

Elements and their chemical species in food – recent developments from analytics in support of quality and risk assessment

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Confidence in the quality and safety of food is a high priority worldwide. The presence of undesired chemicals as well as the lack of essential chemical substances to fulfill the dietary requirement can potentially lead to serious consequences for human health. The trace elements have their own place in this context with some elements being essential to humans and other very harmful. When assessing the quality and/or safety of foods there is a demand for reliable information and providing results which are fit-for-the-purpose to enable correct assessment of quality and/or safety.

Trace element speciation analysis has been among the most important research topics within the field of trace element analysis over the last decades. Food samples are comprised of a high variety of chemical compounds from which many can interact with the elements and form complex elemental species with various influence on the human body. In order to achieve the full picture it is important not only to determine the total amount of a certain trace element present in the food sample but also to identify the chemical form in which given element occurs in given sample (i.e. its speciation). Selected examples on trace element speciation will be presented with a focus on development and application of methods aiming at control of food safety aspects.

DTU FOOD has since 2018 been hosting the European Reference Laboratory for metals and nitrogenous compounds in feed and food (EURL-MN). The EURL-MN collaborates closely with the network of NRLs (National Reference Laboratories) in the EU members states and organises proficiency tests, workshops and training for the NRL with the aim of harmonising and increasing the analytical competences of the laboratories involved in official food control of trace elements. An important player here is also the European Standardisation Committee (CEN) and the Working group 10 on Elements and their chemical species in Food, which develops standardised methods and procedures for analysis of trace elements in food. An update on the recent activities within the EURL-MN and CEN standardisation work will be presented.

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