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Can food safety be ensured by a non-targeted metabolomics approach?

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Food safety is an area of concern because of the vulnerability of the food chain in the ongoing globalization of food production. Unwanted and unexpected contaminating substances can enter the food chain through use of inadequate raw materials, malfunctioning equipment or procedures, intentional use of illegitimate additives, migration from packaging or sabotage. Within the current food safety paradigm it is difficult to discover contamination by substances that are not on the lists of controlled substances. A non-targeted metabolomics approach screening small molecules with liquid chromatography coupled to full-scan mass spectrometry (LC/MS) is seems ideal to complement the analytical measurements performed today to ensure the safety of our food. Proof-of-principle studies with milk and orange juices show that it is possible to detect the presence of unexpected contaminants at levels well below acute toxicity using a combination of uni- and multivariate data analysis. Metabolomics data can also be used to assess the species used in food production, for instance in the meat in meat balls or lasagna. Issues with calibration transfer and normal variation need to be addressed before a large scale application of a metabolomics approach can be successful. Completely safe food is difficult or even impossible to ensure. A metabolomics approach can complement the existing food safety measurements to make our food safer.

Biography

K Magnus Aberg has completed his PhD at the age of 28 years from Stockholm University, Sweden, and postdoctoral studies from Novo Nordisk A/S in Denmark. He is the leader of a research group in chemometrics specializing in analysis of metabolomics data from LC/MS and NMR. He has published more than 20 papers in reputed journals and has been serving as a guest editor of *Journal of Chemometrics*.

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