Project code: 2024-1-RO01-KA220-HED-000246776

Enhancement of Agro Food Chain Byproducts through Innovative and Sustainable Methods
Project Acronym: eAfoBy

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REPORT - TRAINING FOR STUDENTS

University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca

Faculty of Food Science and Technology

21.07.2025-25.07.2025

Between July 21-25, the training entitled ***The main agro food chain byproducts from Romania and Mediteranean contries*** took place at University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania, COORDINATOR (CO). At the session attended 25 students, as follows:

- Coordinator (CO): Gina Maria Cucuiet, Chiorean Nicoleta Cristina, Alina Rișco, Szekely Cristian, Balas Petruț Cristian, Maria Florina Roșca.
- P1 (UPV) – Domenech Valiente, Tania; Matas Gil, Adrián; Molina Montero, MCarmen; Rodriguez Barrios, Yeison Fernando; Rus Fernández. Patricia; Vicente Jurado, Diana.
- P2 (Universidade do Porto): Diana Isabel Lopes de Melo Ferreira, Liliana Patrícia Ferreira Espírito Santo, Marlene da Conceição Pereira Machado, Matilde Maria Baptista Antão Jorge Rodrigues, Tatiane Cristina Gonçalves de Oliveira, Thiago Freitas Soares

Co-funded by the European Union

- P3 (Universitatea de Stiintele Vietii ,,Regele Mihai I" din Timisoara): Argyelan Cristian, Tarkanyi Patricia Cristina, Dragomir Christine, Ghițulescu Andreea, Lăcătăș Mihaela, Neagu Robert-Daniel, Brumar Grațian Ilie

The student training program held between July 21–25, 2025, in Cluj-Napoca, Romania, was organized under the auspices of the ERASMUS+ KA220 project entitled Enhancement of Agro Food Chain Byproducts through Innovative and Sustainable Methods (project code: 2024-1-RO01-KA220-HED-000246776). The event was coordinated by the University of Agricultural Sciences and Veterinary Medicine (USAMV) Cluj-Napoca and brought together from various partner institutions across Europe.

The central aim of this training program was to provide students with a multidisciplinary and transnational educational experience focused on the valorisation of agro-food chain by-products from Romania and Mediterranean countries. By integrating theoretical knowledge, practical skills, and real-world case studies, the training emphasized sustainable development, circular economy principles, and innovation in food science and technology.

The training program was meticulously structured over five days, each focusing on a specific thematic axis—ranging from regulatory and technical fundamentals to practical food processing applications and international comparative analysis. Participants were immersed in interactive lectures, pilot plant demonstrations, hands-on product development, and industrial visits, all aimed at developing their capacity to contribute to the sustainable transformation of agro-industrial waste streams into value-added products.

The following daily summaries provide a detailed overview of the academic, practical, and collaborative activities that took place throughout the duration of the training. The inaugural day commenced with participant registration and welcoming speeches delivered by key academic figures, including the Vice-Rector for International Relations and the Dean of the Faculty of Food Science and Technology. The project coordinator formally opened the event, providing an overview of the training objectives.

A comprehensive presentation of the University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca was delivered, followed by a discussion of the event's organizational aspects. All students introduced themselves, fostering a collaborative environment.

Afternoon sessions focused on the integration of the project activities within the broader training program and an in-depth theoretical exploration of by-products in the Romanian agro-food chain. Emphasis was placed on regulatory frameworks at national and EU levels governing the management of these by-products. The day concluded with an open discussion and synthesis of the presented material.

In the day 2 of training, students participated at practical applications and products development through using agro food chain by-products such as apple pomace, brewer spent grain and tomato pomace. This day emphasized hands-on engagement. It began with a practical introduction to the main agro-food by-products from Romania, highlighting their potential for innovative product development.

Participants collaboratively developed new product recipes and were introduced to the pilot processing facilities of the Faculty of Food Science and Technology.

In the following sessions, students engaged in manufacturing activities within the bakery, pastry, and gastronomy pilot stations, applying by-products in food formulations.

Post-lunch activities involved the physicochemical characterization of the newly developed food products, assessing quality and functional parameters. The day concluded with a reflective session discussing the results and challenges encountered.

Day 3 – July 23, 2025 was dedicated entirely to fieldwork focused on the valorization of agro-food by-products. Participants visited the Torockoi milk and dairy processing plant in Colțești, Alba Iulia.

The training explored real-world applications of theoretical knowledge, examining how dairy industry by-products are managed and potentially reused in sustainable production chains.

The field visit facilitated a critical understanding of the logistical, technological, and regulatory challenges involved in by-product valorization.A post-visit session allowed students to engage in discussions and synthesize insights gained from the site.

The fourth day featured comprehensive theoretical modules on by-products derived from fruit juice processing (apple and plum), alcoholic beverage production (beer and țuică), and cereal processing. Presentations included classification systems based on processing technologies and detailed analyses of bioactive compounds such as polyphenols and dietary fibers present in these residues. The sessions provided a multidisciplinary view of the functional potential of by-products, discussing their bioactivity and relevance for human health.

These modules were supplemented by in-depth discussions, encouraging students to compare findings across different sectors and countries.

The final day focused on agro-food by-products originating from Mediterranean countries. It included a theoretical session detailing the types of residues, their technological origins, and the physicochemical properties of their bioactive compounds.

Participants then underwent a knowledge evaluation session to assess the competencies acquired during the training program.

The program concluded with a comprehensive discussion, summarizing key takeaways, exchanging feedback, and outlining future collaboration prospects among the participants and institutions involved.

The five-day training program held at the University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca offered an intensive and well-structured academic experience, targeting the valorization of agro-food chain by-products through both theoretical and practical components. The agenda successfully bridged interdisciplinary knowledge, sustainability principles, and innovation in food science.

Throughout the training, students engaged in a comprehensive curriculum that emphasized:

- **Systematic understanding of by-products** originating from various agro-industrial sectors (e.g., dairy, cereals, fruit processing, alcoholic beverages) in both Romania and Mediterranean countries.
- **Exploration of bioactive compounds** present in these by-products, focusing on their biological activity, physicochemical properties, and potential applications in food innovation and circular economy.
- **Hands-on training** in modern pilot processing facilities, providing participants with practical skills in product development, formulation, and quality assessment.
- **Exposure to real industrial contexts**, such as the visit to a dairy production unit, which enhanced the students' comprehension of applied valorization techniques and sustainability challenges.
- **Promotion of transnational collaboration and interdisciplinary learning**, fostering exchange among students and faculty from different institutions and cultural backgrounds.

The training effectively underscored the critical role that scientific innovation and regulatory awareness play in transforming agro-food by-products from environmental burdens into valuable resources. Participants gained advanced competencies in identifying, characterizing, and applying these materials within sustainable food systems.

In conclusion, the program not only enriched the academic and professional development of the students but also reinforced the objectives of the Erasmus+ project by promoting sustainable practices in the agro-food sector through education, collaboration, and applied research.

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