EU Food Safety Platform

2-3.12.2025

Rome

EU FOOD SAFETY FORUM

Supporting the Food Safety Systems of the future

2-3.12.2025

Rome

www.foodsafetyplatform.eu

Strengthening Europe's Food Safety Framework Through Innovation in Novel Proteins:

Insights from Excel4Pro and PROTWIN

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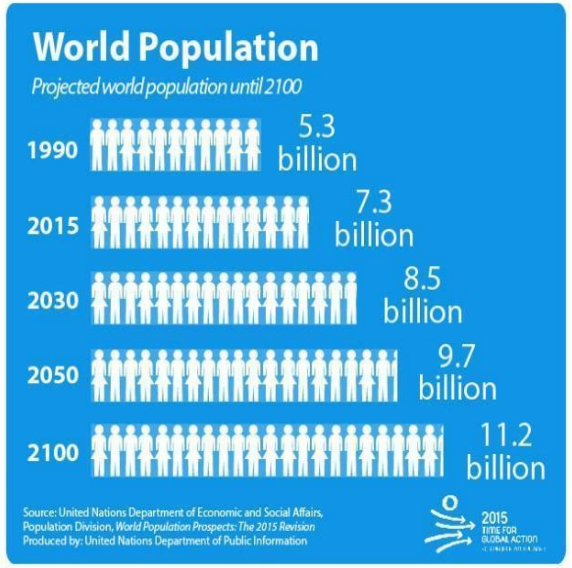
EU Food Safety Platform is an outcome of the FoodSafety4EU project (Grant Agreement No.101000613)

Three key global drivers underpin the increased interest in alternative protein-based diets:

1. The global population growth

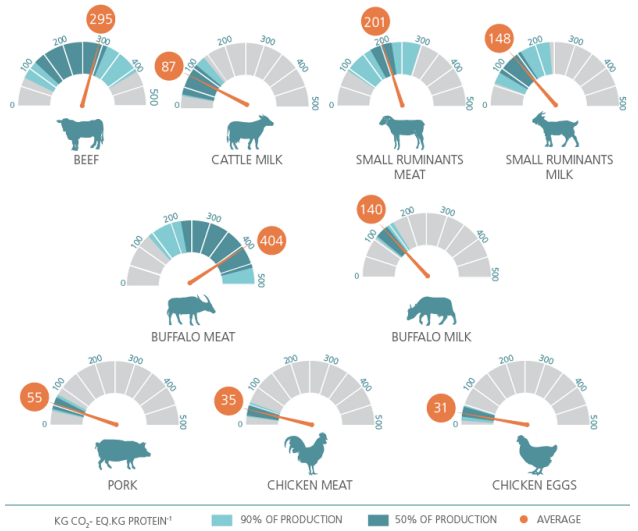


UN Population Prospects 2022[1]

2. The crucial role of proteins in a healthy diet

WHO / UNICEF Child Malnutrition Estimates 2023 [2]

3. The environmental impact of animal-based food chains



1 kg protein / kg CO2 (eq) [3]

[1]https://population.un.org/wpp/ [2] UNICEF/WHO/World Bank Joint Child Malnutrition Estimates, 2023 Edition [3]. http://www.fao.org/gleam/results/en/

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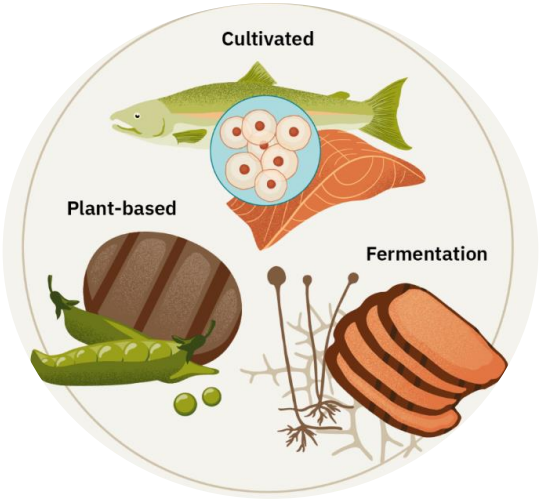
SOLUTION: Protein Diversification

Protein Diversification: is the transition from a limited set of resource-intensive animal proteins toward a greater variety of **lower impact protein ingredients** and food products.



Accelerating alternative proteins

We can develop meat, eggs, and dairy alternatives more sustainably and efficiently by making them from plants, cultivating them directly from cells or producing them by fermentation.

