

FOOD PROCESSING RESEARCH AT KOUVOLA'S UNIT

» January 2026

SYSTEMIC FOOD PROCESSING RESEARCH TEAM



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MASTER'S PROGRAMME IN FOOD PROCESSING TECHNOLOGY

Changing health and nutrition recommendations and global environmental issues set demands for the food industry to develop new, healthier foods sustainably.

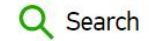


Our Mission

To help companies, society, organizations, and government understand, evaluate, and implement sustainable/added value actions from a systemic/scientific perspective in the food sector.



New Master Program (August 2024)

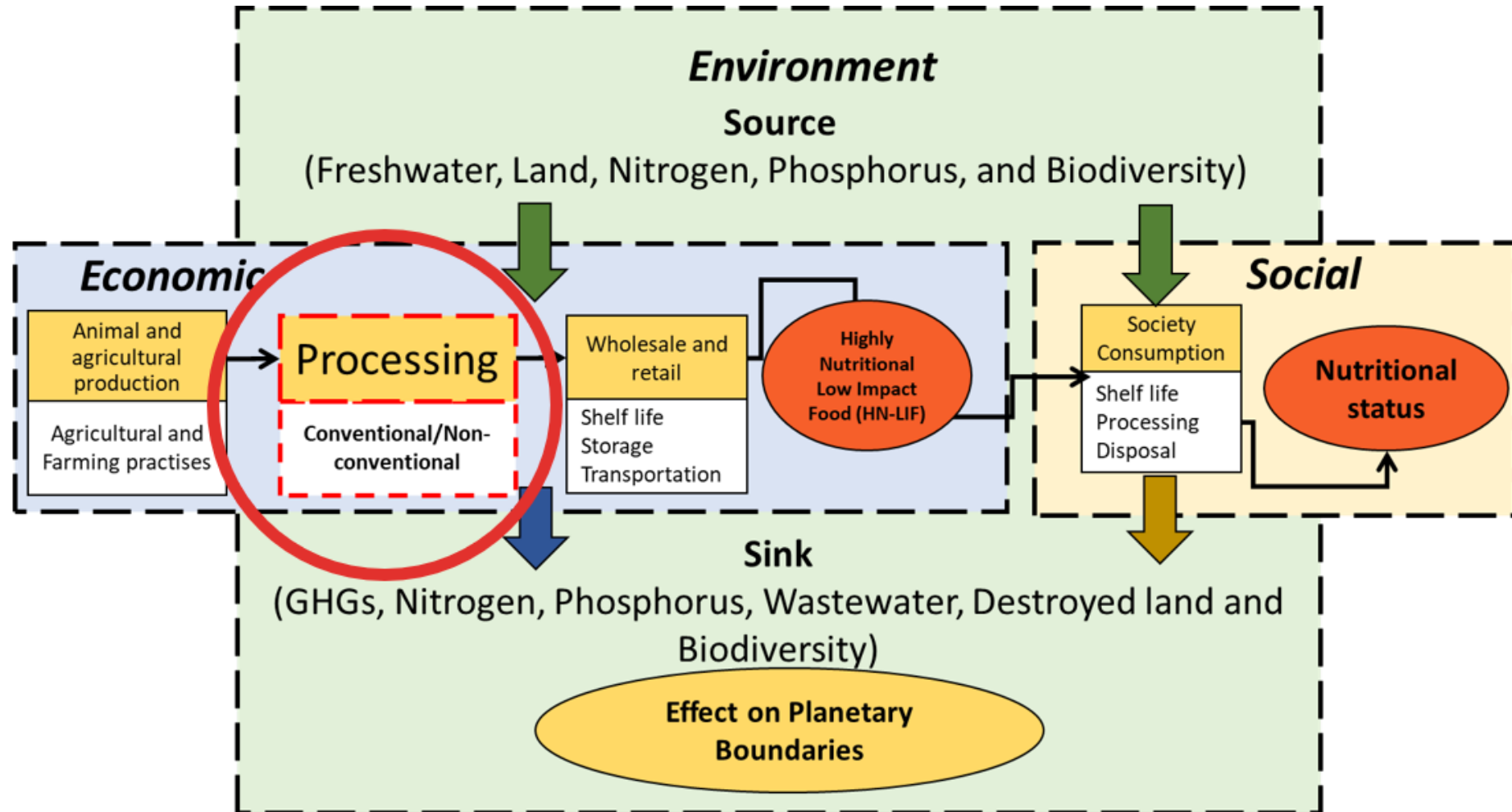
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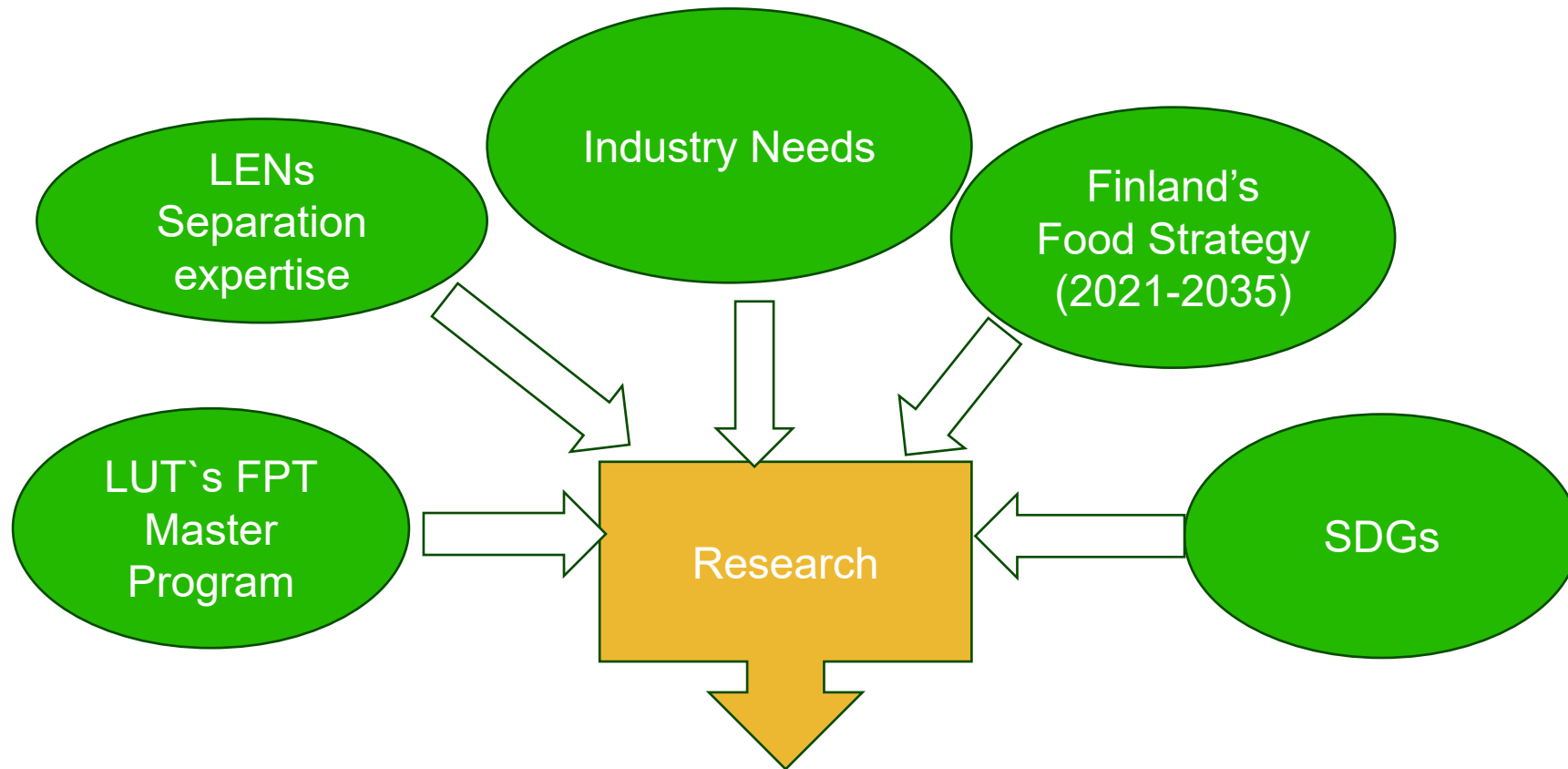
MASTER'S PROGRAMME IN FOOD PROCESSING TECHNOLOGY

