Newsletter

Issue 2, 2024

BLUE WAYSE

blue ways to a sustainable Europe

Photo: Shrimp sidestreams by Nofima

The BLUEWAYSE partner SEAGARDEN is extracting chitosan from shrimp sidestreams, which is tested for bioactive properties *in vitro* by the project partner University of Valencia and subcontractor University of Crete.

Fish bone materials and collagen for cosmetics

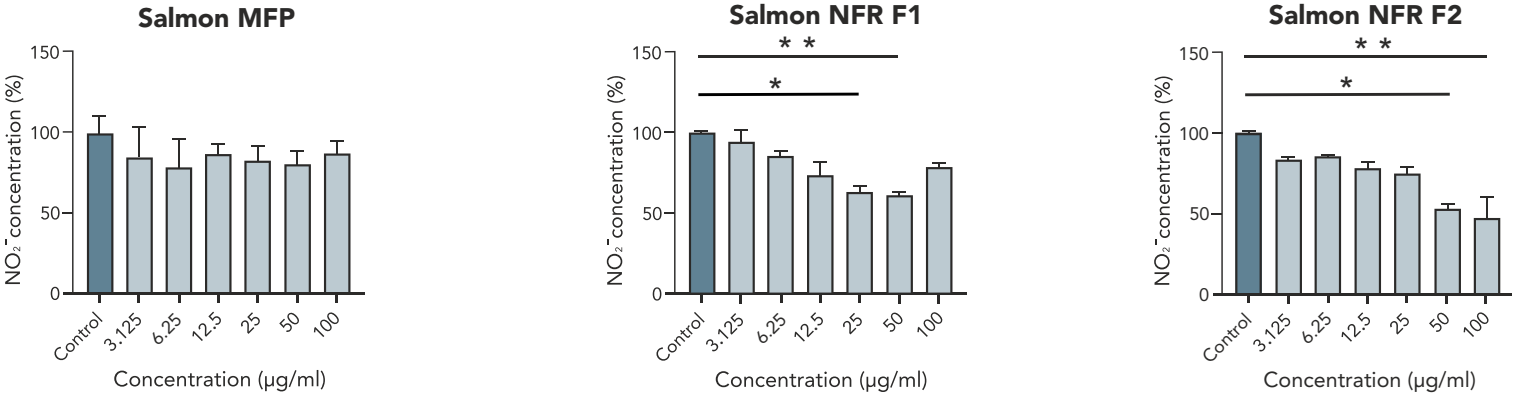
In the second half of 2024, BLUEWAYSE partner CNR advanced its work on assessing the operational feasibility of preserving collagen structure during the purification of fish bone Calcium Phosphate for cosmetic applications. This included evaluating factors such as scalability, reagent handling, and downstream purification. Different methods were tested—namely enzymatic hydrolysis, ionic liquids, and deep eutectic solvents (DES). Each approach demonstrated unique advantages and limitations with respect to solubilisation efficiency, apparent collagen yield, ease of solvent removal, reproducibility, maintenance of native collagen characteristics, cost, and scalability of the process.

Photo: Extracted collagen from fish skins at Nofima's large pilot Biotep, by Nofima

SEAGARDEN is extracting collagen from sidestream fish skin biomass. BLUEWAYSE partner CNR is optimising collagen extraction from fish bones.

Health & nutraceutical development

Comprehensive *in vitro* toxicity, bioavailability, and bioactivity studies were completed for both algal and fish/shrimp-based extracts. Cell studies revealed strong anti-inflammatory and anti-obesity potential, with several extracts reducing key inflammatory markers and influencing appetite-regulating pathways, native signatures, cost, and process scalability.



Anti-inflammatory activity of salmon microfiltration permeate (MFP) and nanofiltration retentates (NFR) from filters with different cut-off sizes (F1 and F2), in macrophage cell culture, performed by the University of Crete.

