3).
- MEF increased juice yield (up to 18%) for medium to coarse fruit mashes due to a high degree of cell disintegration. MEF was less effective for fine mashes, where significant disintegration had been induced mechanically (Fig 4).
- MEF has been explored for fast re-heating of heterogenous meat/potato mixtures, (Fig 5) demonstrating the potential to attain uniform heating thereby addressing the age old concern regarding "where is the cold spot?".
- Preliminary results for meat suggest comparible quality to conventional products but with MEF significantly reducing time to target temperature and energy consumption.
- A Simulink model of an MEF heating process has been developed and validated (Fig 6), with advanced PID, Fuzzy Logic and Artificial Nerual Network controllers is under development.
- UA are utilising a behavioural economics model to guide the technical and economic judgements by food manufacturers and consumers regarding the adoption and acceptance of the novel MEF processes. An economic lab experiment (Fig 7) indicated that the opportunity to communicate helps firms to adopt innovative technology significantly earlier when there are few firms but has no effect when there are a larger number of firms.

Fig 1. 3 kW MEF systems and Cells (UCD)

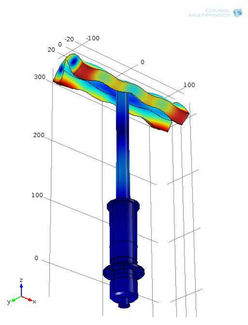


Fig 2. Design of US transducer (UPV)

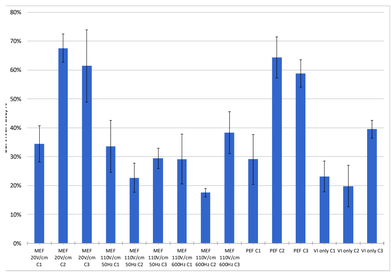


Fig 3. Survival after 5 min of thawing of Rucola leaves using: 20 V/cm, 50 Hz, 2000 ms (UL)

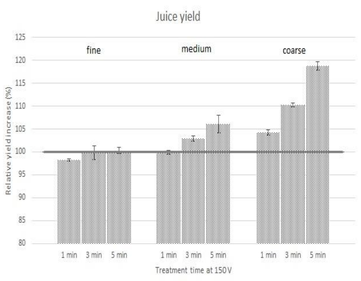


Fig 4. Juice yield from fine, medium and course fruit mashes using 150 V (TUB)

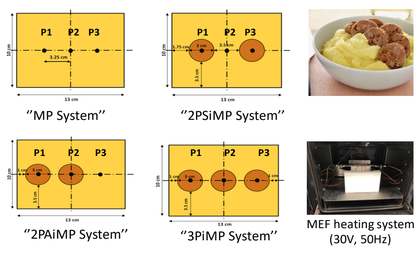


Fig 5. System arrangements for MEF heating of heterogeneous meat/potato (USal)

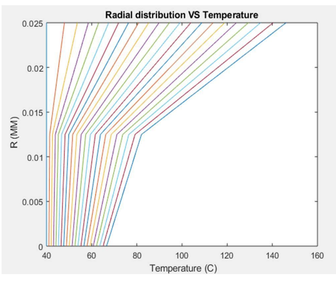


Fig 6. Simulink Model radial Temperature Profile (SHU)

Fig 7. Creed experimental economics laboratory (UA)

Topic 1: **Innovation in food processing technologies and products**

Sustainable Food Platforms:

Enabling sustainable food practices through socio-technical innovation

PLATEFORMS

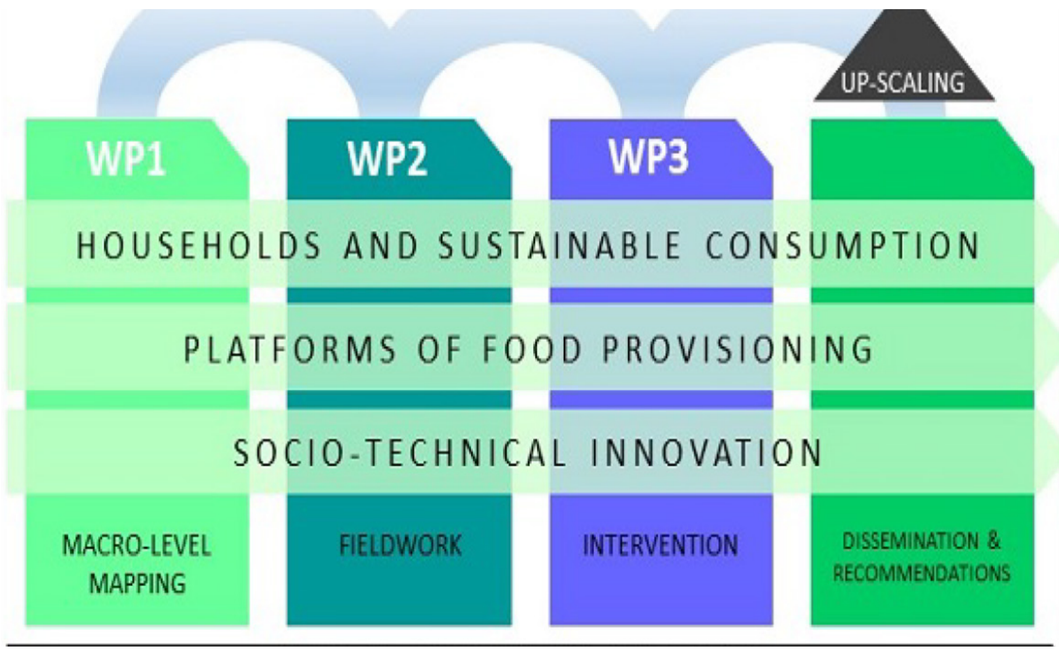
Summary

WP 1: Mapping platforms in the five countries (Norway, Italy, Germany, Ireland, Sweden)
Desk-top approach.

WP 2: Kitchenscape ethnography. Ethnographic interviews and observations of households: 40 households in each country (200 households in total).

WP 3: Household intervention. Exploring the experience of new users. Online experiment.

WP 4: Implement a change in platforms communicating with relevant business and policy makers.



Research questions

— How and to what extent do environmental factors interact with sustainable consumer choices and practices?
— How do food supply systems (supermarkets, online shopping etc) interact with sustainable household practices?
— Can the spread of online food platforms promote sustainability on a larger scale?

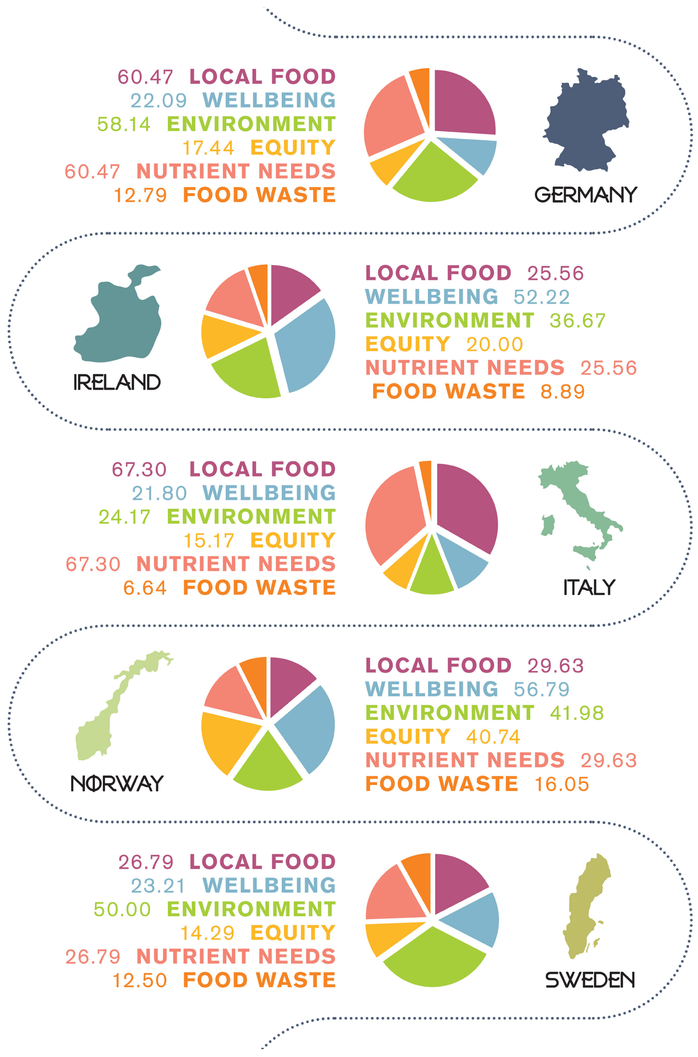
Our findings so far

— The percentage of online food shopping users is very different across the five countries.

