Indicators and sensor technology for the identification of mycotoxine producing fungi in the processing of grain

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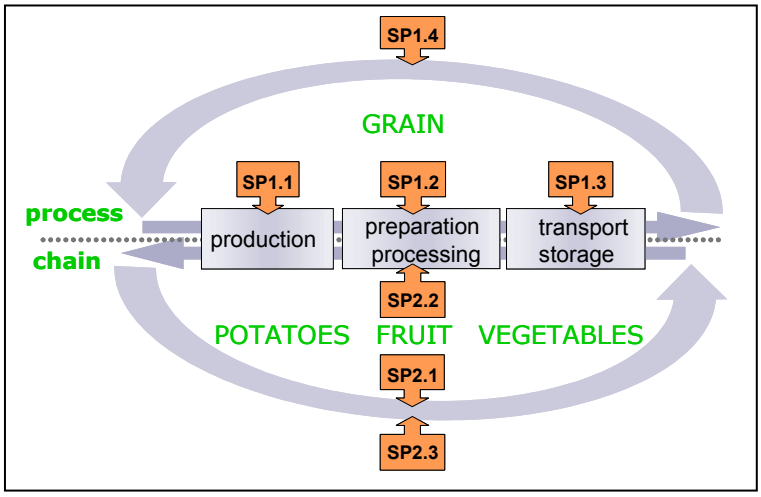
The German Ministry of Education and Research (BMBF) will provide funding of more than 1.9 millions Euro for a large joint project on the development of innovative sensor-based techniques and processes in the field of food quality and safety. In this research-project "*Exploration of sustainability potentials by use of sensor-based technologies and integrated assessment models in the production chain of plant related food*" 13 partners from universities, non-university institutions and industry will cooperate within the projects The expected results shall contribute to maintain freshness and improve safety of produce.



In one of the seven sub-project (SP 1.2) -*Indicators and sensor technology for the identification of mycotoxine producing fungi in the processing of grain*- will be tested spectroscopic methods for the detection on moulds and/or mycotoxins.

Therefore laser-induced fluorescence (LIF), diffuse reflection (DR) spectroscopy as well as ion mobility (IM)spectrometry will be estimated and applied for the detection of mycotoxin contaminations on grain, e.g., in storage facilities, during loading, or before processing. In order to evaluate the capabilities of each method basic parameters are determined first for model systems and in a subsequent step for real samples.

Topics of the project are:

- Spectral range for DR spectroscopy (UV – NIR range) and characterization of suitable absorption and reflection bands for the recognition of mycotoxin contaminats on grain.
- Excitation and emission settings in LIF for the detection of mycotoxin contamination, either of the mycotoxins or fungi, respectively. The application of time-resolved detection schemes is tested in order to minimize the possible influence of signals originating from the complex background matrix.
- Characterization of potential application of IM spectroscopy for the detection of mycotoxin contamination in dust/air of grain storage and processing facilities.
- Possibilities of locally resolved detection schemes e.g., for storage facilities are evaluated e.g., in combination with fibre optics.
- Determination of the limit of detection (LOD) for DR spectroscopy, LIF, and IM spectrometry.

Selectivity, sensitivity, and cross sensitivity are characterized for the different spectroscopic methods. For data evaluation advanced algorithms are developed. The ultimate goal is to built a mobile spectrometer system for the detection of mycotoxin contamination that can be used in-situ directly at the storage and processing facilities.