



# Turn food industry by-products into secondary feedstuffs via circular-economy schemes

## Project Aims

- **Develop** and **adopt** alternative animal feeds, setting up a circular economy approach in the livestock production by turning food by-products into high value secondary animal feedstuff.
- **Increase** the Mediterranean livestock sustainability by valorizing local food industry by-products to reduced environmental impact and costs.

## Project Specific Objectives

- **Optimize** and scale-up three new feed ingredients from winery, orange juice, and olive oil industry by-products. The processing will include solid fermentation and enzymatic hydrolysis to improve their nutritional value and digestibility and enhanced drying process to stabilize them and foster their feed safety, security, and shelf-life.
- **Test** and validate the entire value chain for three case studies with a multi-actor approach strategy (by-product generation, collection, processing-stabilizing, feed formulation, animal husbandry, consumer acceptability, sustainability and regulatory aspects), which will help the adoption of new feed sources by livestock systems.
- **Validate** three intermediate ingredients and the final diets with animal feeding trials (TRL6-7).
- **Assess** the sustainability of the new value chains from the environmental, economic and social point of view.
- **Define** the market replicability of each value chain in the Mediterranean area.
- **Communicate** and disseminate the project results and developments to the relevant stakeholders.

## Project Case Studies

Three value chains at the Mediterranean area will be validated to create new business opportunities

based on a multi-actor approach in their conception, configuration and its sustainability assessment:

**1<sup>st</sup>**



Grape stem from wineries as a second-generation feedstuff to produce a new feed ingredient for ruminants (dairy sheep and cattle). AZTI / Spain.

**2<sup>nd</sup>**



Orange peel from orange juice industry to produce an improved feed ingredient for ruminants (dairy sheep). NTUA / Greece.

**3<sup>rd</sup>**



Olive cake from olive oil industry to produce an improved feed ingredient for poultry (broiler chicken). HUSD / Egypt.

# Project Methodology

3 Value Chain side streams (Wineries, orange juice industry & olive oil industry)

Optimize and scale-up the new feed ingredients

Test and validate the value chains for the 3 case studies

Validate 3 intermediate ingredients and the final diets with animal feeding trials

Assess the sustainability of the new value chains

Define the market replicability of each value chain in the Mediterranean area

## Impact

- **Development** and adoption of at least three new alternative feed sources from winery, orange juice and olive oil industry by-products.
- **Adoption** of three circular economy approaches in livestock systems by valorizing food by-products (winery, orange juice & olive oil) as alternative feed for livestock (dairy cattle and sheep & broiler chicken) to produce new products (dairy & meat) for human consumption.
- **Valorization** of three local crops by-products (grape stem, orange peel and olive cake) for animal feed by adapting three valorization strategies to the local industry and livestock, but replicable to Mediterranean area.
- **Reduction** of the cost of livestock production by three sustainable and economic alternative feeds and improvement of the quality of final products in compliance with the husbandry nutritional requirements and food and feed safety.

## Project Partnership



Total Budget:

€ 2.202.371,84

Project Duration:

48 months (1/7/2021 - 30/6/2025)

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