— The rise of online food platforms is slower than for other businesses.

— People choose online shopping instead of physical shops because it is more convenient and in order to save time.

— Consumers tend to transfer their consumption practices from physical shops to online retail platforms.

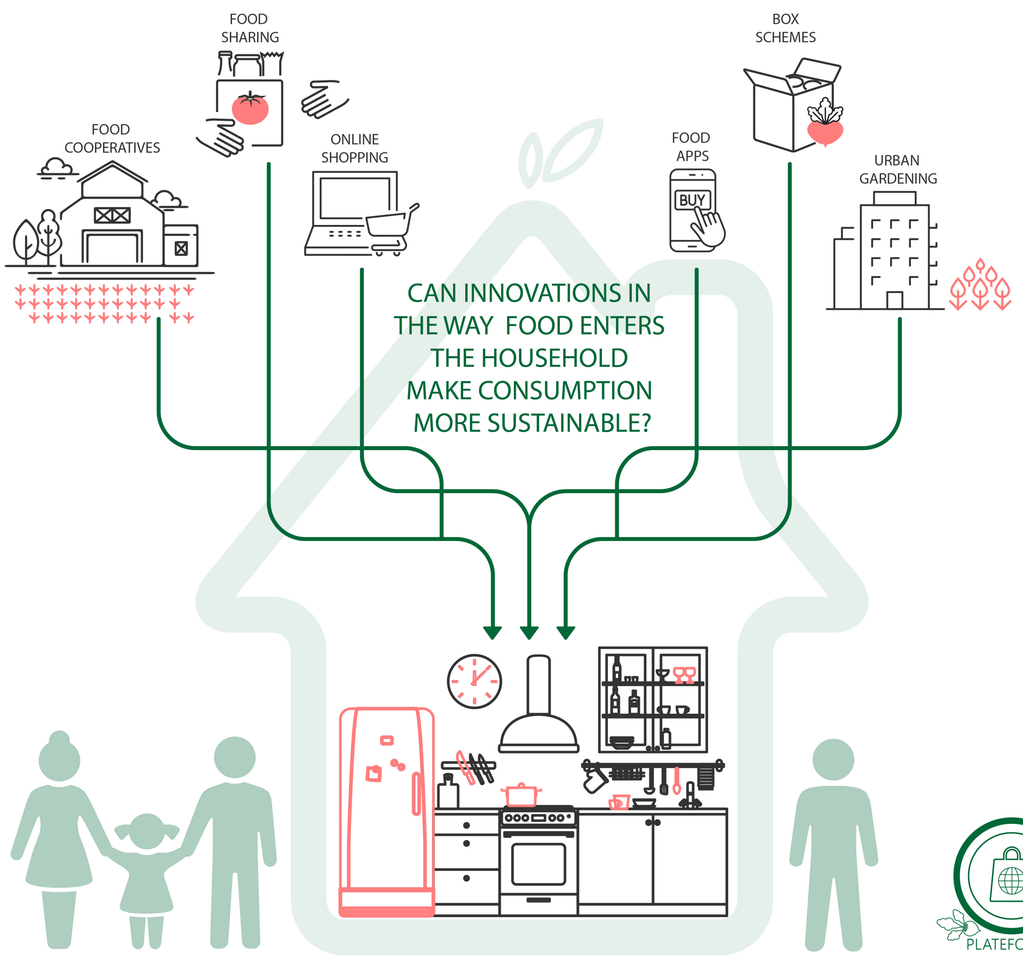


Why sustainable food practices matter

1: Consumption in all its phases of planning, provisioning, storing, cooking, eating, and disposing – driven by practices more than by individual choices.

2: Providing new insights on which factors engage the consumer in the transition to new sustainable food practices.

3: By suggesting technological and social interventions of high acceptability among stakeholders that promote sustainability.



OSLO METROPOLITAN UNIVERSITY
CONSUMPTION RESEARCH NORWAY SIFO

Topic 3: Understanding consumer behavior and food choice

FUNBREW– Biotransformation of brewers' spent grain: increased functionality for novel food applications

Summary

With more than 30 million tons annually produced worldwide, brewers´ spent grain (BSG) accounts for 85% of the total by-products generated by the beer industry. BSG has a very good nutritional quality but up to date, its main destination is as animal feed. The project goal is to transform BSG into a valuable ingredient for the food industry. Bioprocessing (controlled fermentation and enzymatic treatment) is a feasible technology to improve BSG technological quality. The target are cereal-based food (baked goods, pasta and breakfast cereals) widely consumed every day in our diets.

Main objective

BSG is rich in nutrients but does not have a good performance when used in food as such. Funbrew mission is to study feasible bioprocessing options to enable the use of BSG as food ingredient with improved technological and nutritional attributes.

Results

Fermentation with selected lactic acid bacteria and the use of xylanase altered BSG structure and positively modified the:

-rheological properties (synthesis of dextran);

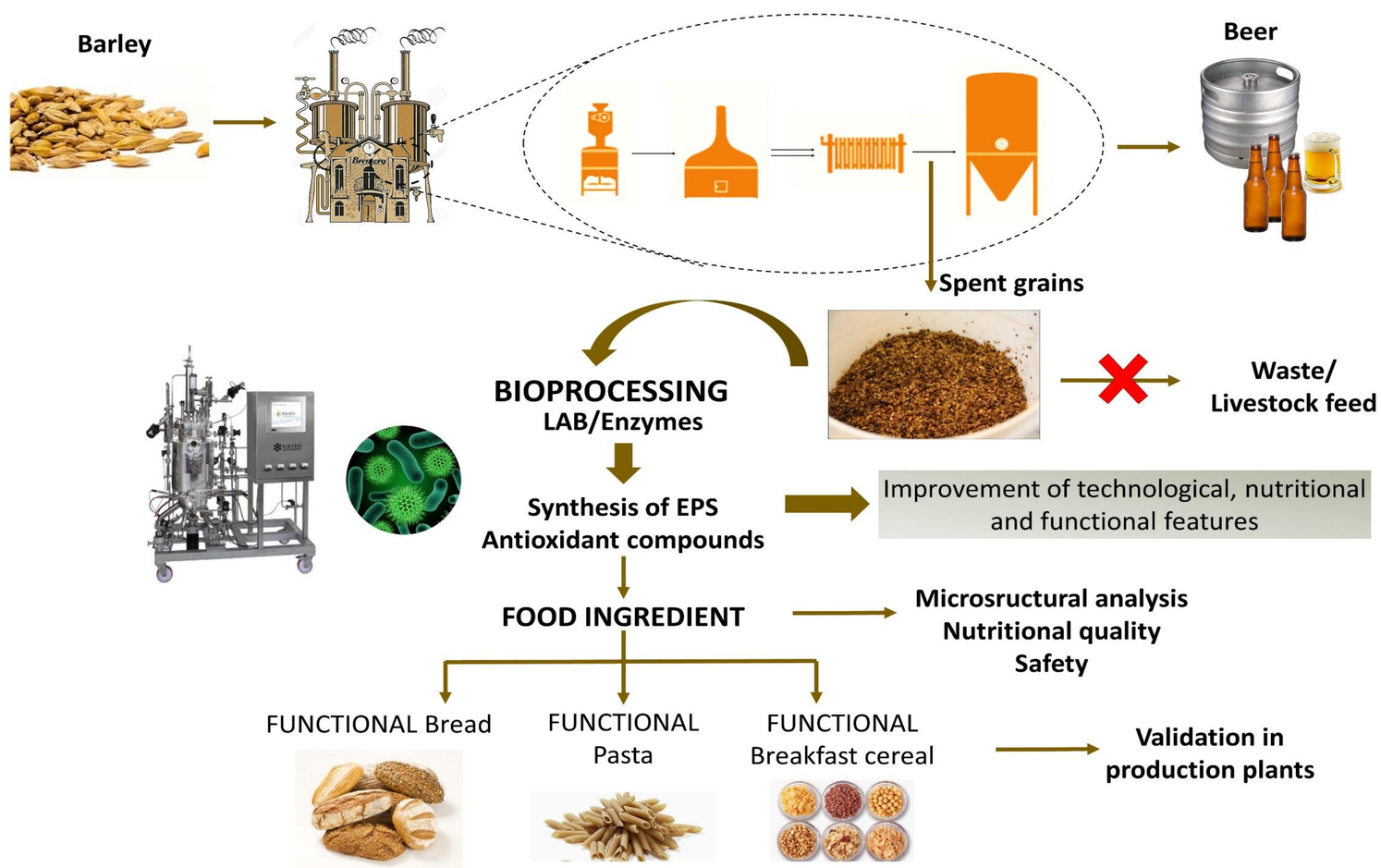
-nutritional/functional properties (increase of the antioxidant activities);

-overall safety and reproducibility.

