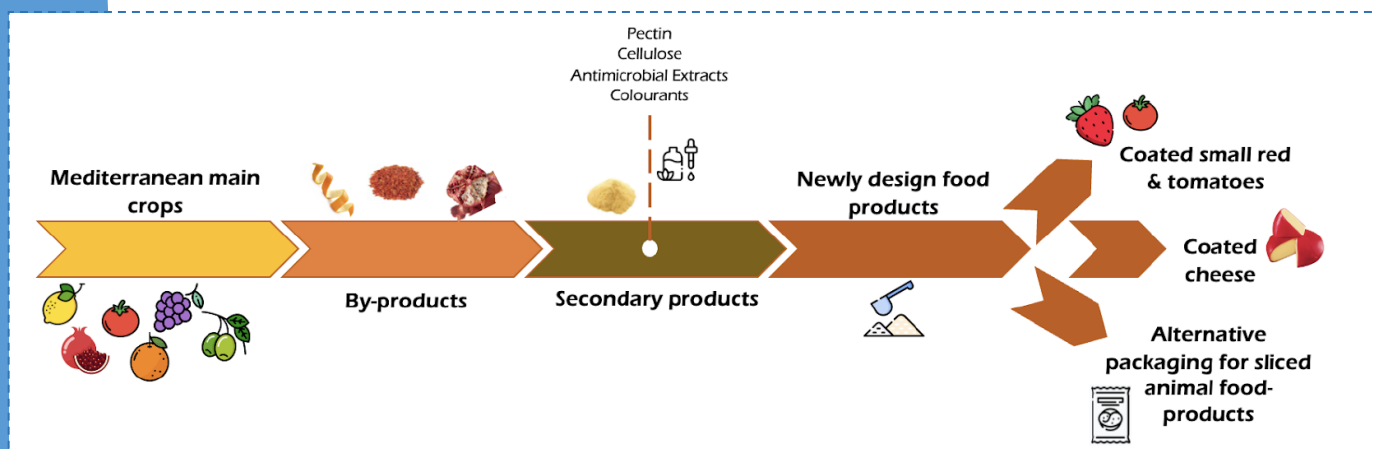


Newsletter nº1 May 2025

The three-year European project "**NOVel Antimicrobial Coatings and PACKaging in the Mediterranean**" (**NOVAPACK**) began in December 2024. This project brings together an interdisciplinary consortium of technology centers, universities, and companies from different Mediterranean countries, all united by the goal of promoting innovative and sustainable solutions in the food sector. The consortium is made up of **Portugal's** Center for Biotechnology and Fine Chemistry (CBQF) at the Catholic University of Portugal, which coordinates the project, and Agrogrin Tech; **Egypt's** National Research Center; **Spain's** National Technological Center for Preservation and Food (CTNC), AIMPLAS, and Eversia; and **Tunisia's** Higher Institute of Applied Biology to Medicine (ISBAM) and Zina Fresh.

NOVAPACK's main objective is to reduce food waste and minimize the use of petroleum-derived plastics by **developing bioactive and biodegradable antimicrobial coatings, films, and packaging**. These innovative products will be made from bioactive extracts obtained from fruit and vegetable by-products generated throughout the food supply chain. The initiative not only seeks to extend the shelf life and ensure the safety of Mediterranean foods, but also to offer sustainable solutions that reduce the environmental impact associated with the use of conventional plastic materials.



Duration: 1/12/2024 till 30/11/2027

Project funded under the Horizon Europe program and the European Regional Development Fund (ERDF).

CONSORTIUM



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Centro Tecnológico
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everything
about packaging



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EU FUNDING



The PRIMA programme is supported and funded under Horizon 2020, the Framework European Union's Programme for Research and Innovation



OBJECTIVES

The main goal is the **development of novel and cost-competitive antimicrobial coatings, films and bio-based packaging based on bio-based and biodegradable products**, to reduce food waste and plastic while improving Mediterranean food products' shelf-life and safety. Specifically, NOVAPACK will develop different extract ranges (e.g., bioactive compounds, soluble polysaccharides, and lignocellulosic materials) through the application of integrative upcycling strategies of F&V losses and by-products, produced at the food supply chain. The extracts with antimicrobial and antifungal activities and antioxidant properties will be used in the development of active food coatings and films, and natural-coloured extracts and pH indicators will functionalize the biodegradable packaging. To develop newly designed food products with enhanced shelf-life, quality and health-related beneficial properties, the bioactive coatings will be applied to the most perishable foods (e.g., strawberries, blueberries, red berries and tomatoes) increasing their resilience to contamination, increasing water retention capacity and increasing food shelf-life.