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RESEARCH AT KOUVOLA UNIT



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RESEARCH CAPACITY

» LUT School of Engineering Science
Separation Science Department

LABORATORY FACILITIES

- » Kouvola (Next year –Food Processing)
- » Lahti (Separation + Analytical)
- » Lappeenranta (Separation + Analytical)
- » Mikkeli (Bioprocessing)

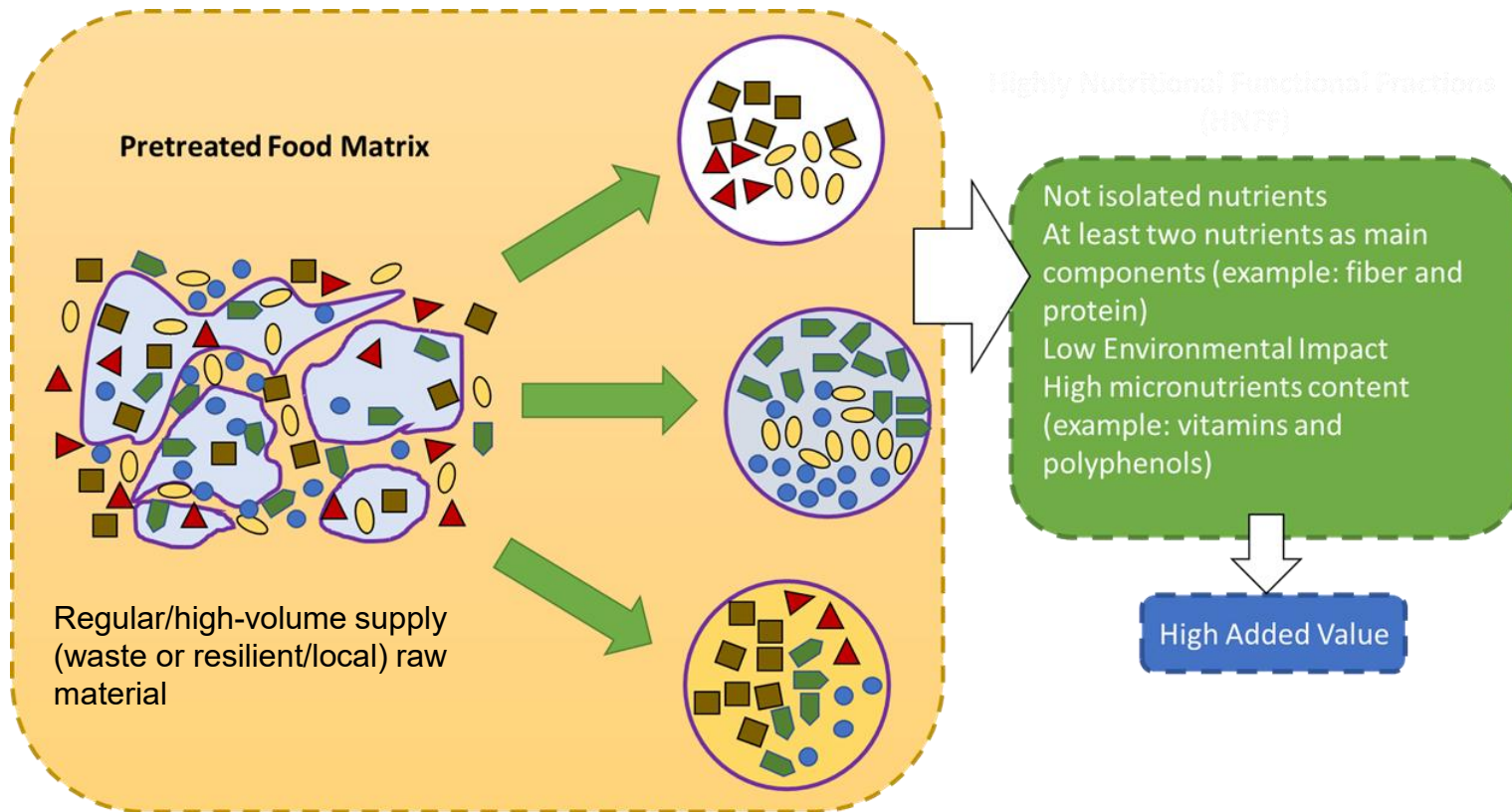
- » LUT School of Energy Systems
- » LUT Business School
- » LUT School of Engineering Science (other departments)

