Mass spectrometry and various shades of food fraud

Saskia M. van Ruth[1], Valentina Acierno[1], Ningjing Liu[1], Isabelle Silvis[1], Jing Yan[1]

1. Wageningen University and Research, P.O. Box 17, 6700 AA Wageningen, the Netherlands.
Email: saskia.vanruth@wur.nl

Prof. Saskia van Ruth heads research on food authenticity at Wageningen University and Research in the Netherlands since 2005. She also teaches on the topic as professor in Wageningen and in University College Cork in Ireland. She received her PhD in Food Chemistry from the Wageningen University in 1995 and worked for industry and in the academic world since. Her present research deals with fraud risks, i.e. factors impacting on the risk of food fraud in supply chain networks. Furthermore, she is active in research on novel methodology for fraud detection, both in and beyond the laboratory.

Abstract:

Food fraud is a form of criminal behaviour, no matter the definition of crime. Its consequences are devastating. The interaction between motivated offenders, and the opportunities presented by victims and lack of control measures favour occurrence of food fraud. Control measures help to counteract fraud opportunities and motivations. Analytical testing is one of those control measures. Traditional measurements have focused on the analysis of one or a few product characteristics. However, nowadays analytical techniques generating detailed analytical fingerprints are used to determine the identity of foods, and we have many spectrometry techniques available. Sensitive targeted methods will be presented, for instance for authentication of olive oil grades, as well as various fingerprint approaches. They include for instance broad anomaly methodology for authentication of spices, as well as for the characterization of organic products. Furthermore, MS-based breath analysis will demonstrate the importance of the origin of cocoa beans for a distinct identity of chocolates.