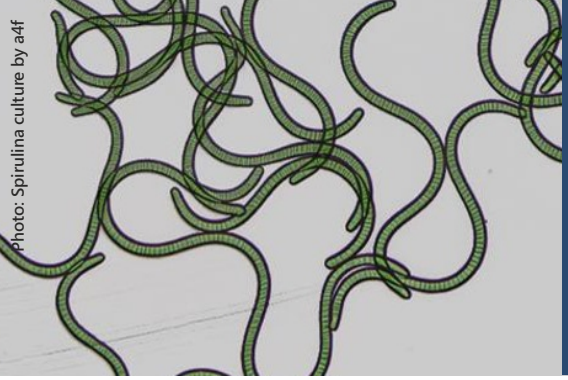


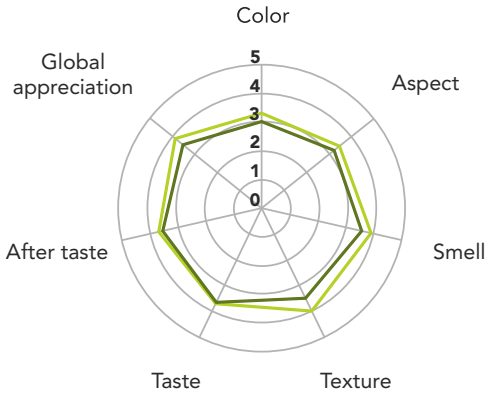
Photo: Spirulina culture by a4f

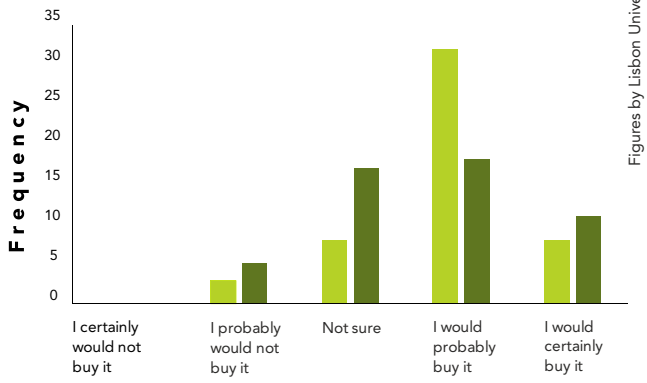
Microalgae-enhanced food innovation

Three microalgae-enriched bakery prototypes, **sourdough, focaccia and brioche**, have been successfully developed by the BLUEWAYSE partner University of Lisbon, and characterised, achieving key project milestones. Sensory and VOC profiling of multiple microalgae species provides valuable insights for optimising product flavour and consumer acceptance. Benchmarking of commercial microalgae-enriched cereal products is guiding the development of our next generation of healthy, consumer-aligned bakery goods.

Brioche

Sensory evaluation (left) and buying intention (right) of brioche breads supplemented with 2% and 4% Spirulina. Sensory scores range from 1 ("extremely dislike") to 5 ("extremely like"). The data represent responses from 50 panelists.

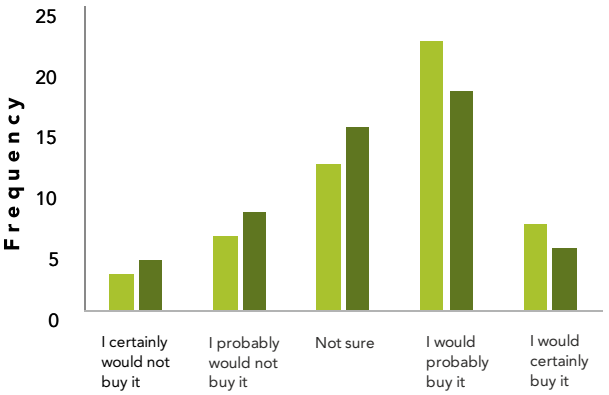




Figures by Lisbon University

Focaccia

Sensory evaluation (left) and buying intention (right) of focaccia breads supplemented with 2% and 4% Spirulina. Sensory scores range from 1 ("extremely dislike") to 6 ("extremely like"). The data represent responses from 50 panelists.



Figures by Lisbon University

Funded by

Co-funded by the European Union

Sustainable Blue Economy Partnership

The Research Council of Norway

Fundação para a Ciência e a Tecnologia

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Agencia Estatal de Investigación

Partners

Nofima

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Consiglio Nazionale delle Ricerche

Instituto Superior de Agronomia

seagarden

Universitat de València

Lund University

University of Crete

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