- » External Partners: Universities, Industries, Organizations,

Multidisciplinary Food Processing Research

Conventional/non-conventional processing

» Separation, fractionation, and concentration.



Non-conventional

- » Pulse electric fields (PEF)
- » Ohmic Heating (OH)
- » Ultrasound (US)
- » High hydrostatic pressures (HHP)
- » Supercritical fluid extraction (SFE)
- » Microwaves (MW)
- » Solid liquid extraction (SLE)
- » Chromatography
- » Membranes
- » Crystallization

Process optimization

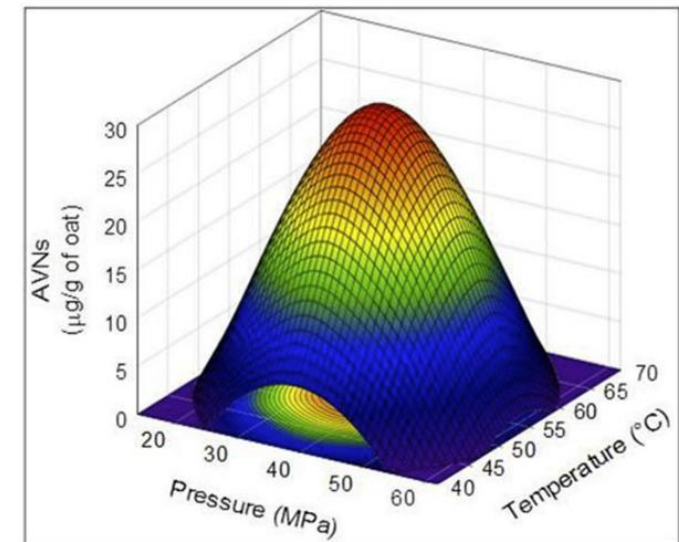
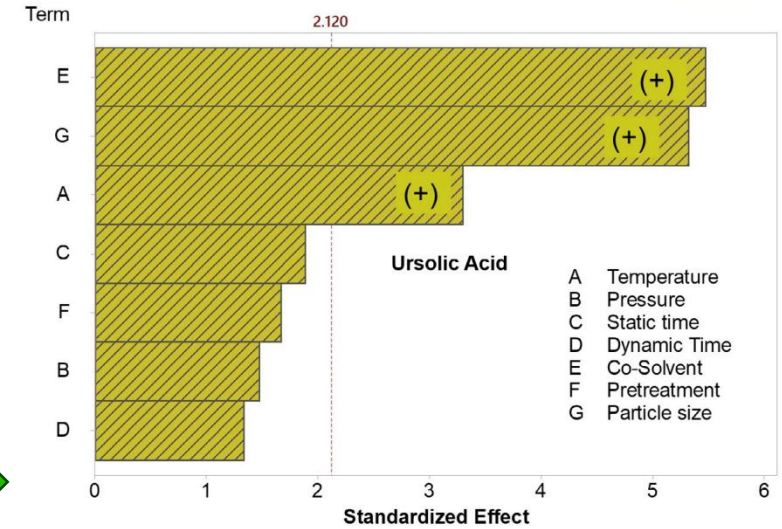
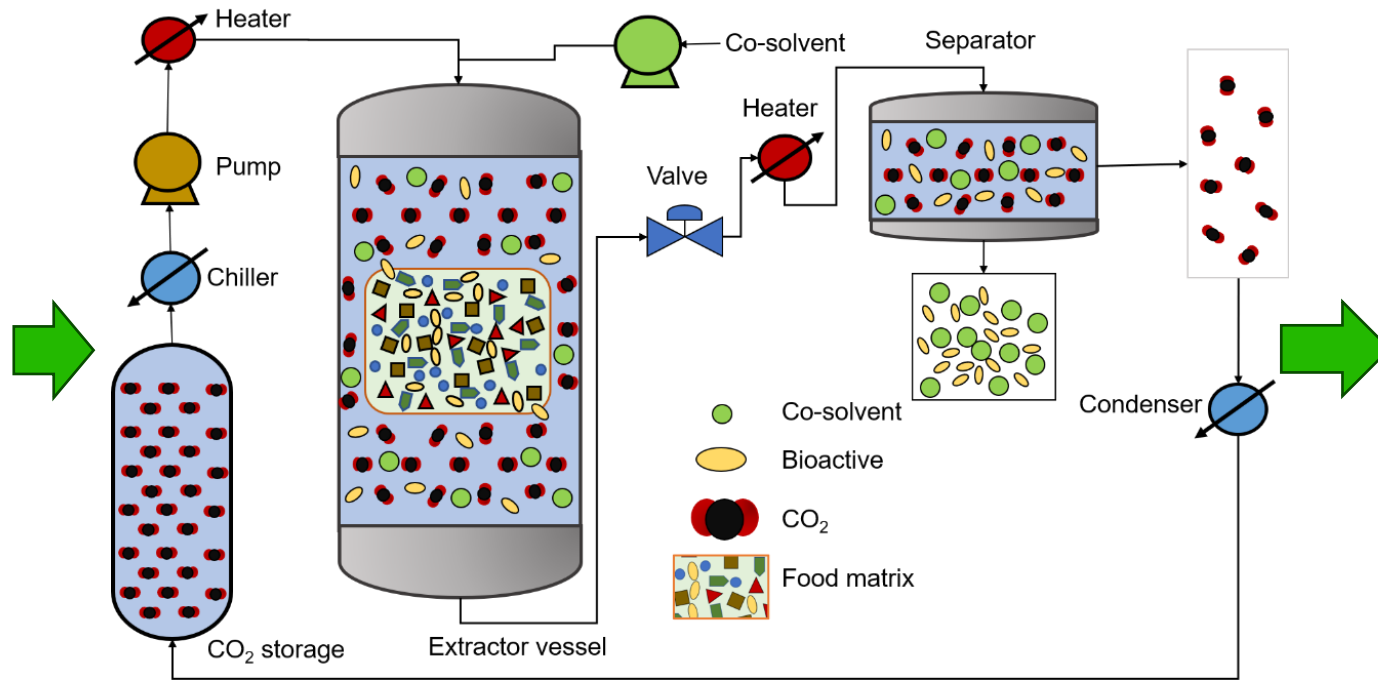
Waste



