The scientific and technological activity of the ASPA (Analysis and simulation of agri-food processes) group focuses on the development of competitive regional, national and European projects, as well as industrial projects (funded by CDTI and with own funds), in the following research lines and their related applications:

Research Lines	Applications
Simulation and control of agri-food processes.	Analysis of agri-food processes in view of their optimization (energy, product quality, environmental, economic, production ...). For this purpose, the study, design and control of processes is approached through the modeling of operations and simulation using computer tools. It can be applied to all the processes: extraction, drying, microbial inactivation, etc...
Drying processes and quality of dehydrated products	Use of conventional techniques and application of new technologies (ultrasound, high intensity electric pulses, moderate electric fields and supercritical CO_2), as well as modeling and optimization of processes, to improve the following applications: Drying at high (hot air drying) and low (atmospheric and vacuum freeze drying) temperature. Drying Optimization of solid and semi-solid (purees, pastes, etc..) agri-food (vegetables, fish, meat, by-products, …) chemical and pharmaceutical products. Use of new technologies for improving process sustainability (reduction of temperature, shortening of time, reduction of energy consumption..) and product quality (bioactive compounds, fiber, vitamins, etc…)
Efficient and sustainable extraction processes	Use of conventional techniques and application of new technologies (ultrasound, high intensity electric pulses, moderate electric fields and supercritical CO_2), as well as modeling and optimization of processes, to improve the following applications: Extraction of bioactive compounds (antioxidants, antimicrobial, anticancer, colorants…) from plants, algae, marine invertebrates and industrial by-products for food, chemical, pharma and cosmetic uses. Extraction of unwanted compounds (purification) from food and pharma products. Extraction and purification of plant-based proteins (lupine, chickpea, soybean…). Extraction of reducing sugars to reduce acrylamide formation. Enhancement of fruit juice and soya/almond/tigernut milk extraction.
Non-destructive and non-invasive analysis of agri-food products and processes	Implementation of fast, robust and highly reliable inspection systems, based on ultrasound, with or without contact (air-coupled) with the sample, which allow the following objectives to be achieved: Non-destructive or non-invasive analysis of the composition (fat, protein, water), fat crystallization behavior, texture, structure and presence of foreign bodies (plastic, glass, metal) in agri-food products (meat, fish, bakery, fats and oils…). Real-time analysis and monitoring. Applications on Industry 4.0.
Non-thermal pasteurization and sterilization processes	Use of new technologies (ultrasound, high intensity electric pulses, moderate electric fields and supercritical CO_2), as well as modeling and optimization of processes, for the development of the following applications: Non-thermal pasteurization and sterilization by microbial and enzyme inactivation in food (juices, meat), pharmaceutical (emulsions) and cosmetic (emulsions) products.
Environmental footprint and sustainability assessment of agri-food systems	Carbon footprint and environmental footprint (LCA) of agri-food systems Multicriteria assessment of products and processes, integrating criteria such as environmental (including carbon footprint), economic, nutritional, etc. Environmental assessment of the consequences of policies, adoption of new technologies, etc.

More information about the scientific background of the group can be found at: http://www.upv.es/contenidos/INVESDTA/menu_urlc.html?//www.upv.es/contenidos/INVESDTA/info/U0834584.pdf

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