Potential impact

Selected processing conditions allowed to increase BSG nutritional and technological functionality, enabling its use as ingredient in food production. With simple processing steps, technological and sensory problems related to BSG characteristics could be overcome, adding value to BSG. As consequence, food products like bread pasta or breakfast cereal enriched in bioprocessed BSG, will allow the consumer an higher intake of fiber, antioxidants and other beneficial compounds. Through BSG valorization, the potential of breweries side-streams could be maximized, enabling the development of more sustainable food systems.

The Funbrew project:

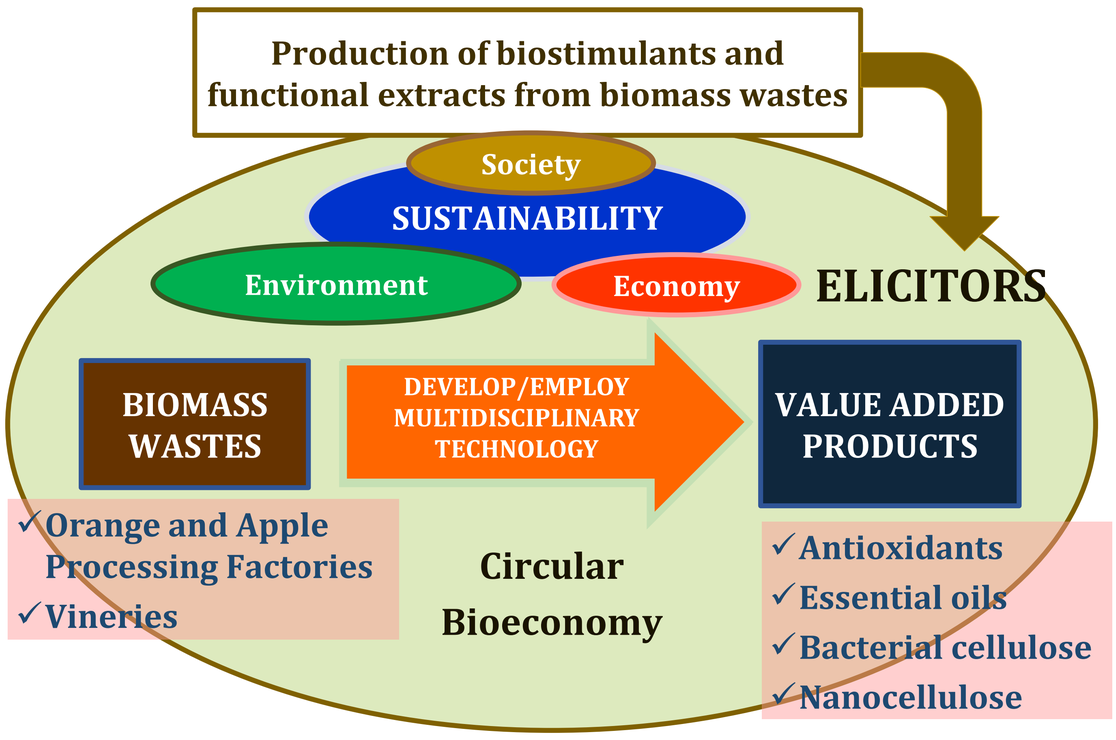


Topic 1: **Innovation in food processing technologies and products**

SPAREC

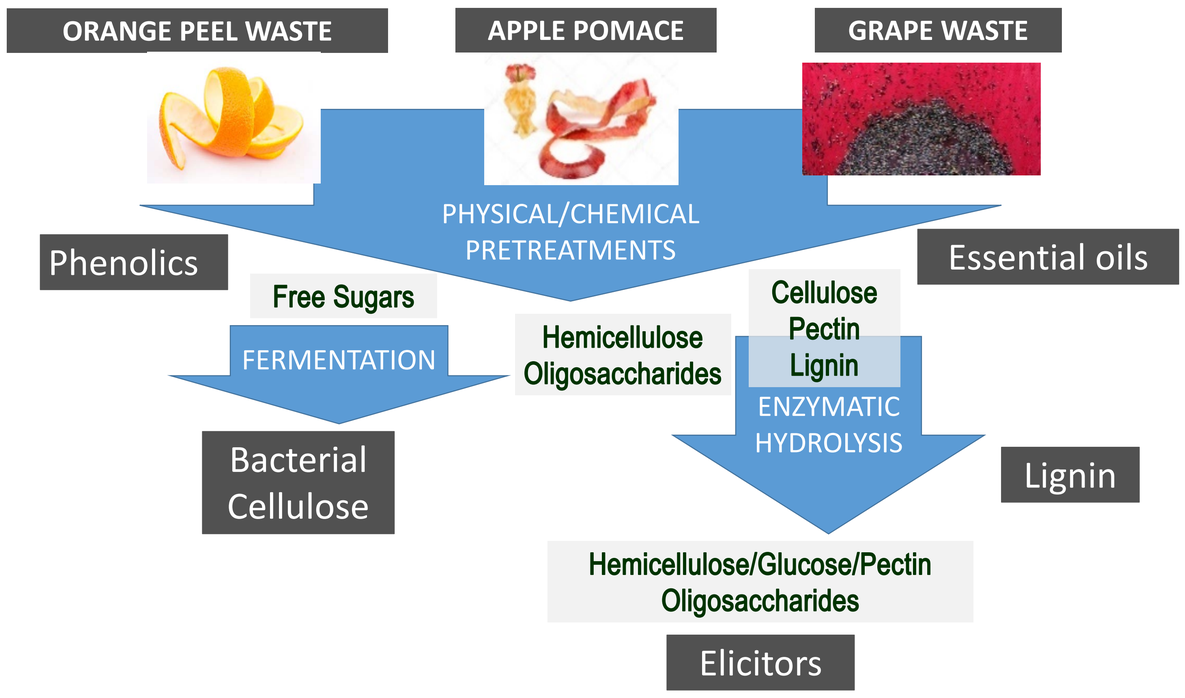
Sustainable Processing of Agrofood Residues to Elicitors and Chemicals

Summary



Is it possible to obtain functional extracts and substitutes for pesticides from food-related biomass waste by sustainable processes?

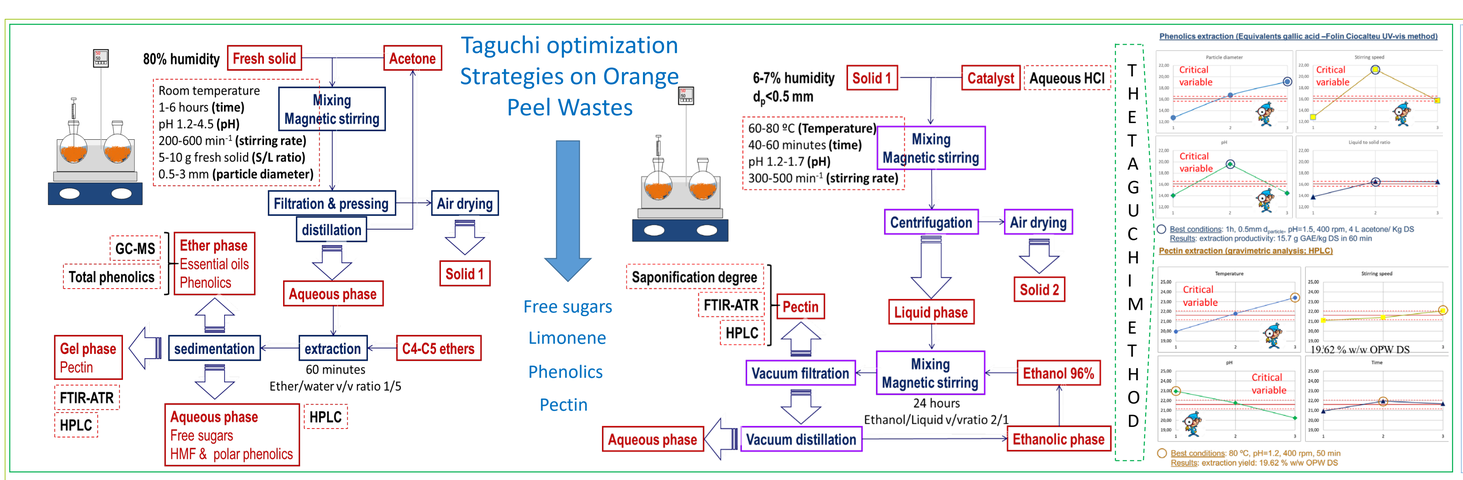
Preliminary results



- ✓ Chemical characterization of orange and apple wastes
- ✓ Protocol for free sugars, essential oils and phenolics extraction from wastes: Taguchi optimization
- ✓ Chemical pectin extraction from orange peels
- ✓ Chromatographic fractionation and production of medium-size pectin oligosaccharides
- ✓ Endopectinases cloned in *Pichia pastoris*: first productions
- ✓ Preliminary positive plant responses (depending on the waste and the sample)
- ✓ Bacterial/Nano-cellulose for controlled release
- ✓ LCA/LCC : from uni- to multiproduct/multiprocess