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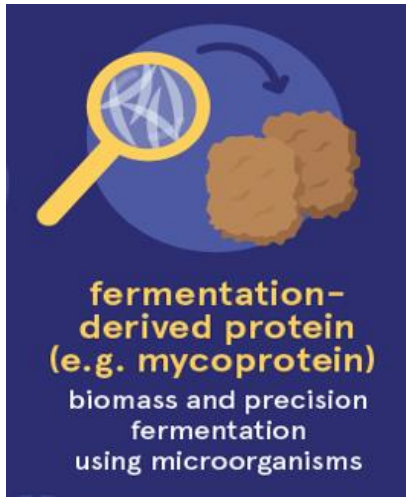
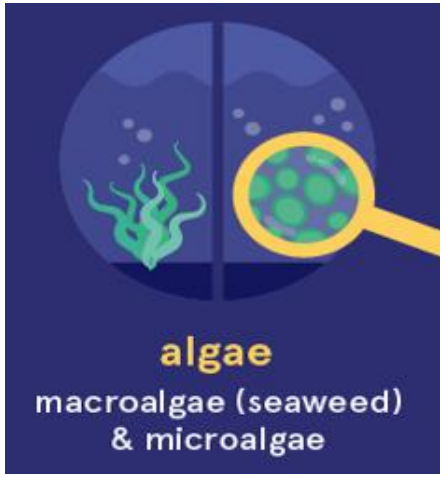
Trending Alternative Protein Sources





Across this landscape, **plant proteins** remain the most scalable and immediately impactful route

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Plant proteins

While an increasing trend in proportion of plant sources included in diet is obvious, the current generation of commercial plant-based alternatives is suboptimal.

more research is needed....

- to develop mild processing techniques for plant proteins
- impact of plant proteins on technological and nutritional functionality
- their digestibility and effect on gut microbiota
- structure, colour, taste and flavour of final food products
- environmental impact

