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Food fraud and food authenticity – analytical choices and limitations

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European and global food policies require that food put on the market is authentic, which means that the label declaration matches the composition and provenance of the food item. This is also a justified expectation of the consumers. But on the other hand, food fraud is a profitable market and adulteration of food has become more sophisticated. Food adulteration reports are a growing challenge for food manufacturers. Because most adulterants are unknown, they are difficult to recognize using the targeted screening methods typically used in food laboratories. Methods that will screen non-targeted food samples concerning authenticity markers are currently used and investigated to provide proof of origin and prevent deliberate or accidental undeclared admixture to food. The solution to these problems seems to be so-called food fingerprints analysis. These applications are usually based on spectroscopic and spectrometric data providing the capability for a comprehensive characterization of the investigated matrices. But also other analytical techniques are used, such as PCR and NGS. These methods provide a high potential with regard to the characterization and identity verification of food. But which method is suitable for which food matrix and for which analytical question. What are the limitations? Are results comparable between different laboratories? Doubts are already arising, if the problem of food authenticity can be solved in the laboratories. A further problem, which needs to be solved, is authentic food for the fingerprint comparison. As food adulteration reports are a growing challenge for all stake holders on the food market, a set of analytical techniques is entering the scene. But these methods have strengths and weaknesses that are not plain on first sight, especially to the non-analytical experts.

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