Preliminary Conclusions

- ✓ **NREL proximal analysis suggests support uses for lignocellulosic-rich wastes** (→nanocelluloses)
- ✓ **Extractions** (acetone and water/ethanol) **from more to less polar components**
- ✓ **Essential oils extraction: stirring speed is the critical variable**
- ✓ **Phenolics extraction: pH, stirring speed and particle diameters as critical variables**
- ✓ **Pectin extraction. pH and temperature are the critical variables**
- ✓ **OPW and grape peel&lees for antioxidant extracts**
- ✓ **Orange and apple enzymatic hydrolysates show promising elicitor activity**
- ✓ **Nanocellulose permits a progressive release of salicylic acid (as model elicitor)**

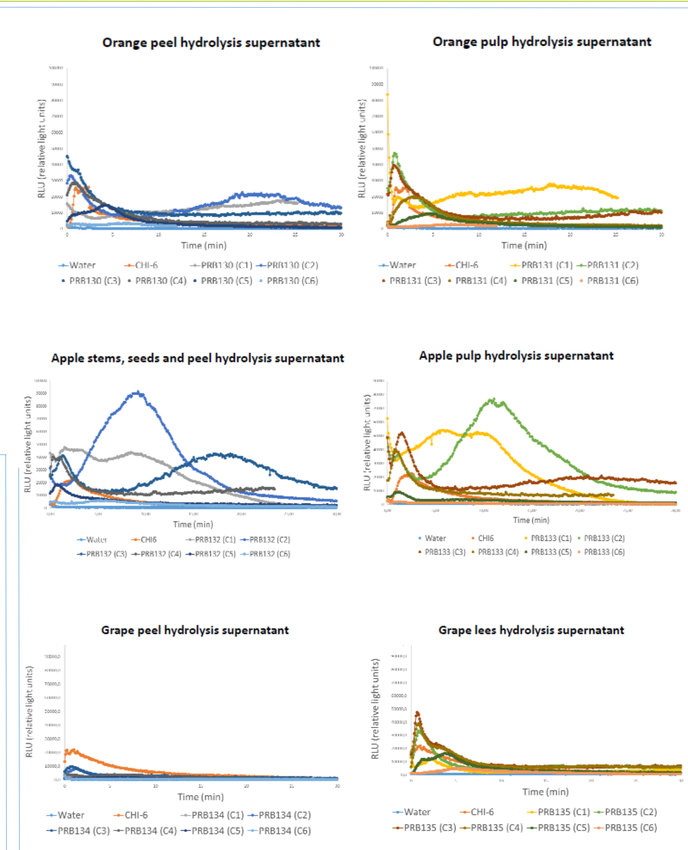


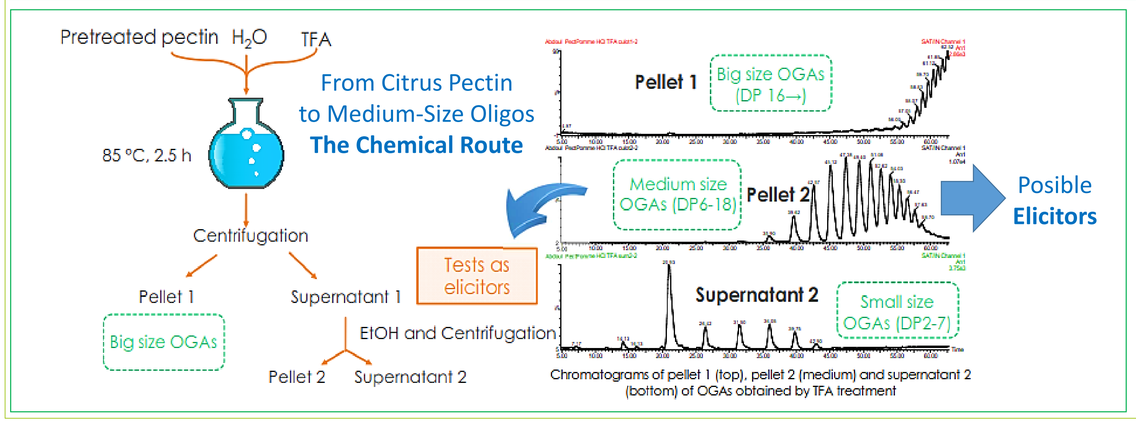
Eliciting calcium responses in plants with enzymatic hydrolysates from wastes

Dose-response study for each sample

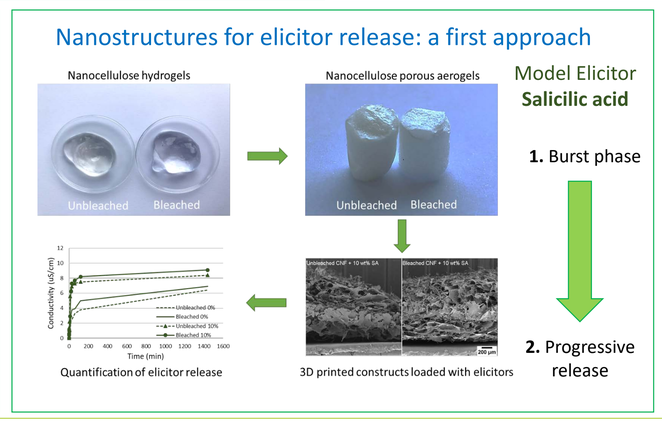
Code	Final Concentration	%
C1	1/3	33,3
C2	1/10	10
C3	1/30	3,3
C4	1/100	1
C5	1/300	0,3
C6	1/1000	0,1

PRB130 PRB131 — Experiment 1 (orange)
PRB132 PRB133 — Experiment 2 (apple)
PRB134 PRB135 — Experiment 3 (wine)





Chromatograms of pellet 1 (top), pellet 2 (medium) and supernatant 2 (bottom) of OGAs obtained by TFA treatment



Topic 2: Providing added value, increased resource efficiency and reduction of waste in sustainable food systems

SUSFOOD2

Extraction and characterization of BIOactives and CARBohydrates from seaweeds and seagrasses FOR FOOD-related applications

BIOCARB -4-FOOD

SUMMARY

- In the BIOCARB-4-food project, we are exploring, environmentally friendly and efficient extraction techniques (US, Mw, enzymes and their combinations), combined with the exploitation of the remaining biomass, rich in bioactive compounds, to sequentially obtain novel carbohydrate-based extracts and fibers (nanocellulose) from seaweeds and seagrasses. The extracts are characterized and a life cycle assessment (LCA) will also be conducted for proving the sustainability of the procedures.

