

## **A survey of the microbiota associated with Ready-to-Eat mixed salads from field to retail**

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Food of non-animal origin is a major component of the human diet and has been considered to pose a low risk regarding bacteriological safety. However, the numbers of outbreaks caused by food borne pathogens linked to the consumption of fresh vegetables have increased around the world. Among these, *Salmonella* spp., STEC (Shiga toxin-producing *Escherichia coli*) and *Listeria monocytogenes* are the most frequently identified causative pathogens. Food processors, especially those who produce ready-to-eat (RTE) products like mixed salads, need to be vigilant of these pathogenic bacteria. This work aimed to determine the occurrence of human pathogens and the diversity of microbiota in a traditional mixed salad processing facility over twelve months. A total of 861 samples, including 734 environmental samples (swabs, contact plates, water- and air samples) and 127 product samples along the chain from field to retail were collected and investigated. Only 4 of 734 environmental samples were positive for *L. monocytogenes* (serovar IVb and IIb) and 2 were positive for enteropathogenic *E. coli* (O63:H6 and O96:H7). *Salmonella* serovars and shiga toxin-producing *E. coli* (O146:[H28]) or *Listeria monocytogenes* (serovar IVb and IIb). The second aim of this study was to determine possible influences of the processing environment on the initial microbiota of fresh cut salad. For this, the microbiota of three different salads (*Lactuca sativa* var. *longifolia*, *Cichorium endivia* and *Lactuca sativa* var. *crispa*) was analyzed by next generation, 16S Amplicon sequencing of samples from the production process on the field, or taken during storage, processing and after packaging. The 16S rRNA gene sequencing analysis of the microbiota showed that core microbiota was shared by most of the samples and included *Proteobacteria* (47-91 %), *Firmicutes* (1-20 %), *Bacteroidetes* (2-19 %) and *Actinobacteria* (5-22 %). Moreover, the microbiota was unique for the different salad plants and stable after storage and processing (cutting away of the outer leaves). Nevertheless, the washing process significantly changed the composition of microbiota with a shift to pseudomonads. Our findings indicate that only low levels of pathogens were detected in the food chain of RTE mixed salads during harvesting, processing and distribution. Moreover, our results of microbiota analyses highlighted the impact of washing water for the composition of microbiota at retail level.