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PROTWIN

TWINNING TOWARDS SCIENTIFIC AND TECHNOLOGICAL EXCELLENCE IN PLANT PROTEIN RESEARCH

Core Partners

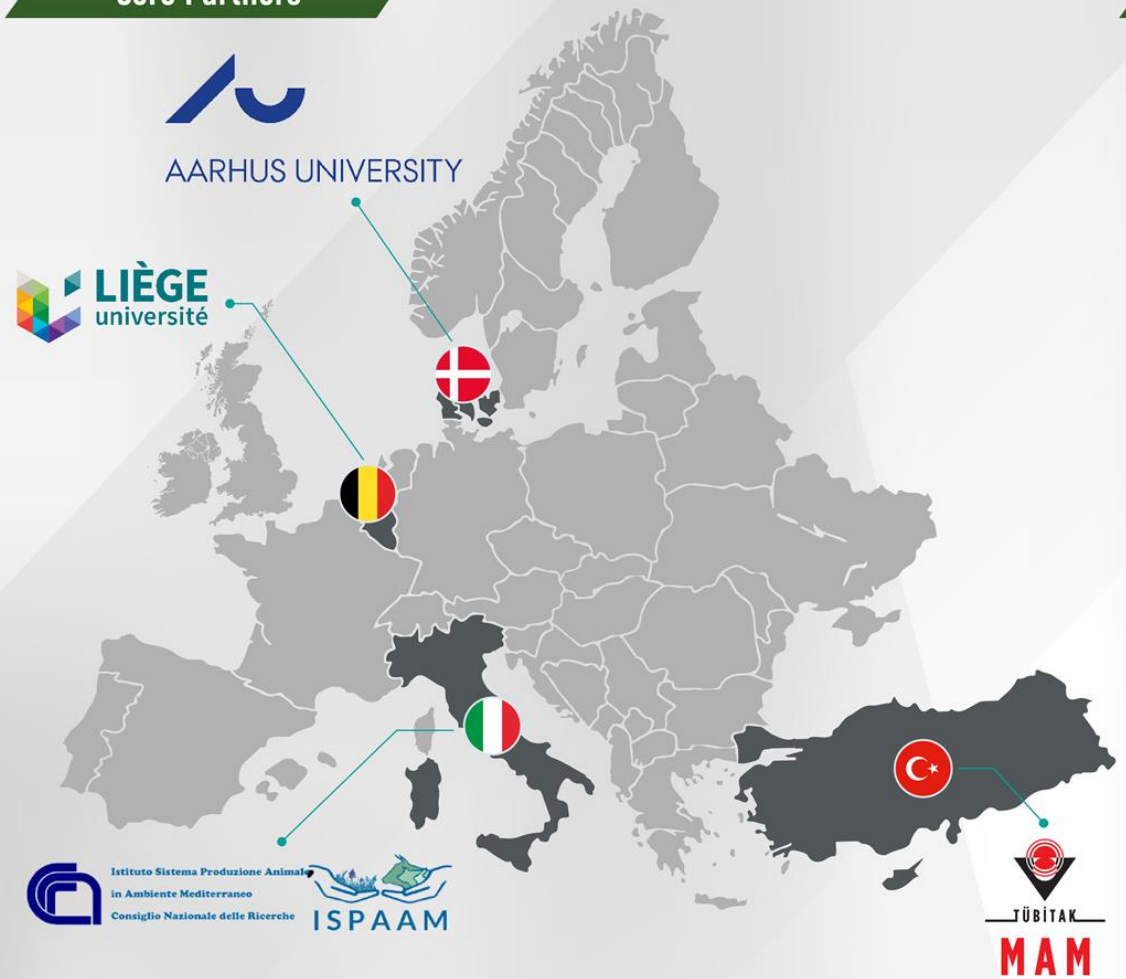
AARHUS UNIVERSITY

LIÈGE université

Istituto Sistema Produzione Animale in Ambiente Mediterraneo
Consiglio Nazionale delle Ricerche

ISPAAM

TÜBİTAK MAM



Associated Partners

KOCAELİ ÜNİVERSİTESİ

IRTA

Ak Gıda

gfi Good Food Institute

ILVO

TAGEM

maysa

FOOD PILOT

KEREVİTAŞ

İSTANBUL MEDENİYET ÜNİVERSİTESİ

pladis

tunay GIDA

DİMES

UNIVERSITÀ DI TORINO

sütaş

göknur

MiGROS

Funded under: Horizon Europe

Widening participation and spreading excellence

Twinning

Start Date: 01 September 2024

Duration: 36 Months

EU contribution: 1.499.531,25 €

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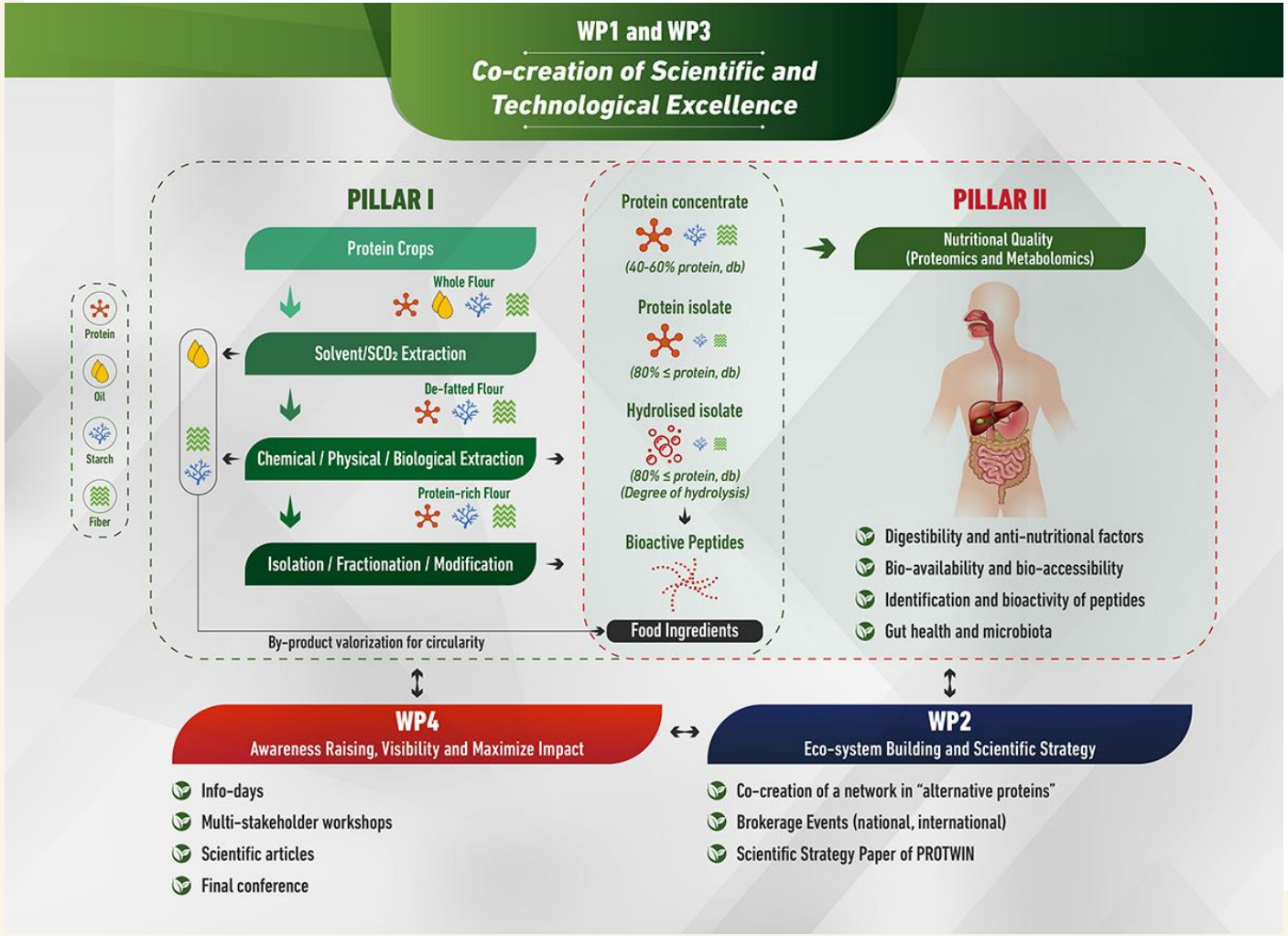