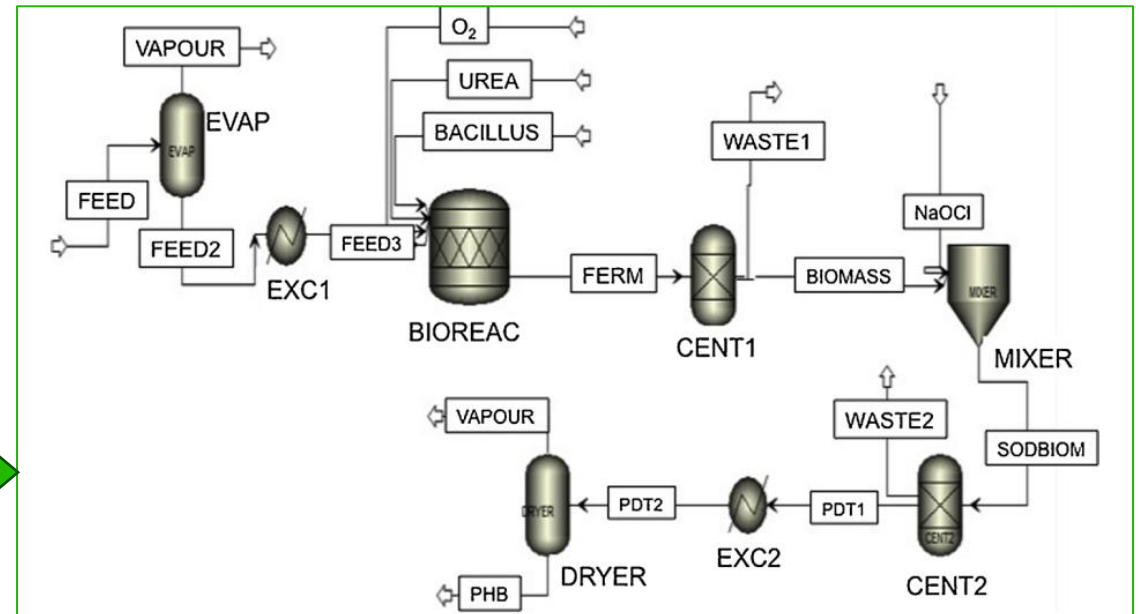
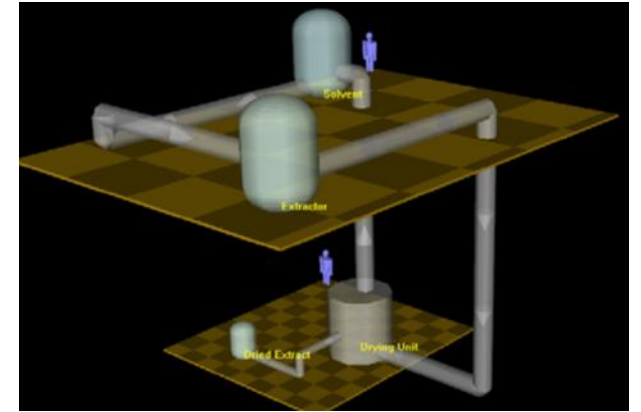
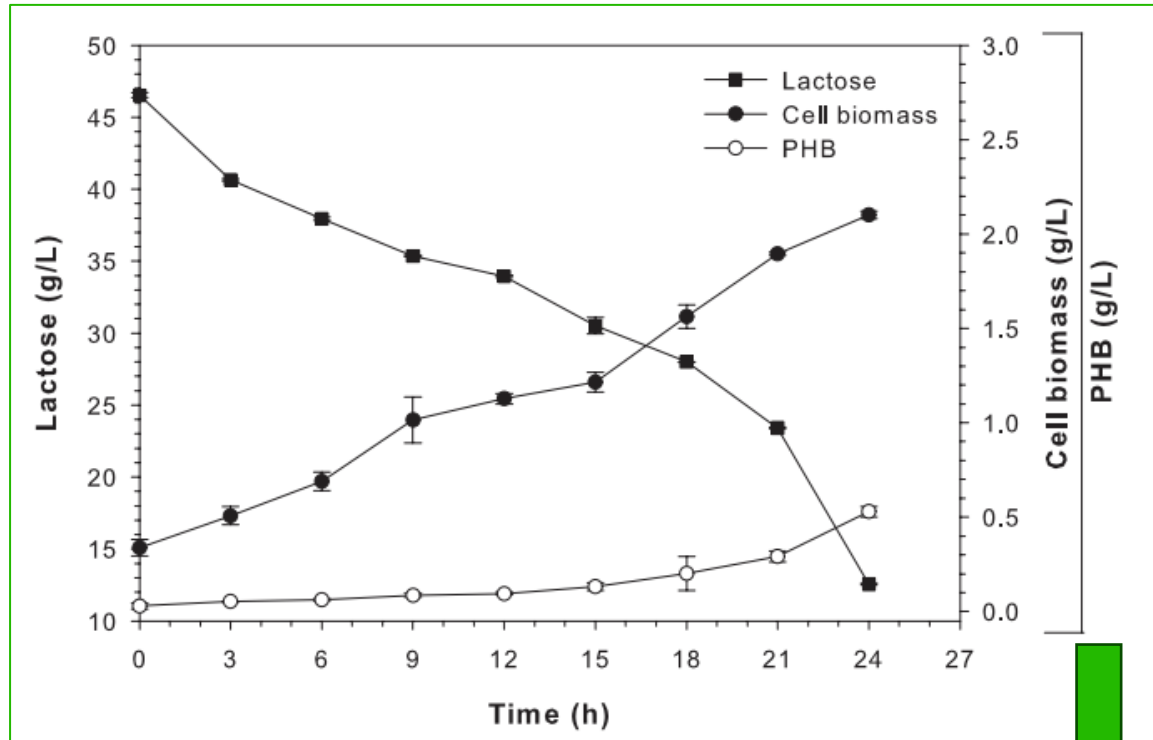
Crops