The biodegradable films and packaging combined with bioactive extracts will be applied to perishable animal products (e.g., sliced cheese and ham) synergistically acting in the reduction of food losses, food spoilage and the use of plastic, leading to better consumer safety features aligned with relevant standards. The objectives of NOVAPACK will be achieved since the consortium gathers a diversified group of leaders that ensures the know-how, engages with key stakeholders (public and private actors) promotes its participatory action and fully addresses the PRIMA Topic 2.3.1- 2023 (RIA) Assessing novel antimicrobial food packaging and coating materials (Section 2).



Manuela Pintado, NOVAPACK's coordinator, in the XII International Symposium on Food Technologies, Murcia 20th May 2025.



DESCRIPTION

The NOVAPACK project can be summarised in the following steps:

- **Extraction and purification** of specific valuable **bioactive compounds** to be used in the development of **active food coatings and films**, and **functionalized packaging**;
- Identification of **bioactive extracts** targeting **antimicrobial** and **antifungal** activities, and **antioxidant** properties;
- Development of **natural colourant extracts** and **pH indicator capabilities**;
- Identification and **extraction of pectin and other soluble polysaccharides** to develop new coating formulations, combined with other alternative and sustainable biopolymers **to produce biodegradable films**;
- Identification of **innovative alternative packaging materials** for the development of **fresh products stored in protective atmosphere packs**;
- Identification of **innovative technologies** (e.g., encapsulation) **to protect the extract bioactivities** to preserve food's nutritional and organoleptic properties.

KICK OFF MEETING

The inaugural meeting of the NOVAPACK project, funded under the PRIMA initiative (PRIMA/0005/2023), was successfully convened on the 6th and 7th of May 2025 at the premises of the Universidade Católica Portuguesa (UCP) in Porto, Portugal.



The meeting concluded with a renewed commitment from all partners to collaborate proactively and ensure the successful execution of the NOVAPACK project. The two-day event not only reinforced the scientific and technical alignment among the consortium but also strengthened interpersonal relationships and strategic cohesion—both essential for delivering impactful, innovative outcomes throughout the project's duration.

TECHNICAL ISSUES

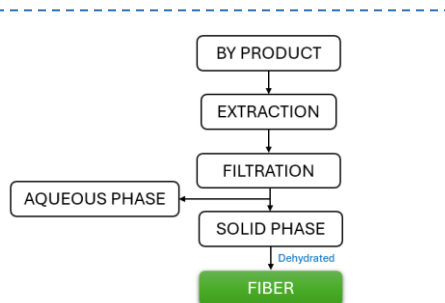
AIMPLAS is involved in 3 work packages: **WP3** in which the role of AIMPLAS is to help and collaborate with **UCP** and **NRC** on the topic of active and edible coatings, **WP7** – focused on communication, dissemination, and exploitation, and finally **WP4** which AIMPLAS coordinate.

This work package is about obtaining formulations based on pectin derived from fruit extracts, which will be provided by our Partners. In the first place, this part will be optimized using a Brabender torque rheometer, and later scaled up with compounding extruders at a pilot scale. The obtained pellets will then be processed into packaging by the Partners in WP5 in the subsequent steps.



Torque Rheometer Brabender

During the first months of the project, **CTNC** focused on characterizing waste streams from the agri-food industry, particularly highlighting the aqueous extraction of lemon peel. This green technology has enabled the obtaining of functional and bioactive extracts, maximizing the use of by-products such as the fiber obtained after filtration and dehydration. In addition, in collaboration with various project partners, biobased materials were developed at laboratory and pilot scale, using these sustainable raw materials. The chemical and functional characterization of the obtained extracts has been essential for validating their use in food applications.



