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Food traceability: How microbial ecology can help

Jean-Christophe Meile CIRAD-UMR Qualisud, France

The Food Law (European regulation CE No.178/2002), applied since January 2005, imposes to all food processing companies of the European Union (EU) to keep consumers informed about the nature of the product and any sanitary problems. Moreover, it imposes the traceability of foodstuffs at all steps of the food production. However, there is, at the moment, no real analytical tool for food traceability allowing authentication of the product origin or the farming type in a simple, fast and inexpensive way. The skin of fresh foods (vegetables, fruits) carries microbial communities that vary according to environmental parameters (soil, plant variety and physiology). Previous works showed that there is a link between the geographical origin of food and the structure of the microbial communities of fish, fruits and marine salts. This was performed using a method based on the extraction, PCR amplification and profiling of microbial DNA regions to study bacterial and fungal communities. Evidences suggest that there is a specific signature of food origin at the microbial ecology level that can be determined by molecular techniques. Appropriate statistical methods applied to molecular signatures comparison can help reveal significant differences between samples. From these data could be extracted markers that are specific of a region or a mode of production. For example, recent work using this approach showed that, it was possible to distinguish between organic from conventional fruits. Following the presentation of several studies their potential use for fraud detection and authentication controls in food will be discussed.

Biography

Jean-Christophe Meile has completed his PhD in Molecular Genetics in 2006 from Paris-Orsay University and Postdoctoral studies from CNRS at University of Toulouse, France. In 2011, he has joined the Qualisud (Integrated Approach to Food Quality) research unit of CIRAD. His research activities focus on the development of molecular methods in food microbiology for food safety and traceability. He has published about 15 papers in peer-reviewed journals.

jean-christophe.meile@cirad.fr

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