Scientific Focus Areas

- Identification and screening protein crops of Türkiye
- Protein quality and digestibility profiling
- Plant protein based bioactive peptides
- Effects of plant protein ingredients on gut microbiota community and metabolites
- Development of plant-ingredient based food products

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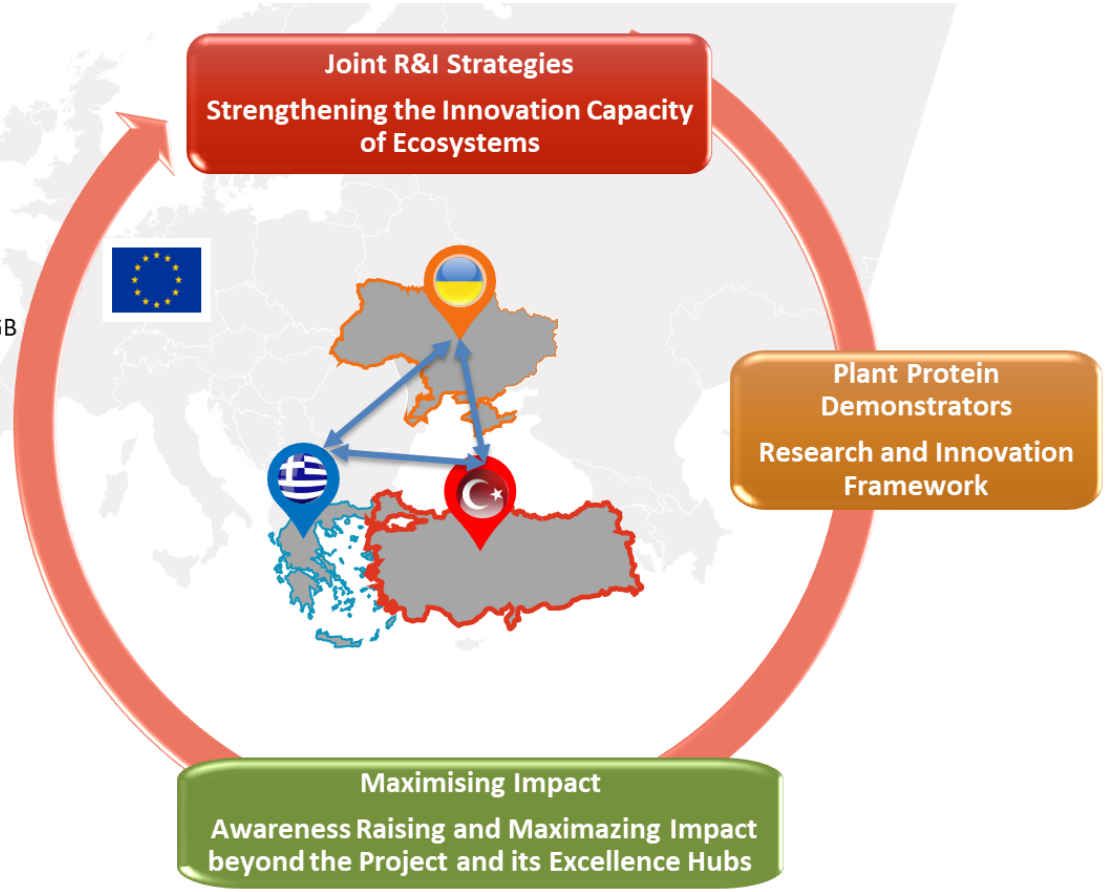
Strengthening the Capacity of Excellence Hubs of Türkiye, Greece, and Ukraine to Support Innovation Ecosystem of Novel Foods Based on Plant Proteins

