Challenges of food contaminant analysis: key role of certified reference materials

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Food contaminants are chemical substances (e.g. polycyclic aromatic hydrocarbons, pesticides, dioxins, PCBs, heavy metals) or biological materials (e.g. viruses, bacteria, fungi) that can be harmful to humans. These contaminants can enter the food or form in it during production, processing, storage or transportation, through contact with packaging materials and manufacturing devices, as well as through contamination from the environment. In addition, they can also have their origin from natural sources (natural toxins) or can even be added intentionally (food fraud).

The large number of possible contaminants and the presence of these contaminants in a wide variety of food matrices over a wide range of concentrations pose significant challenges to analytical methods. To address these challenges, a national competence center for chemical and biological analyses in the field of food safety and nutrition is being established at METAS. We currently operate a total of four national reference laboratories (NRLs) in the area of food analysis and perform chemical and biological analyses in food monitoring and population biomonitoring studies. We ensure, through traceable measurement procedures and certified reference materials, that the results of potential hazards from contaminants in food are valid and comparable worldwide.

In this talk, an overview of challenges in the analytics of food contaminants based on current projects at METAS is given. A concrete example for the analysis of polycyclic aromatic hydrocarbons (PAHs) is used to show that the availability of certified reference materials is of central importance in food analysis in order to guarantee the validity of measurement results.