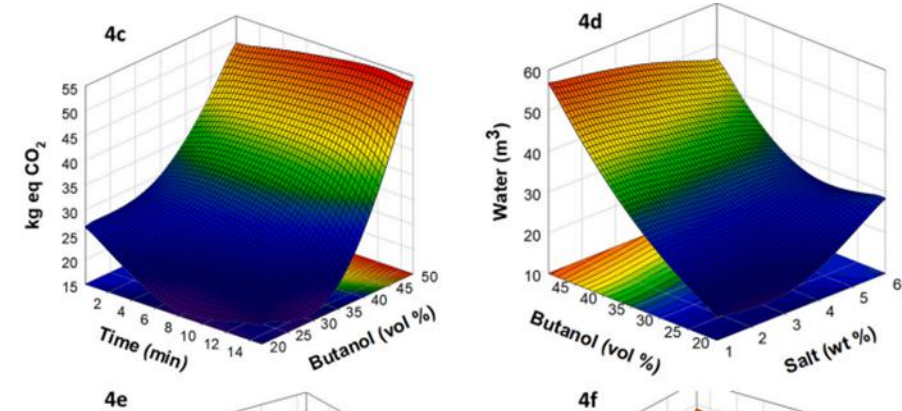
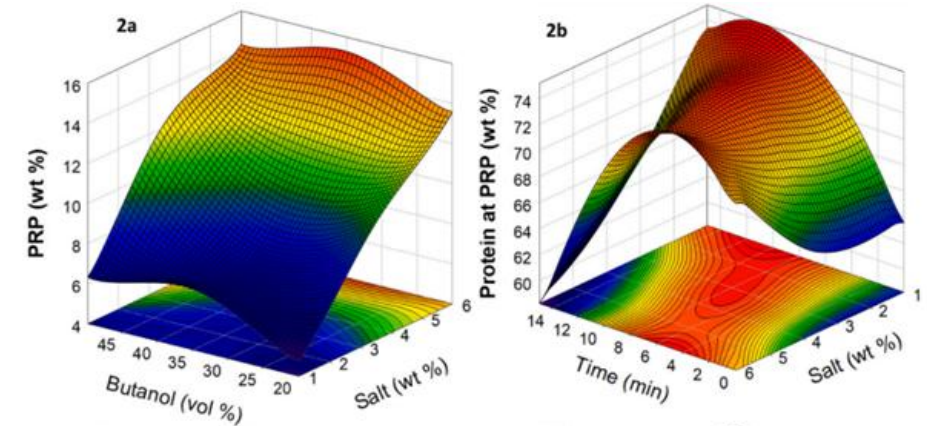
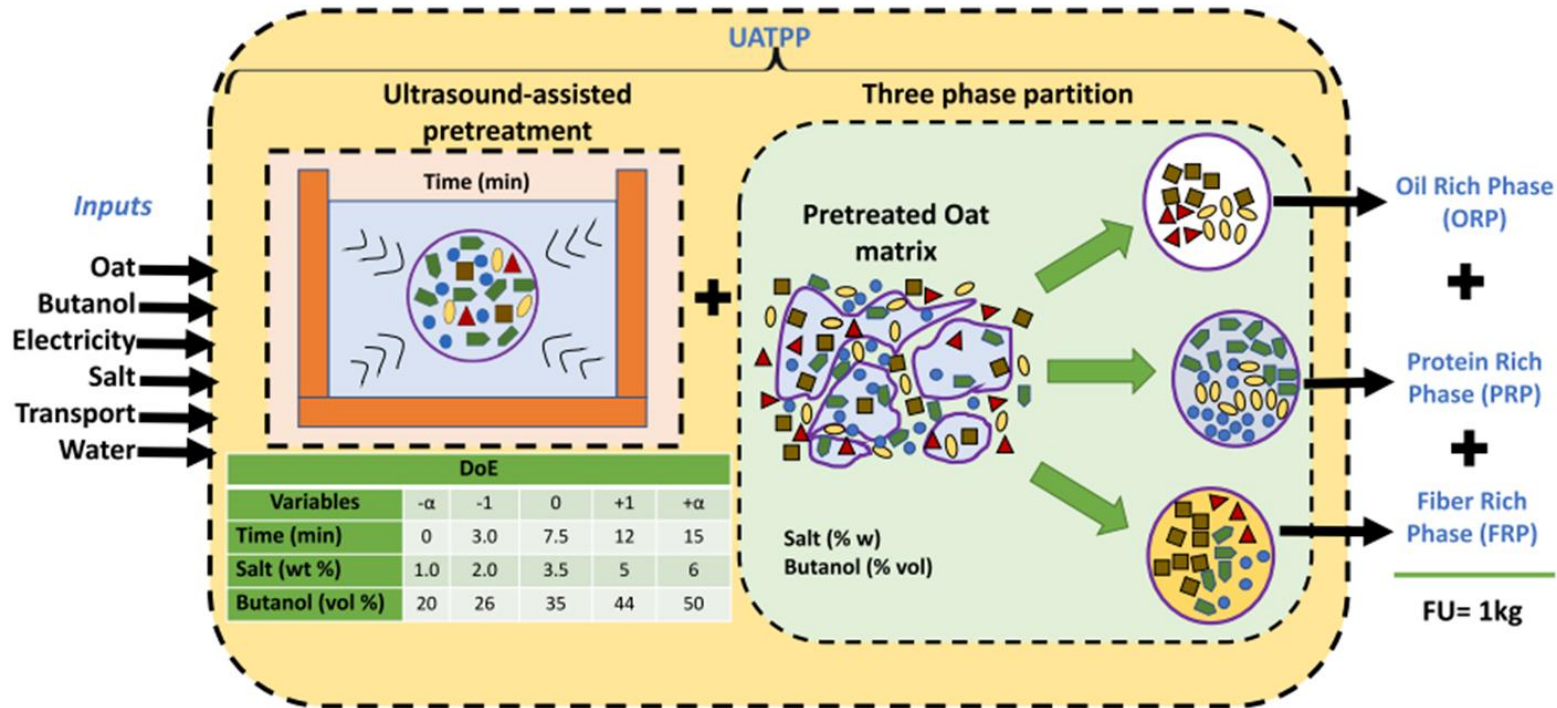
Non-edible crop section



