Sustainable&Healthy

- Development of sustainable processing technologies for converting by-products into healthy, added value ingredients and food products.

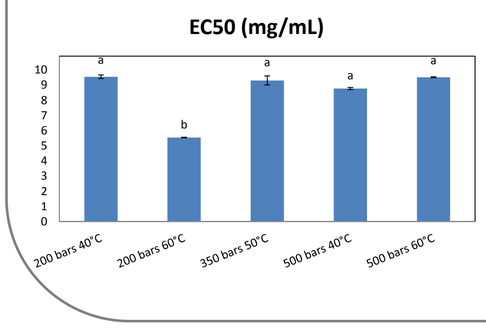
The Sustainable&Healthy project has applied sustainable technologies throughout the food chain in order to retrieve bioactive compounds from side-streams from berry industry and converting them into food gradable ingredients and products.

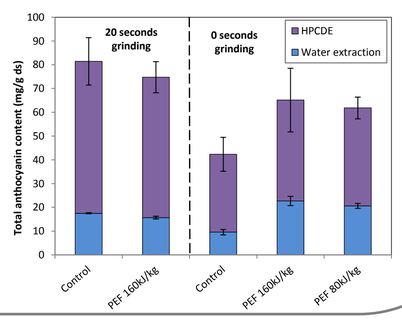
The food value chain

Extraction of bioactive compounds by supercritical fluid extraction (SFE) and pulsed electric fields (PEF)

SFE of bilberry seed oil
200 bar and 60°C obtained higher recovery of vitamin E and higher antioxidant activity.

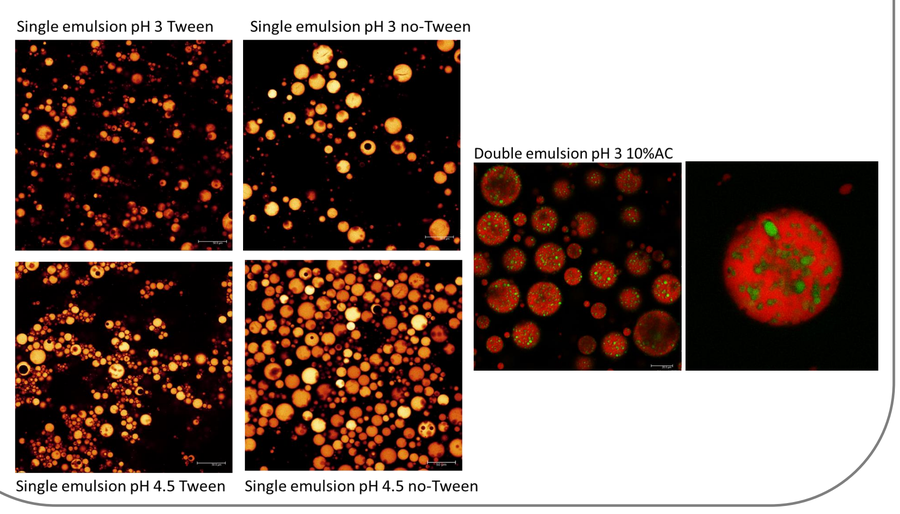
PEF in a two-stage process with high pressure CO2 extraction (HPCDE) improved the anthocyanin yield when applied on unground fresh bilberry pomace, but not on heavily ground pomace.





Value added emulsions

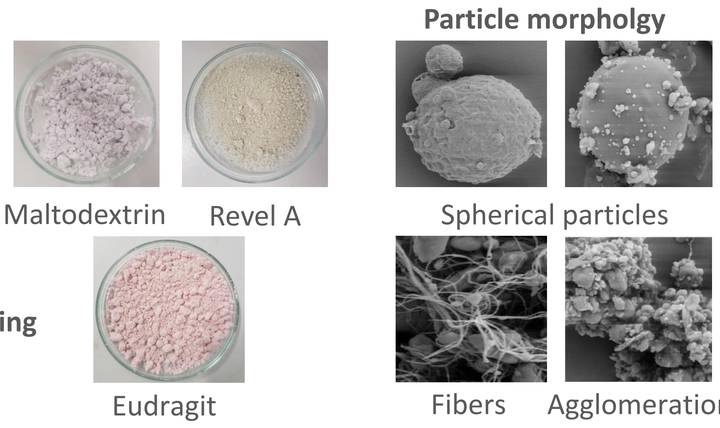
A new non-thermal emulsification method (o/w/o) where bilberry seed oil were located in the inner oil phase surrounded by an aqueous phase of anthocyanins stabilized by whey protein isolate. Effect of pH, concentration of anthocyanins and emulsifier on structure forming properties and resulting microstructure was evaluated.



Stabilization of extracts using Particles from Gas Saturated Solutions (PGSS) and spray drying

The high pressure process PGSS and spray drying are used for the encapsulation of bilberry extract in particles using maltodextrin, the co-polymer Eudragit and the palm fat Revel A as shell materials. Encapsulation will improve the stability of the extracts thus allowing the storage at ambient temperature while the bioactive functionality is preserved.

Particle morpholgy



Enriched dried fruit

Bilberry by-products extract as well as fruit concentrates may be used as enriching substances in osmotic dehydration pre-treatment and also in sustainable technology of dried fruit (pro-helthy snack fruit with added value) production.

„Puffing" (convective-microwave-vacuum drying) method:

- generates high quality product (similar to the freeze-dried fruits);
- the more economic technique (lower energy consumption);
- shorter time (1-2 h) compared to freeze-drying (24 h).

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