Excel4Pro

TR-Hub
2 RTO: TÜBİTAK, GTU
1 Public: TAGEM
3 Business: Kerevitaş, Fonka, YTGB
1 NGO: IMPACT

GR-Hub
1 RTO: NTUA
1 Public: RoP
3 Business: JOTIS, Prinsus, WR
1 NGO: FSH

UA-Hub
1 RTO: LPNU
2 Business: Fruktona, PRANA
1 NGO: TSUS



Stakeholders
(Scientists, Agri-Food Processors, NGOs, Public Organizations)

Funded under:
Horizon Europe

Widening participation and spreading excellence - Excellence Hubs Call

Start Date: 01 January 2025

End Date: 31 December 2028

EU contribution: 5.946.368,75 €

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Excel4Pro aims to strengthen the scientific, technological, and innovation capacity of **Türkiye, Greece and Ukrain**e to become an integrated ***Excellence Hub*** for **next-generation plant-based protein economies**.

It seeks to:

- Develop novel, safe, nutritious and functional plant protein ingredients.
- Enable mild, sustainable and energy-efficient processing technologies.
- Support regional innovation ecosystems and accelerate Europe's transition to resilient and sustainable food systems.

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Safety-by-Design Processing

- Use of **mild, energy-efficient technologies** (ultrasound, microwave, enzimatic, aqueous extraction) reduces processing-induced hazards and chemical alterations
- Fermentation reduces **anti-nutritional factors**, improves digestibility, stabilises microbial quality
- Other processing techniques such as **extrusion and enzyme treatment** enhances digestibility and protein solubility
- Mapping **denaturation or other structural changes** provides molecular-level hazard identification

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Digestibility & Microbiota Interactions

- Integrated assessment of **protein digestibility**, amino acid availability and nutritional performance
- **INFOGEST GI digestion** + **SHIME colon model** quantify metabolite formation, peptide fate and microbiota shifts
- Identification and mitigation of **anti-nutritional factors**

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Bioactive Peptides & Chemical Safety

- High-resolution **Orbitrap MS, nano HPLC** for profiling of peptides, oxidation products and processing-induced modifications
- Structure–processing–digestibility datasets support early identification of nutritional and toxicological concerns

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Diversified, Regional and Stable Protein Supply

- Scientific profiling of **legumes and oilseeds** from Türkiye – Greece -Ukraine builds new regional protein sources

- Valorisation of **by-products** (press cakes, legume residues etc) into high-value protein ingredients reduces import dependency and support circular bioeconomy approach

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Cost-Effective, Scalable and Sustainable Processing

- Mild, low-energy extraction and fermentation deliver **cost-efficient, industry-ready** processes
- Excel4Pro integrates these processes into pilot-scale workflows, while LCA analyses evaluate their environmental benefits.

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Harmonised Methods & Analytical Excellence

- Shared analytical capacity: **INFOGEST, SHIME, Orbitrap MS, HPLC, proteomics**, functional property testing.
- Creation of harmonised workflows on **structure–processing–function–digestibility** relationships

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Innovation Uptake & One-Health Oriented Food Safety Foundation

- Pilot-scale prototypes + advanced ingredient development support **SMEs and industry adoption**.
- Integrated datasets from both projects may strengthen **One-Health-aligned safety, nutritional and sustainability evidence** for future EU legislation and SRIA updates.

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In summary, Excel4Pro and Protwin provide complementary contributions that help:

- promotes **safe development** of novel protein ingredients,
- support **evidence-based policymaking** aligned with SRIA priorities,
- and strengthen the **resilience, sustainability, and competitiveness** of Europe's future food systems.

Both projects offer concrete scientific and technological inputs that can be directly used in the ongoing update of the **Strategic Research and Innovation Agenda for Food Safety in Europe**.

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Thank you!

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