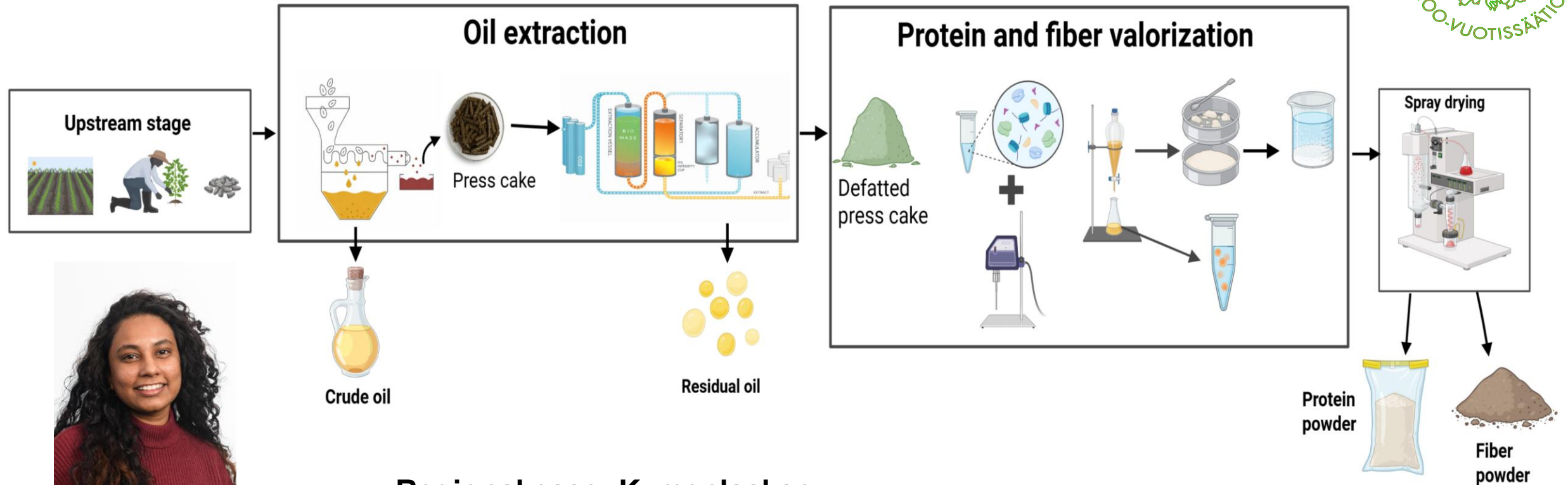
Experimentation+Simulation



Processing+Environmental Evaluation by LCA



SUSTAINABLE PROCESSING OF OILSEEDS INTO FOOD INGREDIENTS



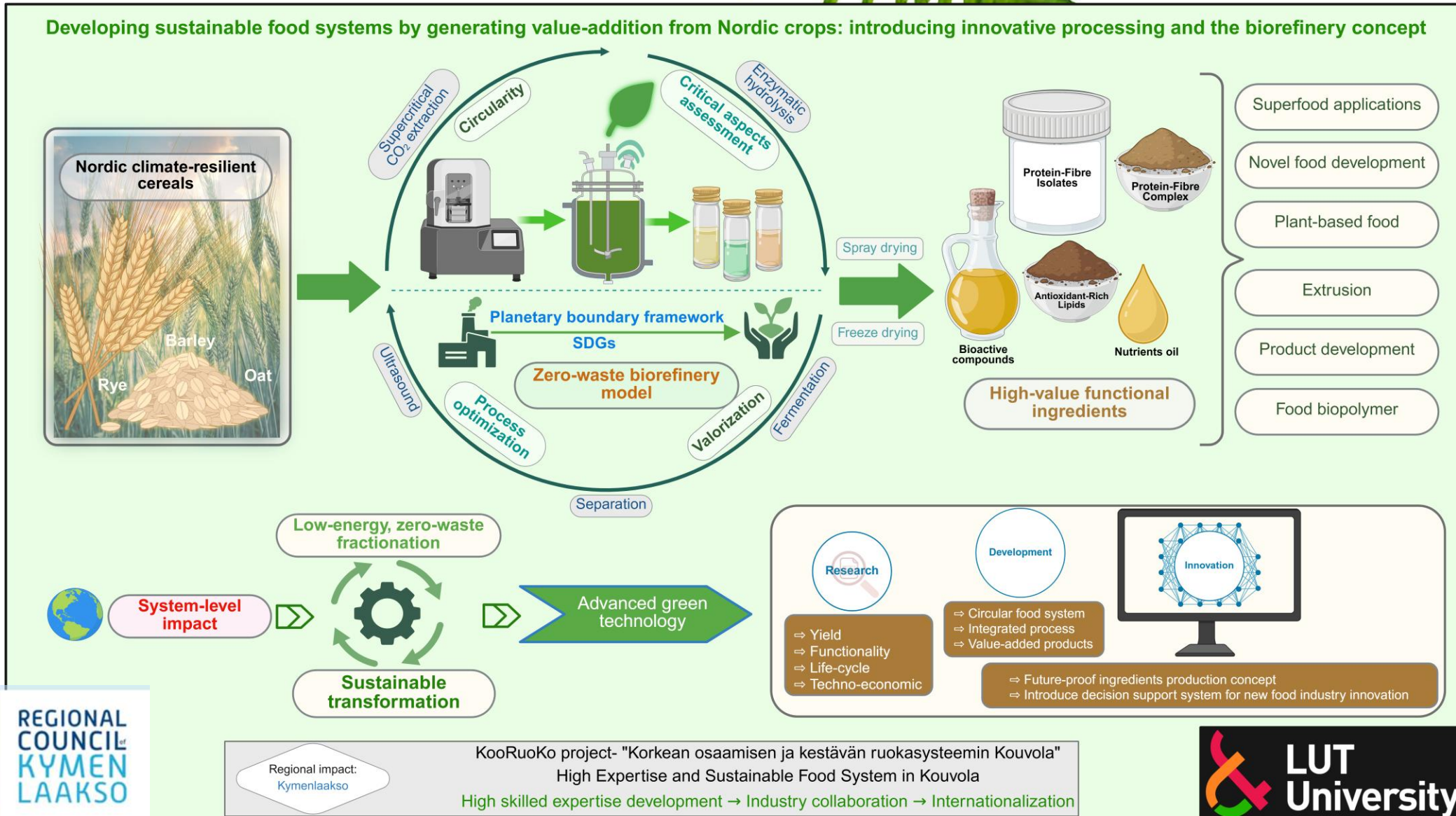
Savindi
Junior Researcher

Regional case: Kymenlaakso