OBJECTIVES

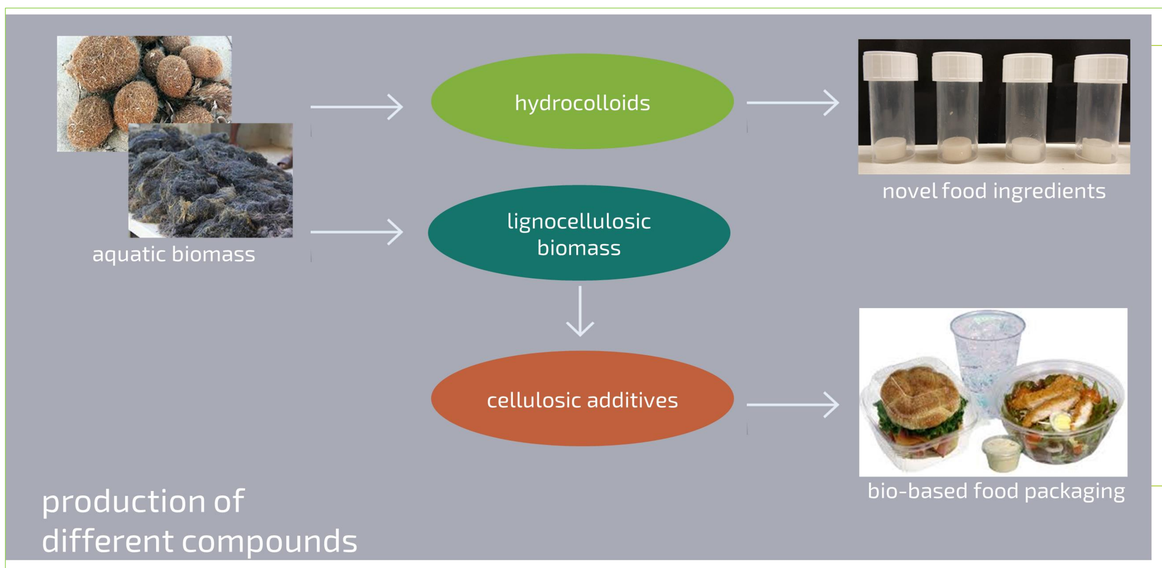
- The project is expected to contribute to improved process efficiency and development of high added value ingredients from seaweeds and seagrasses which can positively impact in the competitiveness of companies at EU scale by a better valorization of raw materials.

PRELIMINARY RESULTS

- Improved yields and interesting functional properties of seaweed and seagrass extracts are being obtained. Biodegradable packaging structures are also being developed from the residuals left, thus encouraging further research in this topic.

PRELIMINARY CONCLUSIONS

- Novel extraction techniques and simplified extraction procedures can be used for obtaining phycocolloid extracts useful for food applications.
- The seaweed residuals left after phycocolloid extraction can be valorized for developing packaging structures and additives
- The residuals of the seagrass *Posidonia oceanica* have demonstrated to be an excellent biomass source for obtaining lignocellulosic fractions of interest in the development of biodegradable food packages.



Topic 1: **Innovation in food processing technologies and products**

SUSFOOD2

AVARE

Adding value in resource effective food systems (AVARE)

SUMMARY

Food waste reduction and re-utilization of organic materials as a resource is still lacking impetus in many sectors and countries

AVARE project focuses on

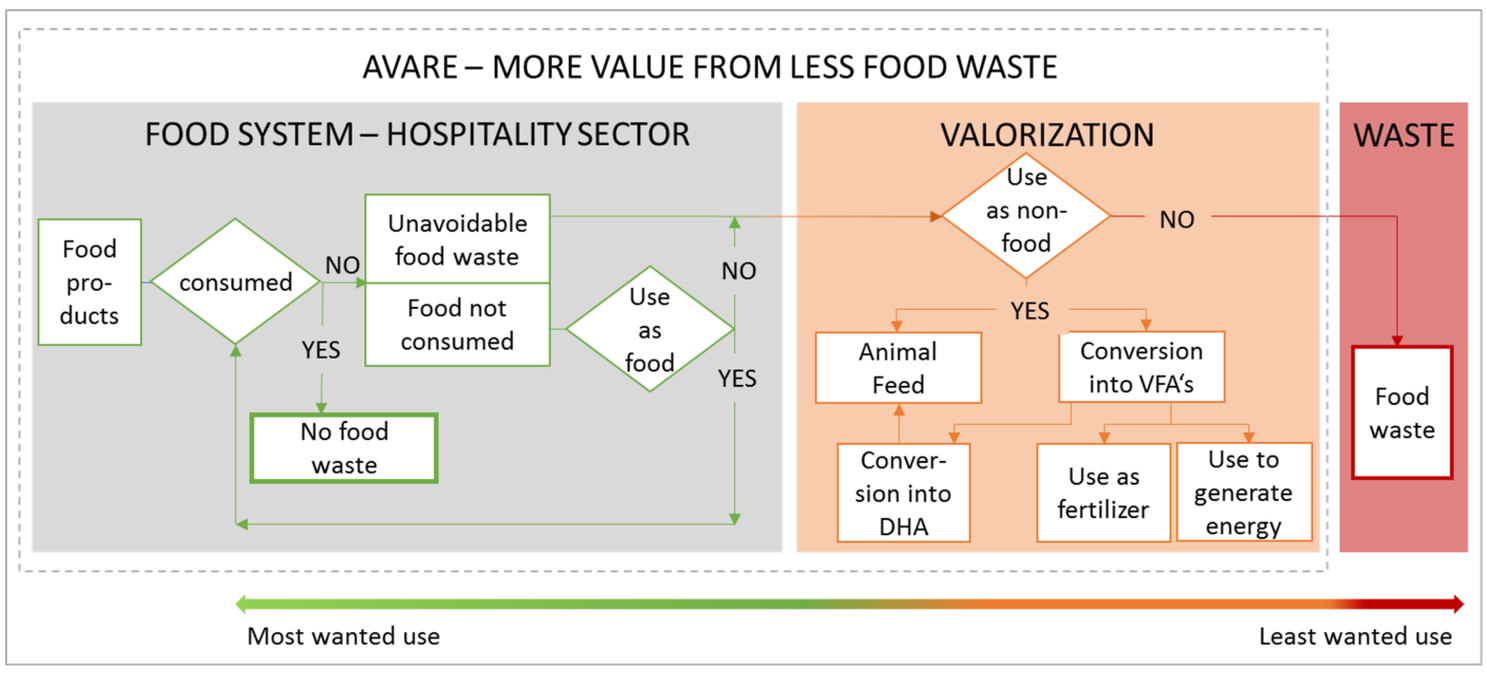
- Identification of best practices for food waste prevention
- Valorization of food waste as valuable products
- Sustainability assessment of measures
- Stakeholder dialogues

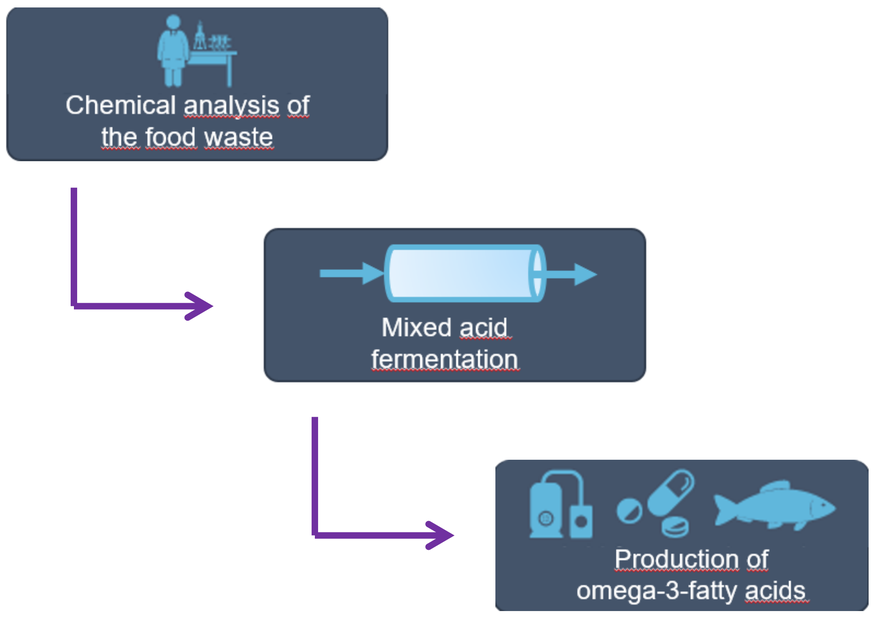
Partners	
LUKE - Natural resources Institute Finland, Finland	Luke
University of Applied Science Münster - Institute of Sustainable Nutrition, Germany	iSuN, FH MÜNSTER
Technische Universität Berlin Institute of Biotechnology, Germany	Technische Universität Berlin, Institute of Biotechnology
Ostfoldforskning - Ostfold Research, Norway	Østfoldforskning
Swedish University of Agricultural Sciences, Sweden	SLU

Funding Organisations	
Ministry of Agriculture and Forestry, Finland	mmm.fi MINISTRY OF AGRICULTURE AND FORESTRY
Federal Ministry of Food and Agriculture, Germany	Gefördert durch: Bundesministerium für Ernährung und Landwirtschaft, ptble, aufgrund eines Beschlusses des Deutschen Bundestages
The Research Council of Norway, Norway	With funding from The Research Council of Norway
Formas - The Swedish Research Council, Sweden	FORMAS

Objectives

- Supporting the EU-level target to reduce food waste by 50% by 2030
- Improving the quality and value of separately collected food and food waste
- Addressing food waste as a renewable resource, supporting the business based waste-to-value technology
- Quantifying and evaluating the financial, environment and social impacts of the proposed actions
- Facilitating competitive edge of European researchers institutions, SMEs and policy makers in addressing the societal challenge of food waste reduction, recycling and reuse





Impacts

- Attitudes of consumers and society towards more efficient use of raw materials and resources
- Improvement of the effectiveness of processing techniques, waste reduction and acceleration of the transition to bioeconomy
- Creation of intervention strategies to reduce waste in the food chain and re-use components to the benefit of industry, policy makers and end-users
- The greater consumer knowledge and understanding on food chain and waste reduction

Topic 2: Providing added value, increased resource efficiency and reduction of waste in sustainable food systems

This transnational project is part of the ERA-Net SUSFOOD2 with funding provided by national/regional sources and co-funding by the European Union´s Horizon 2020 research and innovation programme.

