



The NEWFEED project

part of PRIMA programme,
supported and funded under EU Horizon 2020 Framework
(Turn food industry by-products into secondary feedstuffs
via circular-economy schemes)

2nd NEWSLETTER July 2023

The **objective of the project** is the development and adoption of alternative animal feeds setting up a circular economy approach in the livestock production by turning the by-products of the food industry into high value secondary feedstuff for animal feed. The project **also focusses** on the increase of the sustainability of the Mediterranean livestock through the valorisation of local food industry by-products that will lead to reduced environmental impact and costs (winery, orange juice, and olive oil food industries by-products, in the South and East of the Mediterranean: Spain, Greece, and Egypt).

The NEWFEED partnership

The project partnership involves 14 partners
(R&D Institutes, Universities, Federations) from 4 countries (Egypt, Greece, Spain and Turkey).



The Advisory Board

NEWFEED Advisory Board consists of 2-3 representative members of the main sectors or stakeholders involved in the recovery and exploitation of food by-products or potentially affected by the project's results:

- Food companies
- Logistic & valorisation companies
- Feed producers
- Livestock
- Public authorities and Policymakers
- Research Organizations and Universities
- General public

Objectives

- **to analyse and validate** the main objectives of the 3 value chains.
- **to validate the proposed solution** in each case study.
- **to get the stakeholders feedback** about Main Challenges and Implementation strategy.

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

Call: Section 1 - Farming Systems 2020
Topic: I.2.1: Genetic conservation and animal feeds
Sub-topic: B) Alternative animal feeds (innovation Actions)
Grant Agreement number: [2015] NEWFEED [Call 2020 Section 1 Farming IA]

2nd Advisory board meeting

15th February 2023
David San Martin - AZTI - dsanmartin@azti.es
Sugoi Auzmendi - UAGA - sauzmendi@uaga.eus

Participants:

- Natalia Koptanovic - SEVT
- Alicia Martinez
- Alvaro, Ylana Contreras
- Arthur, Alex
- Aur Garcia Rodriguez
- Athos Geravitis - SEVT
- Bruno Maria Cho - (External)
- David San Martin (External)
- ELINE KAGAPICOU
- Edelmy Llanusa
- Geert Broymann
- George Tsanthalidis
- Hassan Amry (Eunf)
- Ismael Garcia
- Jose Ramon (External)
- KRISTOFER...
- Kristina Spilina (PRIMA)
- MINGQIANG Angela
- Maria Kavalia
- Maria ES Barba - (External)
- Maria Gutierrez (External)

The **2nd Advisory board meeting** of the PRIMA NEWFEED project took place on February 15th, 2023, where 19 members of 17 companies, academic/research institutes and public authorities participated. This Advisory board served to validate the proposed solution before the scaling up of the Valorisation strategies and Validation of alternative feeds.

The **3rd and final Advisory Board meeting** will take place in June 2024, focusing on getting the stakeholders feedback about Exploitation Strategy and encouraged them to participate in the new business activity.

PROGRESS OF WP3: Validation of the Valorisation and Feeding strategies at pilot scale

- **Case study N°1:** Grape stem-based ingredients were obtained by series of grape stem crushing and washing tests, while the grape stem drying process was scaled up (semi-industrial scale) to improve digestibility of the ingredient (AZTI). Then, the dried grape stems were formulated in the concentrate and trials were carried out to assess the effect of the ingredient on dairy ruminants' productivity, milk quality, health and methane emissions (NEIKER). After that milk quality was tested by a sensory panel of experts.
- **Case study N°2:** Orange juice by-products, after solid fermentation and drying were prepared by National Technical University of Athens (NTUA) and subsequently were included in dairy sheeps' nutrition and trials were conducted by ELGO-DIMITRA to evaluate the effects in animals' productivity, milk quality, health and methane emissions. On the top of that, the University of Western Macedonia (UOWM) produced yoghurt samples in laboratory scale and tested them for their physico-chemical, microbiological, and sensory properties.
- **Case study N°3:** The first batch of olive cake-based ingredients was developed and the first in vivo housing unit for broiler chicken was completed by the Egyptian partners (Heliopolis University for Sustainable Development - HUSD). Broilers were divided based on their weight, while their vitality was also checked. The assessment of fermented olive cake as secondary ingredient for poultry feeding continues with a second housing unit.

