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Fingerprint concept in context of Food Safety and Biosecurity

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Abstract: Accelerated growth of food supply and mobility, an effect of globalisation, is a main food security and biosecurity issue. Specialized studies confirm that causal determinants of fingerprinting are geographical and genetic origin. Biosecurity problems can be solved by "elementary" fingerprinting (chemical individuals), regarding discrimination of geographical origin, organic/conventional production (Fig. 1). Indicators for assessing the impact of agricultural practices, processing and/or storage on chemical/sensory composition, identification of new bioactive compounds, food fingerprint generators. In response, new approaches from perspective of molecular biology, enzymology (e.g. genomics, proteomics, metabolomics ((fingerprinting markers))), "come to rescue" and complement classical fingerprinting methodologies for verifying claims about the origin and nutritional availability of a food. In the last decade, proteomics (= analysis/identification of proteins as fingerprint markers, from a defined biological system) has been applied to various research areas in area of food technologies. Since proteins can be used as markers for a wide range of food attributes, "signalling point transformations" induced by processing operations, they can be additional evidence of food safety/biosecurity [1, 2, 3].



FIG. 1. Interrelation fingerprint-food safety and biosecurity

• Conclusions

Currently, it is almost impossible to identify and guarantee the true origin of structural components of food. Development of new bioinformatics tools for fingerprinting the food matrix will play a decisive role in ensuring food safety and biosecurity from a consumption perspective.

• Reference

1. Laursen, K.H. et al., 2014, Authentication of organically grown plants - advantages and limitations of atomic spectroscopy for multi-element and stable isotope analysis, Trends Anal Chem., 59, p. 73-82.
2. Pandey, A., Mann, M., 2000, Proteomics to study genes and genomes, Nature, 405, p. 837-846.
3. Cubero-Leon, E. et al., 2014, Review on metabolomics for food authentication, Food Res. Int., 60, p. 95-107.

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