

# SUSTAINABLE CLEANING AND DISINFECTION OF FRESH-CUT PRODUCTS: OVERVIEW ON MAIN ADVANCES OF THE FP7 SUSCLEAN PROJECT

Thierry Bénézech<sup>1\*</sup>, Eelco Franz<sup>2</sup>, Wolfgang Augustin<sup>3</sup>, Luis Melo<sup>4</sup>, Alfredo Rodrigo<sup>5</sup>, Andras Sebock<sup>6</sup>, Olga Mackre<sup>7</sup> & John Holah<sup>8</sup>

<sup>1</sup>*Interfacial Processes and Material Hygiene, INRA, Box 20039, France*

<sup>2</sup>*RIVM – Centre for Infectious Disease Control, Antonie van Leeuwenhoeklaan 9, 3721 MA Bilthoven, The Netherlands*

<sup>3</sup>*Technische Universität Braunschweig, Germany*

<sup>4</sup>*Universidade do Porto, Portugal*

<sup>5</sup>*Association de Investigación de la Industria Agroalimentaria, Spain*

<sup>6</sup>*Campden BRI Magyarország, Hungary*

<sup>7</sup>*Inra Transfert, France*

<sup>8</sup>*Campden BRI, UK*

## ABSTRACT

*The SUSCLEAN project (21 partners, 12 small and medium enterprises, 8 European countries) aims to mitigate water and chlorine consumption in the fresh-cut food industry, whilst optimizing environmental sustainability, food quality and food safety. Chlorine is widely used in the fresh-cut industry, although a few countries, for example the Netherlands, have forbidden its use for health and environmental concerns. Indeed, the association of chlorine with the possible formation of carcinogenic chlorinated compounds in water has called into question the general use of chlorine in food processing. The other challenge for the Minimally Processed Vegetable (MPV) industry is the reduction of water consumption and wastewater discharge rates, which is considered as significant nowadays.*

*Although disinfection of wash water and cleaning of equipment (sanitation) is an effective way to ensure product safety in the MPV industry, some potential pitfalls and risks can be associated. For a better understanding of these mechanisms the SUSCLEAN project started with two microbial sampling campaigns at two different MPV production sites to assess critical points for (re)contamination of equipment and product. Isolates obtained were typed and their capability for biofilm formation was assessed using confocal laser scanning microscope. In parallel, the development of rapid onsite microbial detection methods is very promising and a method is now under testing at production sites.*

*Improvement of equipment hygienic design will minimize the levels of resident microbial flora and requires knowledge of how surface geometries and material properties play a key role in the microbial contamination route and persistence. Insight into the state of the art of salad processing machines was achieved.*

*The project proposes a disruptive approach by means of the use of methods and techniques rarely applied in the MPV industries, including chemicals and physical treatments to remove and control biofilms. A list of possible alternative disinfection (water), sanitation (equipment) and decontamination (product) strategies was established and published on our website ([www.susclean.eu](http://www.susclean.eu)). The project also proposes an incremental approach to reduce the use of chlorine and water. In parallel, organoleptic investigations of salads treated with chemical*

*decontamination methods are being conducted. Characterization of water consumption and wastewater generation patterns (volumes, chemical and microbiological characterization) for sanitation and water disinfection was carried out in the industrial partner's production site. To consider the impact of the proposed sanitation and decontamination strategies in line with the Directive on Integrated Pollution Prevention Control (IPPC) 2008/1/CE, relevant parameters have been defined for the LCA (Life Cycle Assessment) and BAT (Best Available Techniques).*