SUSFOOD2

Disaggregation of conventional vegetable press cakes by novel techniques to receive new products and to increase the yield

Summary

Background:

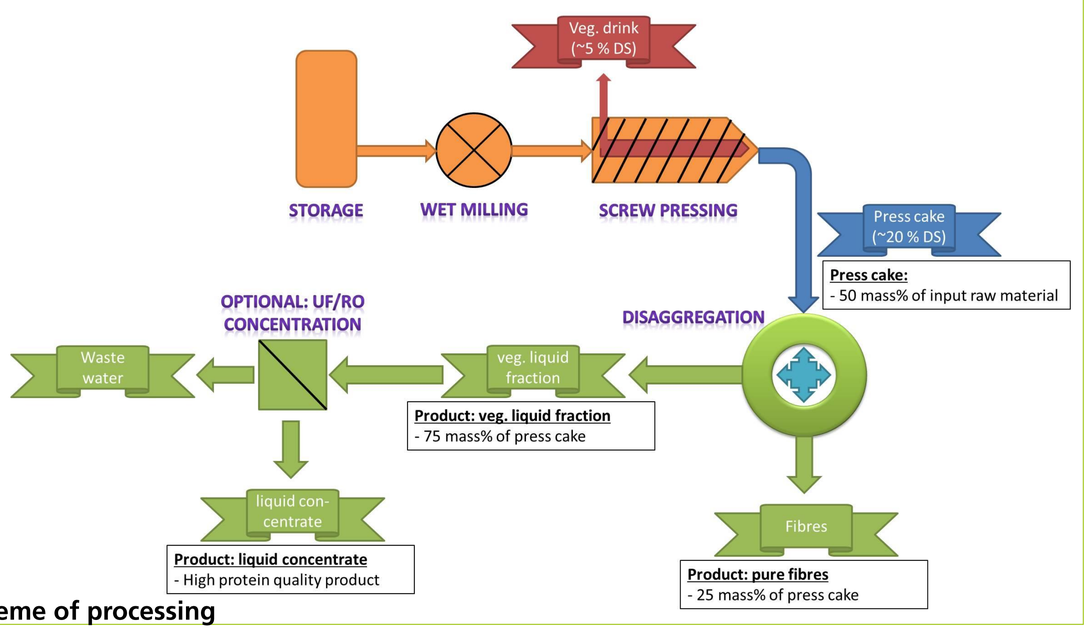
- Vegetal drinks from soy, oat, rice, almond and coconut gain a wide popularity and the market for these beverages is enormously growing
- Within the conventional processing a press cake remains which is only used as feed. However, the content of proteins and other high quality nutrients is still very high
- DISCOVERY aims at unlocking these potentials to increase the yield, efficiency and sustainability within food processing

Work packages:

- Disaggregation of press cakes by a new high-power ultrasound device that induces acoustic cavitation
- Utilization of product streams by separation, enzymatic treatment and concentration steps
- Evaluation of nutritional quality and food safety

Project partners:

- UNIMI: Dep. of Pharmaceutical Science, University of Milan, Italy
- KTU: Food Science and Technology, Kaunas University, Lithuania
- UMSICHT: Fraunhofer Institute for Environmental Tech., Germany
- Berief: Berief Food GmbH, Germany



Scheme of processing

Main objectives / research questions

Utilization of high quality nutrients in press cakes:

- Soy okara and other press cakes still contain a high amount of proteins up to 25 % (dry substance) and additional valuable ingredients.[1)]

Novel high-power ultrasound technology:

- New high-power ultrasound device with oscillation amplitudes up to 60 µm
- Acoustic cavitation disintegrates vegetable cell structures of press cakes making an extraction of the containing proteins possible

Separation and concentration:

- Liquid phase with high amount of proteins for beverages and yogurt / tofu production
- Fiber fraction for meat analogues or bakery products

Enzymatic treatment:

- Disaggregation of press cakes and treatment of liquid and solid fraction

→ What are the optimum process parameters to disintegrate the press cakes?
→ How does the ultrasonic treatment effect nutritional quality and food safety?
→ Can the process be applied to increase the yield in food production?

Sources: 1) B. Li et al.: "Isolation and Structural Characterisation of Okara Polysaccharides", (2012) Molecules 17(1), p. 753-761

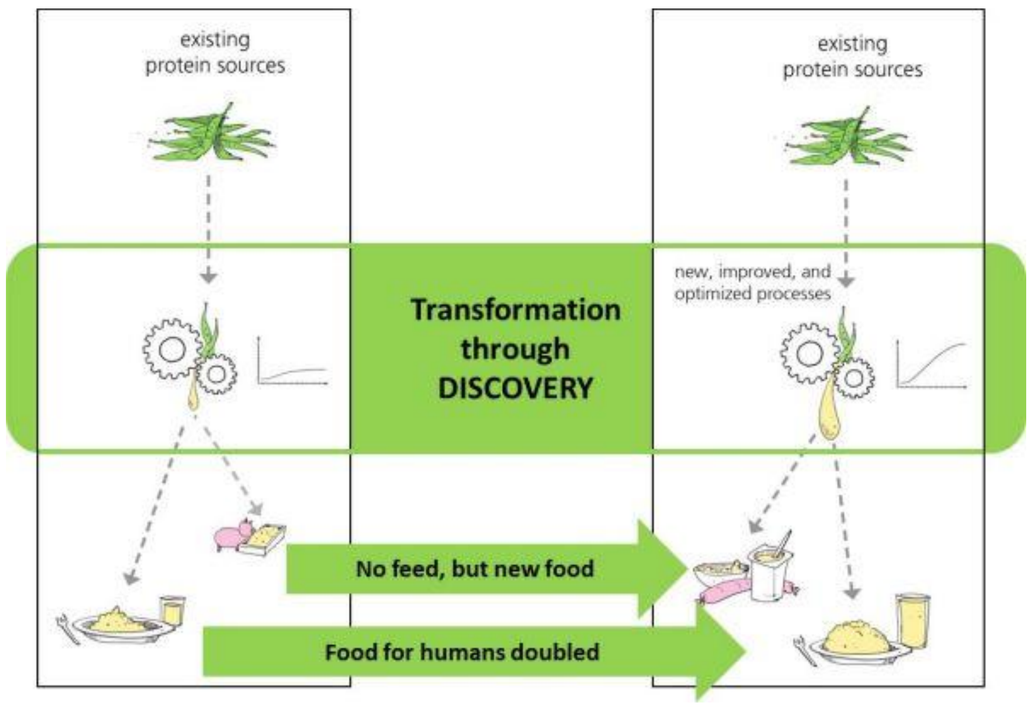
Preliminary results

- High-power ultrasound treatment (18 kHz, 4.5 kW, 60 µm) can disrupt vegetable cell structures and thus makes protein extraction possible
- For soy okara, optimum process parameters concerning temperature (60 °C), treatment time (2 min), batch size (5 L), power input (4.5 kW) and dry matter content have been identified and will be confirmed in the following work
- Enzyme selection for press cake treatment based on solubilization, fermentable sugar formation and protein recovery
- Optimal ratios of enzymes (amylase, cellulose / xylanase, protease, carbohydrase) and optimal hydrolysis temperatures and times were identified for different press cakes
- Methods for characterization of food quality have been identified and applied: Ultrasound treatment shows effects on protein content in liquid fraction; total amount of proteins is increased and the SH-free content is reduced possibly indicating changes in secondary and tertiary structure