2nd physical Annual Meeting

19th & 20th OF JUNE 2023
NATIONAL TECHNICAL UNIVERSITY OF ATHENS, GREECE

NTUA organized the 2nd physical project meeting, from 19th to 20th of June, at its premises in Athens. During the first day, the 2 tasks of WP1 (tasks 1.2 & 1.3) were presented. UAGA presented the conduction of 2nd Advisory Board and the Federation of Hellenic Food Industries (SEVT) the dissemination and communication activities that have been performed during the project's second year. With regards to WP3, AZTI & NEIKER presented the progress made during the second year for the grape stem-based ingredients for dairy sheep and cattle (Task 3.1), NTUA & ELGO-DIMITRA for the orange peel-based ingredients for dairy sheep (Task 3.2), HUSD for olive cake-based ingredients for broiler chicken

(Task 3.3). Afterwards, the progress made for WP4 "Sustainability assessment" was presented by Middle East Technical University (METU) and SEVT. The 1st day of the meeting was completed with a visit to NTUA's facilities, where the experiments to produce grape stem-based ingredients (case study 1) take place and a social dinner in Athens.

The second day started with the presentation of WP6 "Management of the project" by AZTI. Administrative and financial management issues were discussed in detail, while an extended discussion took place with the project officer. Finally, the next steps and the foreseen milestones and deliverables were highlighted.



Interview with NTUA



Dr. Elli-Maria Barampouti



Dr. Sofia Mai

How your beneficiary contributes to NEWFEED project?

The key partners in the 2nd case study that assesses the use of orange peels from orange juice industries to produce an improved feed ingredient for dairy sheep are: (i) SEVT, NTUA, ELGO-DIMITRA and UOWM. With regards to their roles, SEVT ensured the feedstock supply and the respective logistics, with special care to ensure feedstock's safe transportation to NTUA premises. Hellenic Fruit Juices Industry is the selected industry for feedstock provision. NTUA optimized the valorization strategy, scaled up the entire process and is producing the ingredients for the animal feed demonstrative actions. ELGO-DIMITRA determined the Feeding Strategy based on the analysis of the obtained ingredients and is performing the animal feed demonstrative actions. Last but not least, the UOWM is assessing the quality and the nutritional value of food resulting products (milk and yoghurt) and performing the respective sensory analysis.

What process did you follow to produce an improved feed ingredient for dairy sheep?

We used a by-product from Hellenic Fruit Juices Industry, and we turned it into a high protein content component, while increasing the digestibility of the feedstock. After several preliminary trials, a valorisation strategy was designed. Within this strategy, orange peels are enzymatically hydrolysed, and a liquid fraction rich in sugars and a hydrolysed solid residue are obtained. The liquid fraction is used for yeast cultivation aiming to produce single cell protein. The latter is mixed with the hydrolysed solid residue to produce advanced animal feed. The final feedstuff is dried to stabilise the product in terms of shelf-life and feed safety.

Why are orange peels an interesting feedstock for upcycling?

First of all, it is necessary to highlight the potential of orange peels as feedstock. Orange peels could stand as a possible by-product of the food industry that could be valorised, since they constitute an organic raw material of high value. From an industrial point of view, an orange can be considered as a composite of 43% juice and 57% peel and pulp. According to the latest FAO statistical data, the potential of peels production is over 8 million tonnes globally and nearly 600.000 tn in Europe. Thus, in the context of circular economy, the valorisation of orange peels is of high priority given their high availability and composition.

Was there any difficulty you had to face, and how did you manage to overcome it?

Of course, several difficulties were faced throughout the implementation of the project that we managed to overcome. First of all, orange peels constitute a sensitive and perishable raw material that needs to be processed really soon after its production. Thus, the treatment plant should be in very close proximity to the industrial production plant. The hydrophilic nature of pectin also poses difficulties in the drying process that were overcome by application of milder drying conditions. After the implementation of the pilot trials, it was also revealed that in future upscaling, the new feedstuff (processed orange peels) would be better to be recovered via centrifugation since the particle size of the produced yeast and processed peels is very small and filtration process faced a lot of operational difficulties.

Can you share with us your most interesting findings?

It is worth noticing that the feedstuff prepared under the optimum conditions of the implemented strategy presented higher (23.11%) in vitro organic matter digestibility and almost doubled protein content. This is of outmost importance for advanced feedstuffs and for the sustainability of livestock farming.

At what stage is your research now/which are the next steps?

Currently, feed efficiency trials are performed using 3 groups of Chios breed dairy sheep which are fed with conventional animal feed, animal feed with unprocessed dried orange peels and animal feed with the component prepared under the optimum conditions. Additionally, from the milk produced, yoghurt is prepared and its sensory evaluation is performed. The potential environmental impacts throughout a whole value chain are also assessed.