Edible-first approach to valorize Finnish oilseeds into food-grade oils, proteins, and fibers using **green processing technologies**.



Rahul Biswas
Junior Researcher



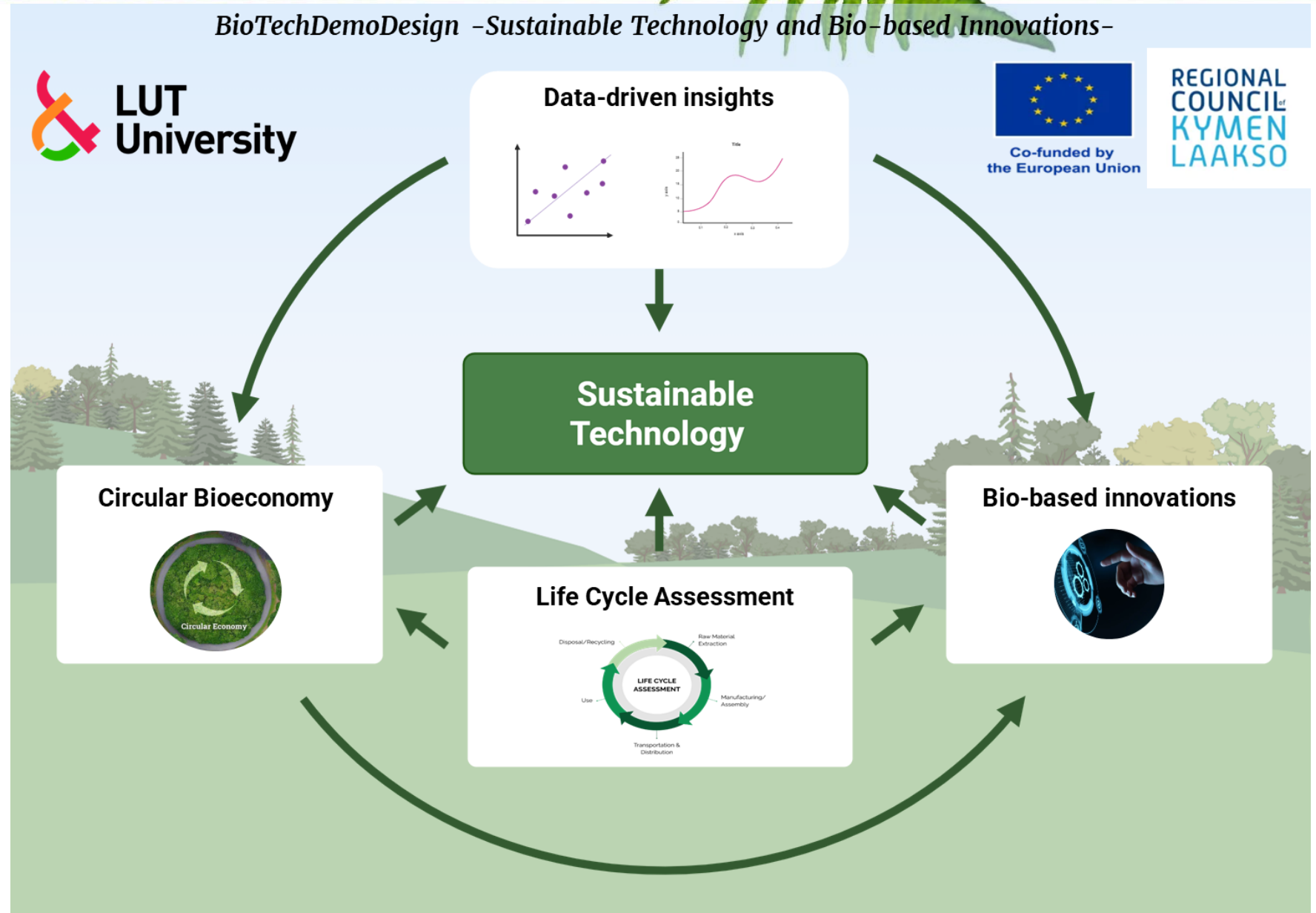
BioTechDemoDesign – Sustainable Technology and Bio-based Innovations–