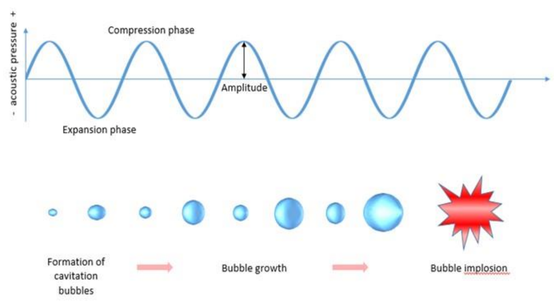
Preliminary conclusions / potential impact

- Experimental results for soy okara show that high-power ultrasound is effectively disaggregating vegetable cell structures; transformation from batch to continuous treatment and further processing by concentration will follow
- Process parameters to be confirmed and adapted on further press cakes (oat, rice, almond, coconut, etc.)
- Enzyme treatment and / or use of fiber fraction for meat analogues show good potential
- Results concerning food quality and safety underline the feasibility of the process

→ Process improved and optimized within DISCOVERY can lead to an increase of protein yield in human food production
→ Food processing will become more efficient, economic and sustainable



Insights in experiments



Effects of high-power ultrasound induce acoustic cavitation and lead to cell disruption

Ultrasound treatment of vegetal press cakes to increase protein yield

Before and after ultrasound treatment:
Soy okara with water

Separation into liquid and solid fraction

Topic 1: **Innovation in food processing technologies and products**

ImPrOVE
Innovative (pre)POmace Valorization procEss

Summary

- ImPrOVE addresses a wide agro-related problem: pomace resulting from the fruit processing.
- aims to fully valorize pomace by using a combination of existing and innovative processes.
- total valorization is achieved in 3 clusters: (1) pretreatment giving raise to aromas and oil from separated seeds; (2) extraction of high value materials from the pretreated pomace and (3) valorization of the resulting fibers, either directly (functionally designed fibers) or by splitting cellulose-lignin and valorizing both materials physically, enzymatically and/or chemically.
- use alternative solvents like bio-based Ionic Liquids (BIOIls) and natural deep eutectic solvents (NADESs) for the extraction of HPV and fibers like cellulose and lignin.

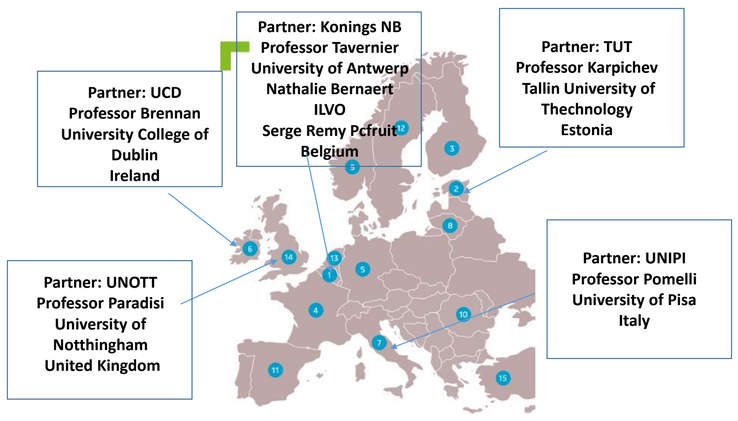


FIG. 1 Partners involved in the ImPrOVE project.

Main objective

- to develop and validate a safe and robust multi-stage strategy to fully valorize fruit pomaces, focusing principally on aroma capture (WP2), oil and high-added value products (HVP) extraction (WP3 and WP4) and fibrous fraction recovery and transformation (WP6 and WP7).
- sustainability aspects: use of BIOILs and NADESs for the extraction of oil, HV compounds, and lignin and cellulose from the pomaces.
- assessment of the potential uses of the obtained products and materials (WP5), evaluating their applicability in food and/or in cosmetic industry.

Preliminary Results

- DESs and ILs were synthesized in UNIPI and biodegradability tests were performed in TUT.
- The synthesized DESs and ILs were screened in the extraction of polyphenols from 2 types of apple pomaces and 2 types of olives pomaces. Pcfruit had selected the more promising apple types.
- Extracts obtained by classical extraction methods and with DES/ILs from two types of apple pomaces (Jonagold and Bitter sweet mix) and 2 types of olive pomaces were characterized by HPLC.
- The extracts were send to UCD for further analysis.
- The solid residue were send to UNOTT for further analysis.

Preliminary Conclusions

- Both NADESs and BIOILs were tested from the biodegradable point of view by TUT and all passed the test of biodegradability (the most promising DESs are those based on ChCl and levulinic acid or ethylene glycol) and inherently biodegradable Cholinium Oxalate (53 %).
- Apple pomaces were obtained from ILVO and Konings.
- The NADES based on cholinium chloride and polyols and organic acids were used in the extraction of polyphenols from apple pomaces (Bitter Sweet Mix and Jonagold) and two types of olives. Some of the common polyphenols were identified: procyanidin B2, chlorogenic acid, phlorizin (apples pomaces) and tyrosol, hydroxy tyrosol, oleuropein and luteolin (olives pomace). Even though, 30 polyphenols standards were employed in the identification of the polyphenols present in the extracts, full identification is still ongoing.
- The extracts obtained by classical methods and with NADES were sent to UCD and, for some extracts, the antioxidant capacity was revealed.

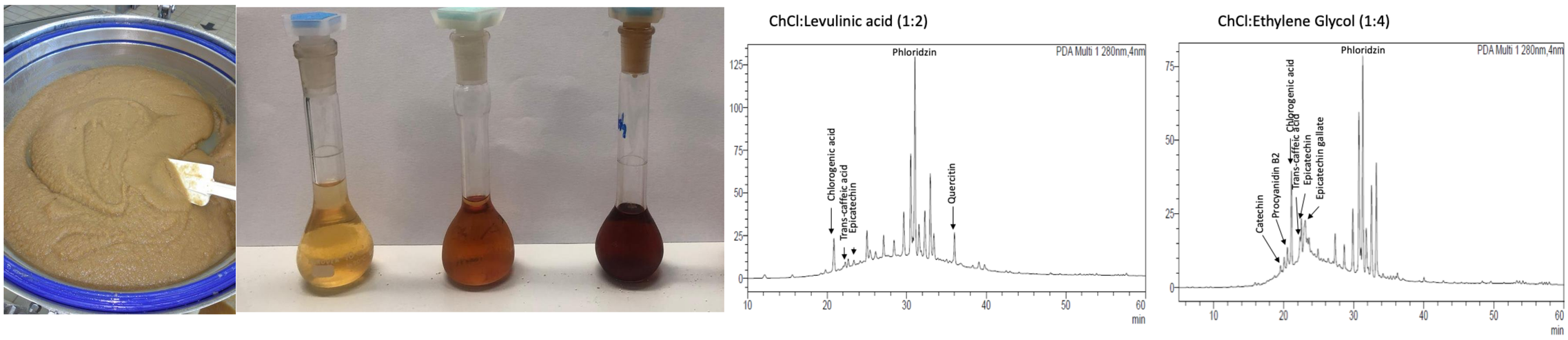


FIG. 2 From left to right: fruit pomace, pomace extracts, HPLC of two samples extracted with different DESs.

Topic 1: Innovation in food processing technologies and products.
Topic 2: **Providing added value, increased resource efficiency and reduction of waste in sustainable food systems.**
Topic 3: Understanding consumer behavior and food choice.