Flow diagram for obtaining fiber-rich extract



*Dehydrated lemon
by-product*

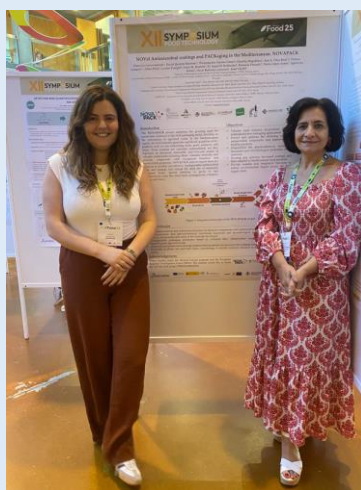
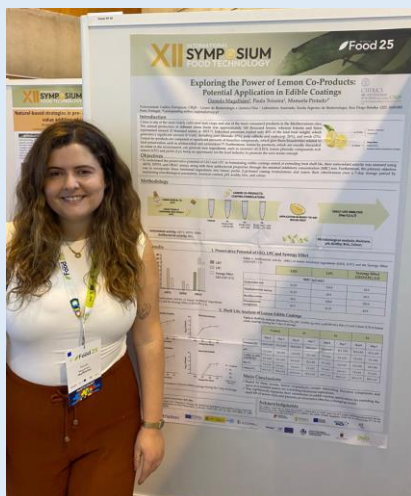


*Fiber-rich extract
from dehydrated
lemon by-product*



DISSEMINATION ACTIVITIES

Poster communications



- Exploring the Power of Lemon Co-Products: Potential Application in Edible Coatings. Daniela Magalhães, Paula Teixeira, Manuela Pintado.
- NOVel Antimicrobial coatings and PACKaging in the Mediterranean (NOVAPACK). Francisco Lorca Salcedo, David Quintín Martínez, Presentación García Gómez, Daniela Magalhães, Ana A. Vilas Boas, Débora Campos, Adma Melo, Lazhar Zourgui, Faten M. Ibrahim, EL Sayed El Habbasha, Nuria López Aznar, Agnieszka Kobus, Oscar Ballesta Caravaca, Amel Chelbi, Manuela Pintado.

XII International Symposium Food Technology (20th May 2025, Murcia, Spain).

Oral communications



- ❖ Ángel Martínez. NOVAPACK project. Final Conference of the Erasmus+ project "SEEDing Successful young female entrepreneurs for a green world by regenerative agriculture – SEEDS", 28th January 2025. INCDBA-IBA Bucharest, Romania.

Oral communications



- ❖ The Egyptian project PI Prof. Faten M. Ibrahim and the Co-PI Prof. Elsayed Elhabbasha who representing NOVAPACK project participated in the event which organized by ASRT (the Egyptian funding agency) on 4 February 2025 for the new Egyptian PRIMA projects which started on 2025, in the presence of PRIMA officer Dr. Mohamed Wageih.

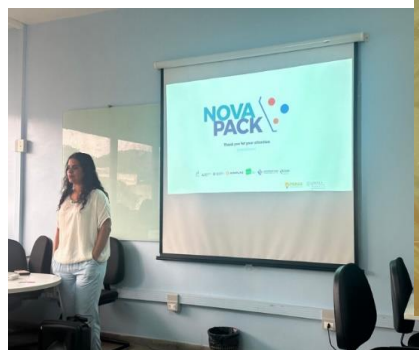
- ❖ On 16 April 2025 Prof. Faten M. Ibrahim (PI) launched NOVAPACK project in Egypt, where she organised a physical meeting for the project members as well as NRC attendances and she gave a presentation about the project WPs, tasks and other activities and divided the project works among the teamwork.



- ❖ On 13 May 2025, Prof. Elsayed Elhabbasha participated in the WEFE Nexus in Egypt and the MENA Region Conference, **Exploring and Bridging Nexus for a Sustainable Future, 13-14 May 2025**, TOLIP Hotel and he gave a small presentation about the NOVAPACK project through his lecture.

Oral communications

- ❖ Hiléia Souza. Are Bioplastics a Good Idea? Guest speaker by the Study Group on Science and Technology Education in Social Contexts (GECTS), within the Postgraduate Program in Science and Mathematics Teaching. **Federal University of Rio Grande do Norte (UFRN).** (15th May 2025, Brazil).



- ❖ Manuela Pintado. NOVEL Antimicrobial coatings and PACKaging in the Mediterranean (NOVAPACK). **XII International Symposium Food Technology.** (20th May 2025, Murcia, Spain).



MURCIA FOOD Brokerage Event



- ❖ NOVAPACK partners held several meetings with other researchers and companies interested in the project's results. These meetings were held in a hybrid format: in-person or virtual.



20th and 21st May 2025. Murcia, Spain.