Okba Guedri
Junior Researcher



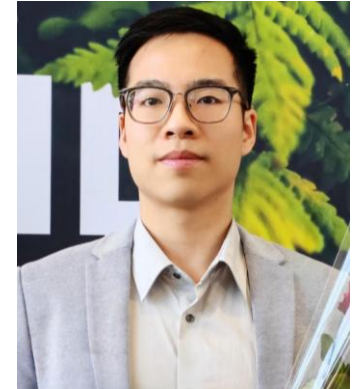
Uudenmaan liitto
Nylands förbund



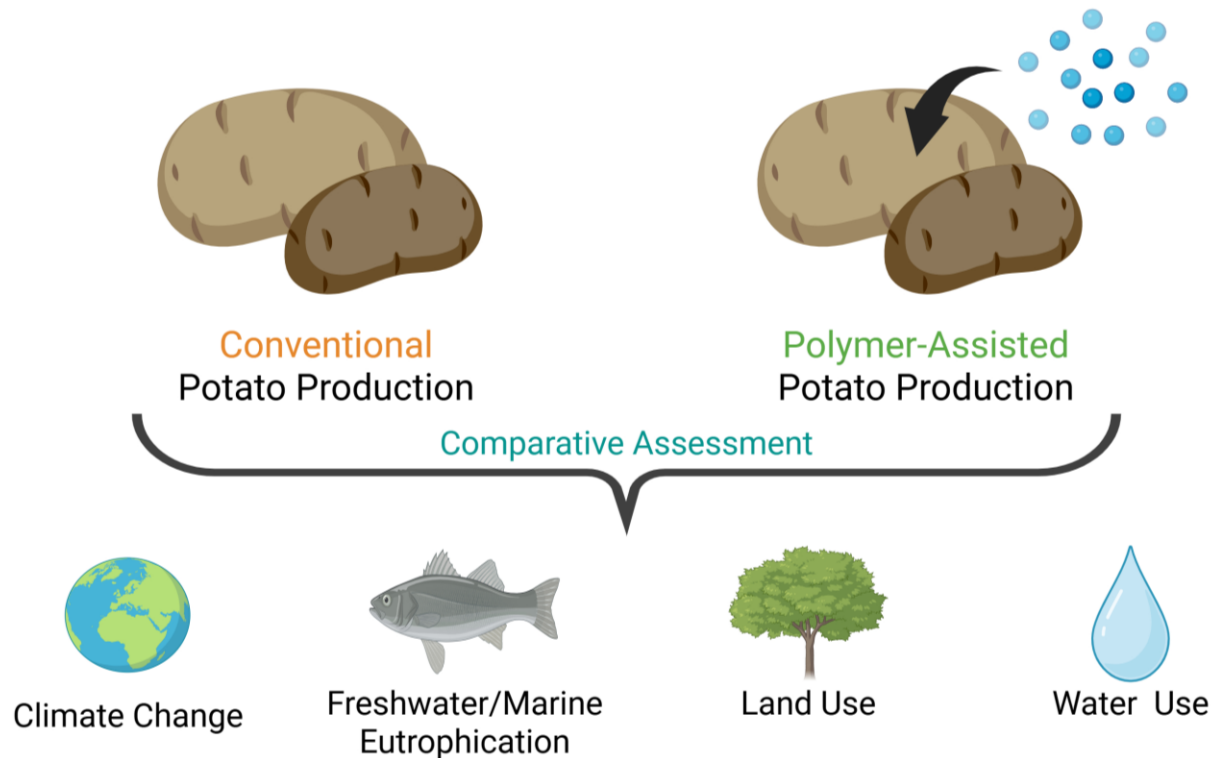
PREDICTIVE TOOLS IN FOOD PROCESSING FOR SUSTAINABLE FOOD SYSTEMS

Comparative LCA:
Conventional vs. Polymer Assisted-Potato Production

Co-funded by the
European Union



Anh Duc
Junior Researcher



» Integrate Life Cycle Analysis (LCA/nLCA) tools with planetary boundary indicators to assess the sustainability of the food system.

» Evaluate by LCA/nLCA new combinations of innovative food processing.



Green Legacy

— OTHER COLLABORATION PROJECTS

Road Map (Book): From an idea to commercial production

*Sustainable Materials for Food Systems: Processing and Innovation
(2027)*

- Utilizing low environmental impact, highly nutritious natural resources.
- Cutting-edge processing technologies,
- Optimizing the properties of new food materials.
- Adopting AI, data analytics, and digital tools to optimize food production, logistics, and distribution.



WILEY



