PRESS RELEASE

MEDIET4ALL Work package 3 – Progress report

Sustainable Food Innovation: Eco-Friendly Packaging Solutions Under Development

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As part of the European research initiative **MEDIET4ALL**, the **Université Bourgogne Europe (UBE)** and its research partners are making significant progress toward creating innovative, sustainable food packaging solutions that support the preservation and shelf-life of modernized Mediterranean meals.

This work is led under **Work Package 3 (WP3)**, coordinated by **Frédéric Debeaufort**, senior researcher in food packaging sciences and professor at UBE. The WP focuses on developing **bio-based, recyclable, and active packaging systems** designed specifically for MEDIET4ALL food products.

A European University Strongly Committed to Sustainability and Food Innovation

With more than **35,000 students**, including **over 1,000 PhD researchers**, **Université Bourgogne Europe** is an international and interdisciplinary institution, coordinating the **FORTHEM European University Alliance**. Within the university, the joint research unit **PAM (Food Processing and Microbiology)** — shared with **Institut Agro Dijon** and **INRAE** — plays a leading role in food science and technology research.

Within PAM, the **PCAV research team** specializes in the physical chemistry of food systems, oxidative stability, food waste valorization, fermentation of plant proteins, and shelf-life performance — including packaging systems.

“Our work aims to understand and optimize the physical, chemical and biological mechanisms that influence food quality — and packaging plays a key role in that equation,” explains **Dr. Debeaufort**.

A Strategic Mission: Sustainable and Functional Packaging for MedMeals

WP3 supports MEDIET4ALL’s ambition to improve dietary habits and sustainability by replacing conventional oil-based plastics with bio-based alternatives.

“Our mission is to develop active, bio-based or recyclable packaging made from marine co-products and enriched with natural extracts to protect Mediterranean meals and extend their shelf-life,” says Dr. Debeaufort.

These new packaging systems are designed with an industrial perspective, using technologies that could be rapidly deployed to market.

Mid-Project Achievements: Materials Selected and Functional Testing Underway

At project midpoint, WP3 has completed:

- Selection of suitable bio-based packaging materials
- Identification of industrial-compatible coating strategies
- Testing of natural antimicrobial and antioxidant extracts supplied by MEDIET4ALL partners
- First applications of the packaging systems on real food products

Multiple prototype films have now been produced and tested, demonstrating promising potential for future implementation.

Scientific and Technical Challenges: A Complex Food Environment

Mediterranean foods pose specific packaging stresses due to moisture, acidity, salt, fats, and bioactivity. These conditions present structural degradation risks for biodegradable materials.

“Because our materials are based on natural resources, water and vapour permeability are key challenges. We are now working on natural protective components to strengthen packaging barriers,” explains Frédéric Debeaufort.

Early Success Stories: From Marine Resources to Industrial-Ready Packaging

WP3 has already achieved two key breakthroughs:

- **Marine co-products as packaging material:** simple compounds such as fish gelatin have been shown to generate efficient and high-quality coatings.
- **Low-energy treatment validated:** the team successfully tested **cold-air plasma technology**, a process that dramatically reduces energy use compared to conventional systems — and is already compatible with industrial scale-up.

Anticipated Impact: Industry First — Consumers Next

While consumer behavioral impact will require market penetration, early indicators show promising industrial applicability.

“We have shown that bioplastics can be successfully used in food packaging if constraints and material-food interactions are well understood,” says Debeaufort.

Collaboration as the Driving Force

WP3 relies heavily on coordination between MEDIET4ALL partners in France, Italy, Spain, and beyond.

- **Palermo partners** provide marine extracts and bio-active compounds
- **University of Valencia** performs real-food validation tests
- **Vitagora** supports dissemination and valorization of scientific outcomes

“Face-to-face interactions are essential. They accelerate decision-making, stimulate innovation, and strengthen cross-disciplinary understanding.”

Next Steps: Scaling Up and Real-Food Validation

Over the coming months, the WP3 team will:

- Produce larger prototype batches
- Transition from model foods to real MedMeals
- Test antibacterial and antioxidant performance under real storage conditions
- Evaluate final prototypes from a safety and shelf-life perspective

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About MEDIET4ALL

MEDIET4ALL is a European initiative aiming to modernize and promote the Mediterranean diet through scientific innovation, culinary excellence, and interdisciplinary collaboration. The project gathers partners from across the Mediterranean basin to develop healthier, sustainable and culturally meaningful food solutions.

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