PROSEAFOOD

Innovative processing of seaweed for novel, healthy food products and ingredients

Summary

- Utilization of Norwegian cultivated brown algae (S. latissima, A. esculenta) for novel processed food ingredients
- Development of processing technology using thermal-chemical and enzymatic treatment, and microbial fermentation to increase nutrients and introduce novel sensory properties
- Development and technological characterization of novel food prototypes containing processed brown algae
- Control of food safety and characterization of potential positive impacts on gut health

The consortium

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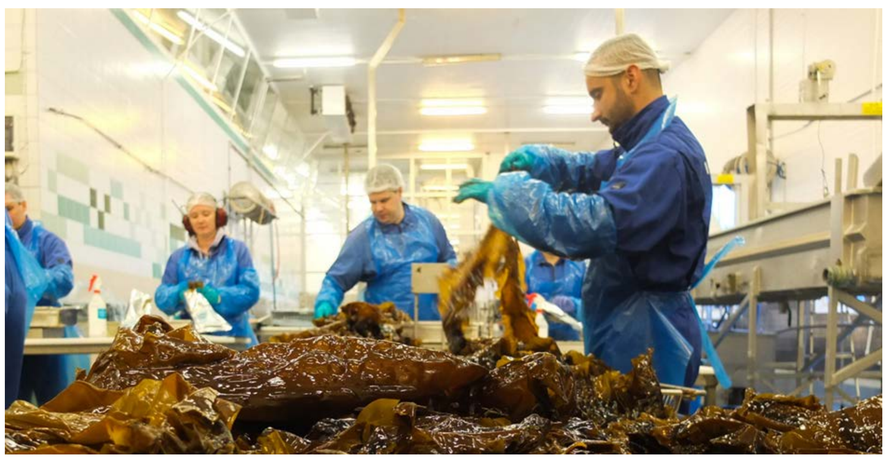
Main objective

Agricultural food production faces large technological and environmental challenges to remain sustainable, highlighting a need for new food sources and alternative production sites. Brown seaweeds are important as food in East Asia, but presently underutilized in the Western world. Large-scale, sustainable cultivation is now increasing the availability of high-quality seaweed biomass in Europe. However, for brown seaweed to become a widespread food ingredient, improved processing methods to increase the edibility and nutritional value of both new and existing products are required.

The primary objective of the "ProSeaFood" project is to apply advanced processing methods to increase the digestibility and nutrient availability of brown seaweeds. This will be achieved through employing enzymes and fermentation to increase nutritional availability and remove inedible or potentially harmful substances, and to introduce novel sensory properties. Based on the processed ingredients, the project will further develop innovative food products that are nutritious, tasteful and have well-documented effects on consumer health.

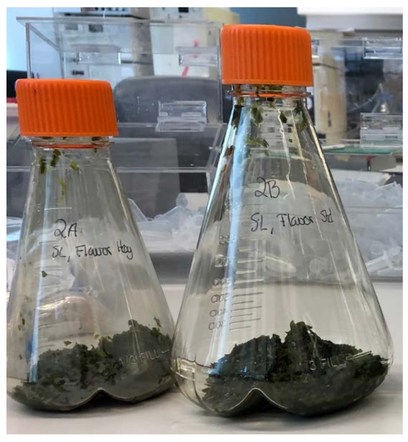
@ProSeaFood1 @proseafood_project



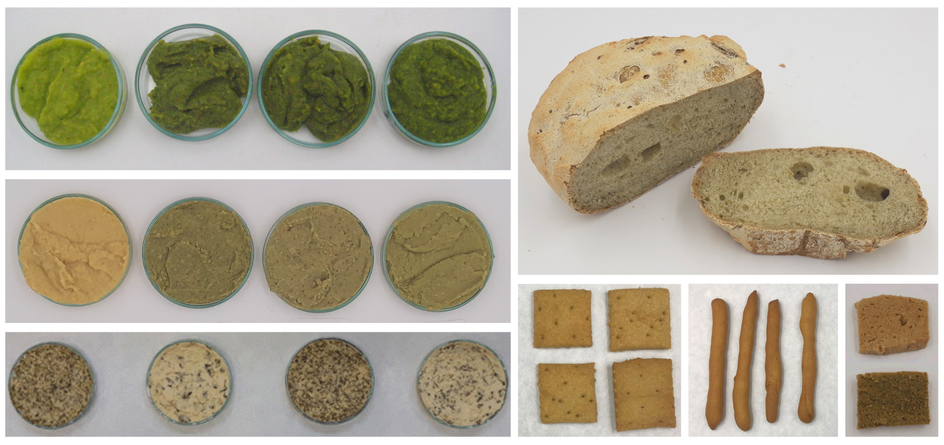
Preliminary results

- Iodine and salt removal achieved in pilot-scale processing
- Initital effects of pre-treatments (drying, freezing, heating) on sensorial properties as seaweed as an ingredient
- Partial saccharification of structural polysaccharides with food-grade enzymes for sensorial modification and to enhance fermentative processes
- Screening of probiotic bacteria growing on native and enzyme-released seaweed components
- Sensorial and technological characterization of multiple prototypes incorporating seaweed at various stages of processing


Potential impact

Successful implementation of the project will contribute toward widespread implementation of brown algae in European food products, by introducing ingredients with enhanced nutritional and sensorial properties, reduced contents of unwanted compounds, and documented effects on gut health. Furthermore, the project will contribute key knowledge and methodology on sustainable pilot- to industry-scale processing of brown algae for adaptation by stakeholder industries.



Topic 1: **Innovation in food processing technologies and products**

suschoice
• sustainable growth • •

Università di Verona
Western Norway University of Applied Sciences
Geisenheim University
The Bucharest University of Economic Studies

SUSCHOICE – Towards sustainable food and drink choices among European young adults: drivers, barriers and strategical implications

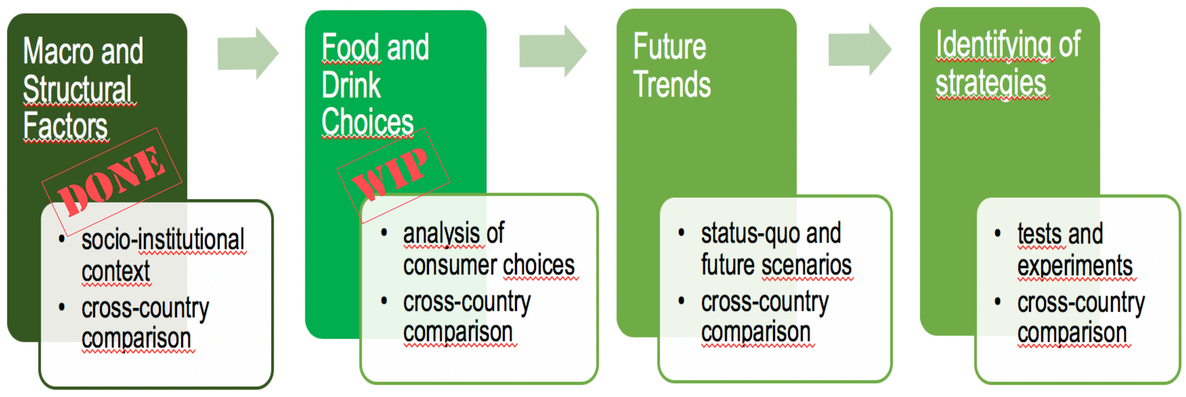
Summary

- The project focuses on European young adult food consumers
- 16 researchers are working on creating a new theoretical framework reflecting the complexity of sustainable consumption choices
- 4 countries involved: Italy (University of Verona), Germany (University of Geisenheim), Norway (Western Norway University of Applied Sciences) and Romania (The Bucharest University of Economic Studies)
- SUSCHOICE employs a triangulation approach combining quantitative and qualitative methods and adopts a multidisciplinary perspective integrating different expertises in marketing, consumer analysis, behavioural economics and agri-food policy

Research questions

- What motivates, or prevents, young adult consumers to engage in sustainable food consumption?
- Will sustainable food consumption increase in Europe in the future?
- What public policies and marketing strategies are effective for promoting sustainable food consumption?

Main project activities



Macro and Structural Factors: Method

- analysis of public policy documents, printed newspapers and social media discourses
- in-depth individual interviews with stakeholders (e.g. food producers associations, policy makers, consumers associations)
- comparative analysis in the four countries

Macro and Structural Factors: Results

- new analytical framework mapping macro and structural factors of sustainable food choices
  - ✓ classification in levels and types
  - ✓ identification of main legislative, public and online discourses on sustainable food choices in each country
- new insights into the factors (e.g., health, diet, budget, innovation) acting differently in the four national contexts

Potential impact

- Complexity in conceptualizing food sustainability and sustainable choices by stakeholders and in media discourses → *different perceptions and expectations between the different actors participating in the food supply chains*
- Differences in discussed topics and solutions, active actors in the debate, development of discourses in the last five years between the four countries → *each country needs specific solutions and can learn from the other countries*
- Macro and structural determinants animated public debates, while surprisingly individual factors of young generations are not so much represented → *young generations need more attention not only in terms of education*
- Dissemination of first research findings through workshops, focus groups and meetings with stakeholders
- Focus groups with consumers testing opinions on macro-structural factors (120 people from 4 countries involved)


Project meeting, Nov 2018


Project presentation, Mar 2019


Project visiting, Sept 2019

BZfE Forum, Sept 2019


Focus Group, Oct 2019

Topic 3: **Understanding consumer behavior and food choice**

SUSFOOD2