



CEREAL

EU agricultural industry sustainability depends to a major extent on its capability to introduce new, ready-to-eat fresh and composite fruit and vegetable products. This, in turn, requires significant improvement in produce cleaning and packaging technologies to ensure food quality and safety, reduced input of water/energy and enhancing waste recyclability. Fresh-cut vegetables and fruit present stringent challenges due to their intrinsic perishability. The loss due to microbiological spoilage is a major concern in a market focused on international trade. Proper disinfection technology is required to ensure microbial safety avoiding at the same time the formation of disinfection by-products such as chlorinated chemicals.

The quality of fresh-cut products also depends critically on packaging technology, which has to preserve good appearance and flavour, as well as meet safety requirements. The improvements in resource efficiency will be achieved by exploring solutions provided by advances in nanotechnology. Specifically design of membrane operations aimed at reducing the dose of disinfectant agents and saving water by improving recyclability. A new generation of ultrafiltration membranes including biocidal functionalization with the aim of limiting biofouling and controlling the level of pathogens in process water will be designed. The incorporation of nanoparticle-based active coatings in ceramic modules is intended to allow operation under strong oxidizing conditions provided by ozone. For it, ozone is to be produced by pulsed corona discharge, which is an energy efficient process. The use of nanotechnology to improve packaging by reducing the amount of raw polymers as well as costs for transportation, storage and recycling is also to be addressed. Residues from food processing will be used to produce nanocellulose. The evaluation of these new approaches will be performed using environmental and economic life-cycle assessment according to International Standards.