

# ChitoFOODS

The overall aim of the ChitoFOODs project («Chitosan-based nanoparticles and films loaded with agrifood by-product extracts for novel food

applications») is the integration of circular economy and Green Chemistry towards the valorization of agrifood by-products of Greece, and more specifically of Northern Greece, aiming to the recovery of compounds for the development of novel functional foods, natural food additives (e.g., preservatives, antioxidants) and active food packaging materials. The development of environmental-friendly approaches to produce high-added value compounds is a field of research that has attracted the interest of the scientific community, industry and consumers. The last decades, there is an increasing demand for foods that not only have high nutritional and sensorial quality but also deliver health promoting benefits through certain ingredients, namely “bioactive” or “functional” ones. Moreover, emphasis is given on the production of healthy products without the use of synthetic chemical food additives. Towards this direction and in order to protect both public health and environment, agrifood by-products, generated in large amounts worldwide, can be exploited as a promising source of valuable compounds for novel food applications.

The project is divided into three major objectives. The first one includes the development of eco-friendly, non-conventional extraction methodologies, in line with the Green Chemistry principles, for the recovery of valuable compounds (e.g., phenolic compounds) from by-products of the agrifood industry of Northern Greece. In particular, the project focuses on rice (*Oryza sativa* L.) by-products, namely rice hulls and bran, pomegranate (*Punica granatum* L.) by-products, namely peels and seeds, and peach (*Prunus persica*) by-products, namely peels and kernels. The production of such crops in Greece generates big quantities of by-products and wastes.



The second objective is the development of effective chitosan-based delivery systems for these compounds that offer protection and stability against temperature and pH changes, light, oxygen etc. during processing and storage of food products, controlled and targeted release of the compounds as well increased bioavailability.

The third objective is the incorporation of these delivery systems (a) in various foodstuffs in order to produce novel functional foods and/or to replace, entirely or partially, conventional synthetic food additives and (b) in edible films for the production of intelligent food packaging materials, reinforced with natural antioxidants, antimicrobial agents etc., towards improving food quality and preventing food spoilage.

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